The Predictive Validity of Sexual Offender Recidivism with a General Risk/Needs Assessment Inventory

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Executive Summary

The Level of Service Inventory – Ontario Revision (LSI-OR; Andrews, Bonta & Wormith, 1995) is a fourth generation risk assessment tool that goes beyond the traditional risk/needs assessment by including other clinically relevant factors and incorporating a case management portion. The instrument includes a general risk/need section consisting of 43 items each of which is scored in a dichotomous fashion (0 = not present or 1 = present). The items are organized into the central eight (Andrews & Bonta, 2010) subscales: criminal history (8 items), education/employment (9 items), family/marital (4 items), leisure/recreation (2 items), companions (4 items), procriminal attitude/orientation (4 items), substance abuse (8 items), and antisocial pattern (4 items).

These items are totalled to create eight domain scores and a total general risk/need score, which is then used to determine the offender's initial risk level on a five-point ordinal scale ranging from very low risk to very high risk. The initial risk level may be overridden in either direction (i.e., from a lower to higher risk level or from a higher to a lower risk level) to create a final risk level. The general risk/needs score has demonstrated predictive validity for general offenders and sex offenders for any recidivism ($r = .39$ and $.41$, respectively) and for violent recidivism, which includes sexual recidivism ($r = .28$ and $.31$, respectively; Girard & Wormith, 2004).

This study examined the applicability of the LSI-OR on sexual offenders. It did so by comparing the predictive validity of the instrument over an average follow-up of 3.8 years, on a large cohort of Ontario provincial sexual offenders and compared the results of these validities to those from the balance of the cohort, the nonsexual offenders. The predictive validity of individual items in the context of the current investigation was also explored as was the role of structured professional judgement (SPJ) in augmenting the risk/need assessment and the occasions of its usage. Thus main purpose of the current study was to examine whether or not the LSI-OR would predict recidivism among sexual offenders, and how the predictive validity of the instrument was affected by the use of the override feature.

The sample was derived from a cohort of offenders who were under the responsibility of the Province of Ontario, Canada. The original cohort included all male and female offenders who, during one calendar year (2004), were released from Ontario provincial correctional facilities after serving a sentence of at least one month,[1] were sentenced to a conditional sentence (to be served in the community), or began a term of probation with the MCSCS. The sample consisted of all offenders in the cohort who had been administered an LSI-OR in conjunction with their sentence. The sexual offender sample was made up of 1,905 sex offenders, and the nonsex offender sample was made up of 24,545.

Analyses conducted included correlational analyses, chi-square analyses, multiple regression, Receiver Operating Characteristic (ROC) analysis, and survival analysis. In terms of basic demographic information, sexual offenders were significantly older than nonsexual offenders and more likely to be male and Aboriginal. In addition, sex offenders had a higher index offense

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[1] In Canada, all offenders who are sentenced to less than two years are placed under provincial responsibility.

severity score, higher scores on all LSI-OR summary measures (except strengths, on which they scored significantly lower) and scored higher on the measure of risk level change indicating that assessors used the override feature to increase their risk level significantly more that they did for nonsexual offenders.

At the end of the follow-up period, more sex offenders had recidivated (44.41%) than nonsex offenders (33.86%) in terms of general recidivism, $t (2180.55) = -8.96, p < .001$. There were no significant differences between sex offenders and nonsex offenders on rates of violent or sexual recidivism. Scores on all LSI-OR subscales were significantly correlated to general, violent and sexual recidivism as measured by binary outcome variables (yes/no).

In terms of recidivism, sexual offenders had a higher rate of general reoffending than nonsexual offenders, and for those sex offenders who did reoffend, they did so more quickly. There was no difference between groups in terms of their violent reoffending and their sexual reoffending. In looking at the relationship between the LSI-OR and recidivism, the general risk/needs score was highly correlated with general recidivism ($r = .44, p < .001$) on the full sample and even more highly on the sexual offender sample ($r = .47, p < .001$). Correlations on the full sample were lower for the prediction of violent recidivism ($r = .29, p < .001$) and even more so for sexual recidivism ($r = .19, p < .001$) with no discernable difference in the predictive validity for sexual offenders.

Receiver Operating Characteristics (ROC Curves) were used to further examine the predictive accuracy of the LSI-OR, with Area Under the Curve (AUC) values ranging from 0.50 (equal to chance prediction) to 1.00 (perfect prediction). In the present study, there was an AUC = .76 for all offenders on sexual recidivism and virtually the same predictive ROC for sexual offenders (AUC = .77) and nonsexual offenders (AUC = .75). Interpreted, an AUC of .76 means that a randomly selected recidivists score higher on the LSI-OR than randomly selected non-recidivists 76% of the time.

In addition to examining rates of recidivism, it is also important to examine the time to recidivate. To this end, Kaplan-Meier survival analyses (Kaplan & Meier, 1958) were conducted in order to provide a more rigorous test of the predictive validity of the LSI-OR with sex offenders and nonsex offenders. In all cases, survival curves varied systematically, and in the expected direction, with risk level.

Correlations between all items found in each section of the LSI-OR were examined for similarities and differences between sex offenders and nonsex offenders. Not only were there a number of highly significant item correlations with general recidivism for the sexual offender sample, correlations were often even higher than the corresponding correlations for nonsexual offenders.

A number of analyses were performed to determine when the override was used and how its use impacted on the predictive validity of the instrument. Both the correlations and the AUC values were routinely higher for the initial risk level than for the final (override) risk levels in the prediction of general, violent and sexual recidivism on the complete sample. These differences

become more pronounced when applied to sexual offenders, indicating that the use of the override appears to be detrimental to the prediction of sexual offender recidivism.

In an effort to determine what may have contributed to the decrement in predictive validity with the use of the override function, the relationship between the risk category change score and a number of demographic and LSI-OR variables was examined using a series of multiple regressions. These results were most revealing in that variables that contributed incrementally, beyond the general risk/need score, to the predicted recidivism were frequently not the same as those that contributed incrementally, beyond the general risk/need score, to the use of the override and vice versa.

All of the above analyses support the use of the LS family of instruments on sexual offenders as demonstrated through the predictive validity correlations and AUC values. Consequently, sexual offenders should not be perceived or treated as being completely distinct from the general offender population. Rather, they have many of the same risks and criminogenic needs as nonsexual offender and therefore can be evaluated on the same general risk/need assessments as nonsexual offenders.

Secondly, the use of the override produced a slight deterioration in the instrument's predictive validity. Therefore, caution, more specific guidelines pertaining to its use, and a policy that requires a written justification for its use on any individual case are recommended. Hopefully, these results will encourage assessors to be more cognizant of the impact of their assessments and provide appropriate rationale for applying an override. In terms of next steps, additional research is recommended, especially on the override or use of professional judgment to augment statistical/empirical based prediction.

**The Predictive Validity of Sexual Offender Recidivism
with a General Risk/Needs Assessment Inventory**

Introduction

The last decade has witnessed tremendous progress in the assessment of sexual offenders' risk to the community. This includes both the proliferation of specialized sexual offender risk assessment instruments [e.g., Rapid Risk Assessment for Sex Offense Recidivism (RRASOR, Hanson, 1997), STATIC-99 (Hanson & Thornton, 2000), Sex Offender Need Assessment Rating (SONAR; Hanson & Harris, 2000a), STABLE (Hanson, Harris, Scott & Helmus, 2007), ACUTE (Hanson, Harris, Scott & Helmus, 2007), Risk Matrix 2000 - Sexual (Thornton et al., 2003), Rapid Risk Assessment of Sexual Offense Recidivism (RRASOR; Hanson, 1997), Minnesota Sex Offender Screening Tool-Revised (MnSOST; Epperson, Kaul & Huot, 1995), Sex Offender Risk Appraisal Guide (SORAG ; Quinsey, Harris, Rice & Cormier, 2006), Sexual Violence Risk-20 (SVR–20; Boer, Hart, Kropp & Webster, 1997), Structured Anchored Clinical Judgment Scale-Minimum (SACJ-Min; see Hanson & Thornton, 2000), and the Violence Risk Scale: Sex Offender version (VRS:SO; Olver, Wong, Nicholaichuk & Gordon, 2007)] and the predictive validity research that investigates individual scales and compares them (e.g., Barbaree, Langton & Peacock, 2006; Craig, Browne & Stringer, 2004; Dempster, 1998; Gentry, Dulmus, & Theriot, 2005; Hanson & Thornton, 2000; Harris, Rice, Quinsey, Lalumière, Boer, & Lang, 2003; Yang, Wong, & Coid, 2010).

Interestingly, some of the comparative studies included general risk assessment tools even though the primary interest was in the predictive validity of sexual recidivism by sexual offenders (e.g. Gretton, McBride, Hare, O'Shaughnessy, & Kumka, 2001; Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2009; Hanson & Thornton, 2000; Parent, Guay & Knight, 2011). In part, this strategy was probably driven by findings that sexual offenders as a group have been found to recidivate at a considerably higher rate for nonsexual offenses, including violent and property offenses, than they do for sexual offenses. For example, differing recidivism rates have been as high as 27% for sexual reoffending (Harris & Hanson, 2004), 14.3% for nonsexual violent reoffending (Hanson & Morton-Bourgon, 2005), and 52% for any reoffending (Prentky, Lee, Knight & Cerce, 1997). However, these comparisons can be misleading as they are based on differing follow-up times and data sources for identification of recidivists (e.g., Hanson & Morton-Bourgon, 2005 arrived at their estimate through a review of 82 recidivism studies with an average follow-up time of 5-6 years; Harris and Hanson (2004) recorded to a maximum of a 15-year follow-up of male sex offenders, while Prentky et al. (1997) had a maximum 25 year follow-up). Regardless, it may prove enlightening to examine the predictive validity of general risk/need assessment schemes with sexual offenders in more detail. The purpose of this paper is to explore the predictive validity of a widely used risk/need assessment instrument (Level of Service/Case Management Inventory: LS/CMI) on a large cohort of sexual offenders.

The Debate about the Application of General Risk/Need Assessment to Sexual Offenders

Opinions about the use of general risk assessment tools with sexual offenders are strongly divided with two clearly defined camps having emerged over the last decade. Differing views can be found between individuals (clinicians and researchers) as well as organizations (correctional agencies and professional associations). Understandably then, individual practices and organizational policies differ quite dramatically between correctional and forensic settings around the world. Assessors in each setting must weigh the costs associated with risk assessment

decision by balancing false negatives with false positives or personal freedom with public safety (Vrieze & Grove, 2007). Ultimately, the purpose of the risk assessment and values professed by the agents and setting in which the assessment is performed determine the extent to which these two types of error are weighed.

It is commonly argued that general (static) risk and even risk/need assessments tools such as LS are not helpful in the assessment of sexual offenders or in the prediction of their further antisocial behaviour, particularly their sexual re-offending. Some professionals have gone so far as to assert that such tools should explicitly not be employed with sexual offenders because the assessment results are at best misleading and at worst categorically wrong. Three interrelated kinds of reasons are typically offered for rejecting the use of general risk and risk/need assessment tools in the assessment of sexual offenders.

Much of the rationale comes from the position that general risk or risk/need assessment instruments do not tap into the element of sexual deviance, which is a key indicator of sexual offending and recidivism. This has, indeed, been demonstrated to be an important predictor, perhaps the best, of sexual recidivism among sexual offenders. Hanson and colleagues (Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2005, 2009) in a series of comprehensive meta-analyses of sex offender risk factors found unequivocal evidence for the power of sexual deviation as a key predictor of sexual recidivism. Specifically, sexual deviancy was more strongly related to sexual recidivism than six other types of variables including antisocial orientation and sexual attitudes, although it was not significantly correlated with nonsexual violent recidivism or any recidivism (Hanson and Morton-Bourgon, 2005).

The second argument is that general risk and risk/need assessment instruments attend to risk factors that are essentially superfluous for the assessment of sexual offenders. This presumed list of risk/need factors includes both static items such as criminal history because it is assumed that sexual offenders are not "garden variety" criminals with the traditional list of property, violation and compliance offenses and even violent offenses that characterize the traditional career criminal. Similarly, it is asserted that they tend not to exhibit the traditional criminogenic needs, such as an impoverished education and employment, a strong mix of criminal as opposed to noncriminal companions, and clearly evident criminal attitudes, all of which are found in the very needy common offender. Frequently, these arguments focus on incest offenders, describing what would appear to be well adjusted prosocial individuals who are integrated into the mainstream society in order to illustrate their point, at least anecdotally.

Weinroll and Saylor (1991) examined the notion that sexual offenders are a unique population of specialized offenders by examining self-reported nonsexual offences by rapists, extrafamilial, and incest child sex offenders. The self-reported median number of sexual offenses for these groups was 136, 50 and 36, respectively, suggesting a unique, or at least specialized, population. However, in his study of 5000 sexual offenders, Maletzky (1991) reported that 24% of them had histories of nonsex offenses, suggesting that nonsexual criminogenic variables may be more important in predicting recidivism than previously thought. Even more dramatic, Weinrott and Saylor (1991) reported that rapists, extrafamilial and incest child molesters had a median number of 136, 50 and 36 nonsex offences, respectively.

Wood and Ogloff (2006) argued that the distinction between types of sex offenders carries important implications for the different types of sex offenders in law, research and risk prediction. However, most studies do not differentiate between sex offender subtypes to examine child-sex offenders and rapists separately. Secondly, non-contact sexual offenders are often not distinguished from contact sexual offenders in the research literature (Wood & Ogloff, 2006).

This reduces the predictive ability of risk assessment tools because the validation studies are using heterogeneous offender samples that should be separated out. In fact, Wood and Ogloff (2006) argued that the sex offender subtypes should be broken down even further to examine heterosexual, homosexual and bisexual child-sex offenders, incest and extra-familial offenders. Furthermore, in the rare instance where studies do separate out the different offender subtypes, they do not separate the subtypes of recidivism in the same way (i.e., they examine any sexual offence rather than a specific sexual offence that is matched to the index offence or simply examine general recidivism).

The third argument then follows naturally. It is often contended that general risk and risk/need tools underestimate the risk level of sexual offenders, because they have overlooked key predict variables that are unique to sexual offending, such as sexual deviation as discussed above. This argument, they believe, is supported by the low average scores that groups of sexual offenders typically have on general risk and risk/need tools compared to the general offender population. This too, has been found in the empirical comparative research.

For example, Simourd and Malcolm (1998) examined 74 sexual aggressors with adult victims, 54 extrafamilial child molesters, and 88 familial child molesters from a sample of federally incarcerated Canadian sex offenders. They found the LSI-R to be predictive among all subgroups. In examining the total LSI-R scores, they found that the familial child molesters scored significantly lower on the LSI-R total score, and the criminal history, education/employment, accommodation, companions and attitude/orientation subscales. These findings lead Simourd and Malcolm (1998) to conclude that many sex offenders have skill deficits in a number of areas, and that focusing on their nonsexual criminogenic risk/needs is required in order to provide a comprehensive intervention and management strategy for those offenders. They also proposed that the LSI-R is an acceptable measure for sexual offenders as their reliability estimates were both acceptable and consistent with previous LSI-R research on other offender samples. Elsewhere, Loza and Simourd (1994) reported that descriptive statistics and the results of a principle components analysis were almost identical for sexual and nonsexual, federal offenders (Loza & Simourd, 1994).

Some jurisdictions have, as a matter of policy, declared that their general risk assessment measure not be administered to their sexual offender population and that staff should rely exclusively on a battery of specialized sex offender risk assessment tools (e.g., Ministry of Public Safety and Solicitor General, British Columbia, 2004; Probation & Welfare Service, Ireland). Other jurisdictions endorse the use of a combination of both general and specialized risk assessment instruments. Moreover, in its survey of state practices, the Interstate Commission for Adult Offender Supervision (2007) reported that all but one of the 47 responding states employ some kind of general risk/need assessment tool in their assessment of sexual offenders and about one-half of these states (i.e., 23) employ some version of the LSI. For example, the State of Hawaii (Gillespie & Anderson, no date) supports use of the LSI-R (Andrews & Bonta, 1995) along with the STATIC-99 (Hanson & Thornton, 1999), and STABLE-2007 (Hanson, Harris, Scott & Helmus, 2007). Researchers have also proposed an integrated use of both kinds of instruments. Noting that the STATIC-99 placed significantly more sexual offenders in the high risk category than the LSI-R, which is contrary to what others routinely expect, Gentry, Dulmau and Theriot (2005) suggested that both kinds of instruments should be used with sexual offenders in order to get a more complete picture of their multiple dimensions of risk.

It should be noted that general risk assessment tools include second generation, static tools such as SIR, and third generation risk/needs tools such as LS (Andrews, Bonta & Wormith,

2006; Bonta, 1996). The difference between the two is particularly relevant when it comes to managing the offender and referring him or her to appropriate intervention. Simourd and Malcolm (1998) warned that it may be short sighted to focus sexual offender treatment exclusively on issues of deviant sexuality since their sample of Canadian federal sexual offenders, with the exception of familial child molesters, displayed the same criminogenic needs as federal nonsexual offenders. Interestingly, they also found a modest correlation ($r = .28$, $p < .001$) between their measure of deviant sexual arousal and the LSI-R total score for a subsample of sexual offenders on whom they had phallometric data.

The emerging picture from empirical investigations and summative meta-analyses on sexual offender risk prediction is instructive, both for general risk/need factors and for specific risk/need instruments. Much of this evidence comes from the work of Hanson, including meta-analyses of risk factors for sexual offenders (Hanson, 1998; Hanson & Harris, 2000b; Hanson & Morton-Bourgon, 2005; Hanson & Morton-Bourgon, 2009). However, the debate remains as to whether general risk assessment tools such as LS should be used in the assessment of sexual offenders.

Use of the Level of Service Instruments with Sexual Offenders

The Level of Service (LS) scales comprise one of the most commonly used general risk assessment tools in criminal justice internationally. It is also one of two actuarial/general risk assessment tools that have been systematically investigated in terms of its predictive validity with sexual offenders, the other one being the Statistical Information on Recidivism (SIR; Nuffield, 1982). Two kinds of studies have examined its predictive validity with sexual offenders. One involves the use of the instrument with a large cohort of offenders in which predictive validities are broken out for various subgroups of offenders including sexual offenders. For example, Girard and Wormith (2004) reported on the predictive validity of the Level of Service – Ontario Revision (LSI-OR; Andrews, Bonta & Wormith, 1995), now known as the Level of Service/Case Management Inventory (LS/CMI; Andrews, Bonta & Wormith, 2004), on a small subsample of 44 sexual offenders. The total score correlated $r = .44$ with any reconviction and $r = .31$ with violent (including sexual) reconvictions. Moreover, these coefficients were quite comparable to those of the remaining 586 nonsexual offenders ($r = .39$ and $r = .28$, respectively). Similarly, in examining the Youth Level of Service/Case Management Inventory (YLS/CMI), Caldwell and Dickinson (2009) reported an area under the curve (AUC) for .657, p<.001 for predicting any recidivism in a sample of juvenile sex offenders. In terms of predicting sex offences in this same sample an AUC of .618 (p<.05) with the YLS/CMI was reported. The Washington State Institute for Public Policy (2006) reported an AUC of 0.650 for 1102 sex offenders who had been in an institution, or sentenced to community supervision, using the LSI-R.

Vrana, Sroga, and Guzzo (2008) examined the relationship between the LSI-OR and recidivism in a random sample of 198 offenders who were convicted of sexual assault in Ontario, half of whom were probationers, while the other half were prisoners released from custody. The mean score on the LSI-OR was 18.42 (SD = 10.29) for inmates and 14.93 (SD = 10.38) for probationers, which placed the rapists in custody at the 36th percentile among adult male incarcerates and at the 66th among adult male probationers (Andrews, Bonta & Wormith, 2004). This finding only partially supports the commonly made contention that sexual offenders on average score lower risk than nonsexual offenders. This sample of sexual offenders in the community actually scored higher than the general population of probationers. The general, violent, and sexual recidivism rates over at least a two-year follow-up were 26.3, 12.6, and 3.0

percent, respectively. Since the sexual recidivism rates were so low, its correlation with risk was not computed. However, the LSI-OR correlated r=.41 and r=.32 with general and violent recidivism, respectively.

Following the introduction of the LSI-R in the state of Washington in 1999, an examination of its predictive validity with sexual offenders was undertaken (Washington State Institute for Public Policy, 2006). Predictive validity was also described as low. Receiver Operating Characteristic analyses (ROC; Hanley & McNeil, 1982) produced an Area Under the Curve (AUC) of .650, which corresponds to a correlation of r=.26 (Rice & Harris, 2005). Nonetheless, from a practical standpoint, recidivism rates in the LSI-R's five risk categories varied from 0.0 percent in the very low risk category to 11.5 percent in the very high risk category. One should note, the base rate for felony sexual offense recidivism over the five-year follow-up was 3.8 percent. Finally, from the pool of 54 LSI-R items, multivariate statistical analyses generated a five-item scale with an AUC of .778, with a corresponding correlation of $r = .48$. However, this scale was not cross-validated with a replication sample.

The second kind of study, as noted at the outset, involves the comparison of a number of risk assessment instruments on a common group of sexual offenders, some of which have included the LS. For example, Bonta and Yessine (2005) examined the accuracy of the LSI:SV, the GSIR Scale, the VRAG, the VRAG-Proxy and the STATIC-99 in predicting violent and general reoffending. In order to do this, they examined a sample of 256 high risk Canadian offenders from across the provinces and territories. Of these men, 202 were released and followed up for official convictions of violence at approximately 41 months post release. The LSI:SV correlated with recidivism r=.27, which was lower than the predictive correlations for the SIR Scale (r=.43), the VRAG (r=.31), the VRAG-Proxy (r=.33), but better than the STATIC-99 (r=.14). Based on the AUC values, all measures were shown to predict violence significantly better than chance (GSIR=.77, SE=.04; VRAG=.68, SE=.08; LSI-SV=.66, SE= .04).

Rossegger, Laubacher, Moskvitin, Villmar, Palermo, and Endrass (2011) argue that there are many well-validated instruments that have been developed over the years with the goal of predicting recidivism. Therefore, they set out to evaluate and compare several tools in order to determine what tools work best in certain situations. In their sample of 109 violet and sex offenders released from Switzerland prisons between 1994 and 1999, they examined the Psychopathy Checklist – Revised (PCL-R), the Historical, Clinical, Risk Management – 20 (HCR-20), the LSI-R, the VRAG and the Swiss assessment instrument FOTRES. They found that each tool was able to successfully discriminate recidivists from nonrecidivists. The VRAG had the lowest AUC (0.78), followed by the LSI-R (0.82), the HCR-20 (0.87), the FOTRES (0.88), and finally the PCL-R had the highest AUC (0.90). The mean LSI-R score in this sample was 21 ($SD = 8.9$) In terms of distribution of scores, twenty-nine percent ($n = 32$) of the offenders were assigned to the very low risk level, 30% ($n = 33$) were low risk, 33.9% ($n = 37$) were medium risk, six percent ($n = 6$) were high risk, and only one percent (n=1) was very high risk.

In a meta-analytic review of sex offender risk items and composite scales, Hanson and Morton-Bourgon (2009) reported on four studies that examined the predictive validity of the LS and compared these results to those of other general risk assessment instruments. They concluded that the LS, along with the VRAG, SORAG and SIR were the best predictors of general recidivism for sexual offenders and that the LS along with the VRAG, SORAG, the Risk Matrix – Combined and the SIR were the best predictors for violent recidivism.

Drawing on four different sets of studies, Hanson (2009) was able to compare the predictive validity of five general and violence specific risk assessment tools to four sexual offense risk tools on three kinds of outcome, general violent and sexual offense recidivism. However, the difficulty with these results from the standpoint of a comparative analysis is that the meta-analyses drew from their own unique set of individual studies. Secondly, the studies examining the sexual offense risk scales were validated on sexual reoffending and were limited to sexual offenders, while the studies examining general and violence specific risk assessment tools were validated on general and violent recidivism and were conducted on general offenders. Regardless, the specialized sex offense prediction tools clearly did a better job of predicting sexual recidivism of sexual offenders than the general and violence specific risk assessment tools with the average correlation across four sexual offense specific tools (Static-99, SR-20, MnSOST-R and SORAG) being $r = .32$ and the average correlation among five general and violence specific tools (HCR-20, LS, PCL-R, SIR scale and VRAG) being $r = .21$. They also did a reasonable job of predicting sexual offenders' general recidivism (the mean correlation across four tools being $r = .27$) and for violent recidivism (mean $r = .26$). This compares reasonably to the general and violence specific risk assessment tools' capacity to predict violent recidivism among general offenders (mean $r = .26$) but less so than their capacity to predict general recidivism among general offenders (mean $r = .36$). Hanson went on to demonstrate, again with the same caveat, that he drew from different studies and meta-analyses, to demonstrate that commonly accepted static predictors such as age, and number of youth and adult criminal history, and dynamic needs such as substance abuse, criminal companions and antisocial personality have comparable predictive validity for the general recidivism of general adult offenders and sexual recidivism of sexual offenders.

Finally, a couple of studies have examined general and specialized risk assessment instruments with adolescent sexual offenders. In a comparison of instruments with a small sample of adolescent sexual offenders (N = 77), Morton (2003) found a significant correlation for violent recidivism (.31), but not for general recidivism (.16) or sexual recidivism (.13) using the youth version of the LS, the YLS/CMI (Hoge & Andrews, 2002). However, uniformly disappointing correlations were found for the RRASOR (Hanson, 1997; -.07, .04 and .04), the STATIC-99 (Hanson & Thornton, 1999; .10, .16 and .18), and the ERASOR (Worling & Curwen, 2001; .13, .15 and .12) for violent, general and sexual recidivism, respectively. Interestingly, the YLS/CMI was correlated particularly well with the ERASOR (.73), a tool that was designed specifically for the prediction of sexual recidivism among adolescent sexual offenders and comprised of many sexually specific items. In a larger study of 220 young offenders, comparing instruments over a follow-up period of up to 14 years, Skowron (2004) found that the ERASOR (Worling & Curwen, 2001) was a better predictor of sexual recidivism (.37 vs. 25), but the YLS/CMI was a better predictor of general recidivism (.38 vs. .28), while the two were comparable for violent recidivism (.27 vs. .24). Although there are some perplexing differences between the findings of these two studies, collectively, they suggest that the LS is an appropriate risk assessment tool for adolescent sexual offenders.

The Current Investigation

This study was designed to address two important questions about risk assessment of sexual offenders; one to examine the utility of a general risk/need instrument (LS) with sexual offenders on various kinds of outcome; and two, to investigate the use of professional judgement to augment the risk/need assessment. It did so by examining sexual offenders who were extracted from a large cohort of Canadian provincial offenders (probationers and prisoners). Descriptive

statistics were generated on a number of legal and demographic variables, the LS, and three kinds of recidivism outcome (any, violent and sexual). The predictive validity of the LS was determined for all three types of recidivism both for sexual offenders on probation and those who were released from custody. Supplementary professional judgment was investigated by means of the "override" feature of LS. The extent and circumstances of its use were examined as was its impact on the predictive validity of LS. All of the above analyses were also conducted on the remainder of the cohort, the nonsexual offenders, primarily for comparison purposes.

Methodology

Sample

The sample was derived from a cohort of offenders who were under the responsibility of the province of Ontario, Canada. The original cohort included all male and female offenders who, during one calendar year (2004), were released from Ontario provincial correctional facilities after serving a sentence of at least one month,[2] were sentenced to a conditional sentence (to be served in the community), or began a term of probation with the Ministry of Community Safety and Correctional Services (MCSCS). The sample consisted of all offenders in the cohort who had been administered an LSI-OR in conjunction with their sentence. The sexual offense sample was made up of 1,905 sex offenders of whom 1,849 (97.1%) were male and 56 (2.9%) were female. Broken down by type of disposition, they included 733 (38.5%) inmates who were released from a prison sentence (717 males and 16 females), 349 (18.3%) offenders who were given a conditional sentence to be served in the community (341 males and 8 females), and 823 (43.2%) offenders who were given a term of probation (791 males and 32 females). Their mean age at the date of data extraction was 41.91(SD = 12.66). Most were Caucasian (61.1%), with the balance being Aboriginal (12.1%), Black (8.6%) and other/unknown (18.2%). Prisoners were sentenced to an average of 224.20 (SD = 152.52) days in custody and 184.11(SD = 254.95) days under community supervision. Those on a conditional sentence were sentenced to an average sentence of 333.52 (SD = 202.21) days. Probationers were sentenced to an average of 573.53 (SD = 325.28) days on probation.

The nonsexual offender sample consisted of 24,545 offenders of whom 19,767 (80.5%) were male and 4,778 (19.5%) were female. Broken down by type of disposition, they included 4,217 (17.2%) inmates who were released from a custodial sentence (3,938 males and 279 females), 2,876 (11.7%) offenders who were given a conditional sentence to be served in the community (2,177 males and 699 females), and 14,475 (59.0%) offenders who were given a term of probation (13,652 males and 3,800 females). Their mean age at the date of data extraction was 37.63 (SD = 11.57). Most were Caucasian (59%), with the balance being Black (7.2%), Aboriginal (6%), and other/unknown (29.7%). Prisoners were sentenced to an average of 191.24 (SD = 134.54) days in custody and 148.12 (SD = 148.12) days under community supervision. Those on a conditional sentence were sentenced to an average of 270.40 (SD = 192.34) days. Probationers were sentenced to an average of 462.35 (SD = 229.04) days on probation.

Prediction and Outcome Measures

LSI-OR

The Level of Service - Ontario Revision (LSI-OR; Andrews, Bonta & Wormith, 1995) is described as a fourth generation risk assessment tool in that it goes beyond traditional risk and needs by including other clinically relevant factors and incorporating a case management portion (Andrews, Bonta & Wormith, 2006), thus extending beyond its predecessor the Level of Service Revised (LSI-R; Andrews & Bonta, 1995). The instrument includes a general risk/need section

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[2] In Canada, all offenders who are sentenced to less than two years are placed under provincial responsibility.

consisting of 43 items each of which is scored in a dichotomous fashion (0 = not present or 1 = present). The items are organized into the central eight (Andrews & Bonta, 2010) subscales: criminal history (8 items), education/employment (9 items), family/marital (4 items), leisure/recreation (2 items), companions (4 items), procriminal attitude/orientation (4 items), substance abuse (8 items), and antisocial pattern (4 items).

These items are totalled to create eight domain scores and a total general risk/need score, which is then used to determine the offender's initial risk level on a five-point ordinal scale ranging from very low risk to very high risk. The initial risk level may be overridden in either direction (i.e., from a lower to higher risk level or from a higher to a lower risk level) to create a final risk level. The two level variables were coded from 1 to 5 and an "override score" was calculated by subtracting the initial risk level score from the final risk level score. For example, a score of +2 would indicate that the override was used to increase the risk level by two levels, while a score of 0 would indicate that no change was made to the initial risk level. The total general risk/need score of the LSI-OR correlates very highly with the 54 item LSI-R ($r = .96$; Rowe, 1999; Andrews, Bonta & Wormith, 2004). The general risk/needs score has demonstrated predictive validity for general offenders and sex offenders for any recidivism ($r = .39$ and .41, respectively) and for violent recidivism, which includes sexual recidivism ($r = .28$ and .31, respectively; Girard & Wormith, 2004).

The specific risk/need section contains two subscales: personal problems with criminogenic potential (14 items) and history of perpetration (9 items), also scored dichotomously. These items are intended to identify additional risk factors and criminogenic needs, as well as guide the assessors in deciding whether the risk level should be adjusted or "overridden". The specific risk/need section correlated with general and violent recidivism for nonsexual offenders ($r = .22$ and $r = .35$, respectively) and for sexual offenders ($r = .25$ and $r = .20$). The LSI-OR consists of three additional sections intended to guide case management; institutional factors (10 items), which records problems and management issues during previous incarcerations, other client issues (18 items), which includes social, health and mental health issues that are likely to deserve particular attention, and special responsivity considerations (8 items), which include characteristics such as ethnicity, cognitive disabilities and personality features that are relevant to how one works with an offender. The LSI-OR also includes a strength score, which is a simple summation of the number of central eight subscales that constitute a strength or protective factor for the offender (Andrews, Bonta & Wormith, 1995).

Recidivism

For the purpose of the current study, recidivism was defined as any criminal offense for which an offender was returned to MCSCS. These offenses are recorded in the Offender Tracking and Information System (OTIS), which is operated by MCSCS and documents all criminal offenses that occur in Ontario. However, there are some limitations to this data source. Any offenses committed in other provinces were not be included, nor were any convictions that lead to sentences other than incarceration or community supervision (e.g., fines, suspended sentences, and alternative measures).

Five measures of recidivism were constructed from offender file information. First, a dichotomous variable (yes = 1, no = 0) was created to identify those who did and did not recidivate during the follow-up period. The second recidivism variable was the time to recidivate, which was measured in the number of days that offenders were in the community and eligible to recidivate. Thus, for the custodial sample, the time to recidivate was represented by the number of days from their release date to the date of reoffense or re-entry into custody. In the

community sample, this was the time between the LSI-OR assessment date and the data extraction date when files were reviewed for evidence of further contact with the criminal justice system. Hence, the follow-up period ran from offenders' release from custodial sentence or their admission to community supervision in 2004 to the extraction date in January, 2009.

The third recidivism variable included was the Offense Severity Scale (OSS; Stasiuk, Winter & Nixon, 1996), which was coded based on 26 categories that were rank ordered in accordance with the mean sentence length for each offense category (Ontario, 1983). This scale was originally developed by MCSCS from an analysis of 60,000 sentences given to offenders in Ontario over a period of one year, where the average sentence length determined offense severity (Stasiuk et al., 1996). Offense categories ranged from 0 (no reconviction) and 1 (municipal bylaw offences), to 24 (serious violent offences) and 25 (homicide). Offenses with unknown severity were coded as missing. The OSS categories were used to categorize offenders' index offenses as well as their recidivistic offenses (Appendix A). Finally, dichotomous violent recidivism consisted of six categories from the OSS (Assault and Related; Miscellaneous Offenses Against the Person; Weapons Offenses; Non-Violent Sexual Offenses; Serious Violent Offenses) and dichotomous sexual recidivism consisted of two categories from the OSS (Non-Violent Sexual Offenses and Violent Sexual Offenses).

Procedure

Offenders who were released from a custodial sentence or who were admitted to a conditional sentence or to probation in 2004 were identified electronically from the Ministry's Offender Tracking and Information System (OTIS). Descriptive information was obtained from OTIS including age, gender, and self-reported racial background [Aboriginal (i.e., First Nation, Metis and Inuit) and Nonaboriginal]. An automated version of the LSI-OR was introduced into the organization in 1997 allowing field staff to enter all details of their assessment into an electronic record for scoring and record keeping. The LSI-OR is administered to all adult inmates who are sentenced to at least one-month custody and to all probationers and parolees in Ontario (Wormith, 1997). Therefore, a computer search on the LSI-OR database was then conducted to identify all inmates of the cohort who had been administered an LSI-OR during their period of incarceration in 2004 and all community offenders in the cohort who had been administered an LSI-OR at the outset of their community supervision, also in 2004.

Sex offender and nonsexual offender groups were created based on electronically coded data in OTIS database. The sex offender group included all offenders with either a history of sexual offending or current convictions for sexual offenses. These included both Violent Sexual Offenses and Non-Violent Sexual Offenses (categories 23 and 21, respectively, in the OSS rating scheme). The sample included 1,905 offenders who were identified in OTIS as having committed a sexual offense. Of these 759 had at least one conviction for a current sexual offense based on the OSS categories for their index offence.

Any evidence of recidivism, as indicated by a reconviction, was then recorded for each offender and saved in the derived database in January, 2009. General, violent and sexual recidivism was coded according to the offense categories described previously. The data from the two data files were then merged by offender identification number into a single file for data analyses. Consequently, the final data file included descriptive legal and demographic information about the offender, including variables to identify sexual and nonsexual offenders and the type of sentence that was being served (prison, conditional sentence or probation), the LSI-OR total and item scores, and the measures of recidivism.

Data Analysis

Although the prime focus of this investigation was on sexual offenders, many of the following analyses were conducted on both sexual offenders and nonsexual offenders in order to compare the performance of the LSI-OR with sexual offenders to the larger mainstream segment of the offender population for whom the instrument was originally intended. By making these comparisons from a common cohort, one avoids the difficulty of making comparisons from different agencies with data collected at different times, assessments conducted by different assessors, and measured against different operational definitions of the outcome variable.

A variety of statistical procedures were performed on the data set. Descriptive statistics were obtained on the sample of sex offenders and comparisons made to the remainder of the cohort the nonsexual offenders as well as comparisons within the sexual offenders by type of sentence. Reliability analysis was limited to assessments of internal consistency using Cronbach's (1951) coefficient alpha. Predictive validity was assessed with correlations, ROC curves (Hanley & McNeil, 1983), and survival analysis. Given the size of the data set, it was also decided to examine the predictive validity of individual items from the LS/CMI and compare these correlations between the sex offender and nonsex offender sample to determine whether there was any particular pattern suggesting some items or kinds of items were more or less predictive of recidivism among sexual offenders compared to the general offender population and whether certain kinds of items were most predictive of sexual recidivism. The impact of the override on predictive validity was assessed by comparing the magnitude of the difference in survival across risk levels before and after the override feature was exercised (i.e., initial and final risk level). Correlation and multiple regression analyses were used to identify offender characteristics that were related to the use of the override feature. Item analyses of all LSI-OR items were also conducted, correlating items scores with recidivism and the use of the override.

Results

Sex Offenders and Nonsexual Offenders on Demographic Characteristics, LSI-OR and Recidivism

Descriptive and demographic characteristics were calculated for sexual offenders and nonsexual offenders and compared to each other in Table 1. Sexual offenders were significantly older than nonsexual offenders. They were more likely to be male and Aboriginal. They also had a higher offense severity score on their index offense, which is expected given the severity ratings of the sexual offense categories. Sexual and nonsexual offenders were also compared on a number of LSI-OR measures. Sexual offenders scored significantly higher on all LSI-OR summary measures, except strengths, on which they scored significantly lower. These measures included the LSI-OR general risk/need total score and corresponding risk level, both before and after the uses of the override function, and the specific risk/need score. They also scored higher on the measure of risk level change indicating that assessors used the override feature to increase their risk level significantly more than they did for nonsexual offenders. It is noted, however, that a number of these differences, although significant because of the very high degree of power in these analyses, are relatively small.

The recidivism rates of sexual and nonsexual offenders were compared. Interestingly, sexual offenders had a higher rate of general reoffending than nonsexual offenders and when they did reoffend, they did so more quickly. However, there was no difference between groups in terms of their violent reoffending and their sexual reoffending. As has been reported elsewhere [e.g. 3.8% by the Washington State Institute for Public Policy (2006)] the rate of sexual reoffending was particularly low.

Recidivism (general, violent and sexual) of the sexual offender sample was then investigated in more detail. First, the general recidivism rate of sexual offenders, (44.4%) was examined by race, gender, and type of sentence in Table 2. A one-way ANOVA revealed a significant main effect for disposition, F (2, 1902) = 80.96, p <.01. Since Levene's test was significant, F (2, 1902) = 45.62, p <.01, the Dunnett's C post hoc was performed. In terms of the disposition, those placed on a custodial sentence were more likely to recidivate (61.4%) than those placed on probation (36.8%) and those placed on a conditional sentence (26.7%). These differences were all significant. There was also a significant main effect for race, F (1, 1903) = 45.90, p <.01. Aboriginal offenders (64.9%) were found to recidivate more than Nonaboriginal offenders (41.5%). There was not a significant difference between males (44.13%) and females (53.57%) on general recidivism, F (1,1903) = 1.96, p = .161.

Secondly, the violent recidivism rate of sexual offenders (12.3%) was also examined by race, gender, and type of sentence in Table 2. A one-way ANOVA revealed a significant main effect for disposition, F (2, 1902) = 29.281, p <.01. Since Levene's test was significant, F (2, 1902) =120.17, p <.01, the Dunnett's C post hoc was performed. In terms of the disposition, those placed on a custodial sentence were more likely to recidivate violently (19.5%) than those placed on probation (8.1%) and those placed on a conditional sentence (7.2%). There was no significant difference between those on probation and those on a conditional sentence. There was no significant main effect for race, F (1, 1903) = 2.57, p = .11. Aboriginal offenders (15.6%) did not recidivate violently significantly more than Nonaboriginal offenders (11.9%), but females were found to significantly recidivate violently (26.19%) more than males (11.90%), F (1,1903) = 11.19, p < .001.

Finally, the sexual recidivism rate of sexual offenders, (3.7%) was also examined by race, gender, and type of sentence in Table 2. A one-way ANOVA revealed a significant main effect for disposition, F (2, 1902) = 12.68, p <.01. Since Levene's test was significant, F (2, 1902) = 52.59, p <.01, the Dunnett's C post hoc was performed. In terms of the disposition, those placed on a custodial sentence were more likely to recidivate sexually (6.4%) than those placed on probation (2.4%) and those placed on a conditional sentence (1.1%). There was no significant difference between those on probation and conditional sentence. There was also a significant main effect for race, F (1, 1903) = 3.99, p =.05. Aboriginal offenders (6.1%) were found to recidivate sexually more than Nonaboriginal offenders (3.4%). There was no significant difference between males (32.39%) and females (44.69%), F (1, 1903) = 0.61, p < .44.

Internal Consistency

Internal consistency of the LSI-OR was examined using Cronbach's alpha. This analysis was conducted on the total sample as well as the two main subgroups, sexual offenders and nonsexual offenders to assess whether the scale performed differently with the specialty group of offenders, the sexual offenders. Since three of the LSI-OR items are actually calculated in part based on offender's score on previous items, the Alpha calculation was repeated without these three items. Analysis revealed strong alpha levels for both the 43-item LSI-OR (= .92) and the 40-item LSI-OR (= .91) on the full sample. As expected and reported previously (Andrews, Bonta & Wormith, 2004), the alpha coefficient was lower and quite varied for the eight domains of the general risk/need section. Small coefficients were systematically related to domains having few (two or four) items. When examined by offender type, there was actually a slight, but consistent, increase in alpha coefficients with the sexual offender sample. These alpha rates, as well as the alpha rates for all of the subscales, are presented for sex offenders, nonsexual offenders and the total sample in Table 3.

Predictive Validity of the LSI-OR

  The correlations between the LSI-OR and general, violent, and sexual recidivism were examined for the complete sample, as well as the sexual offenders and nonsexual offenders to assess the applicability of the LSI-OR to a sex offender population. These correlations were calculated for the general risk/need total score, as well as the eight domain scores and the additional sections of the LSI-OR, specifically the specific risk/need section and its two subsections (personal problems and perpetration history), other noncriminogenic needs, responsivity, and strengths. The general risk/needs score was highly correlated with general recidivism ($r = .44$, $p < .001$) on the full sample and even more highly on the sexual offender sample ($r = .47$, $p < .001$). Correlations on the full sample were lower for the prediction of violent recidivism ($r = .29$, $p < .001$) and even more so for sexual recidivism ($r = .19$, $p < .001$) with no discernable difference in the predictive validity for sexual offenders. Sources of the LSI-OR's predictive validity for general recidivism on the complete sample and the sexual offenders are reflected in the coefficients from the central eight domains. The correlations with general recidivism were higher for sexual offenders than nonsexual offenders on all domains except substance abuse. However, as was the case for the general risk/needs score, this pattern did not carry over to the prediction of violent or sexual recidivism (Table 4).

  Concerning the less frequently examined section of the LSI-OR, the specific risk/need section, and both of its subscales were highly correlated with general recidivism for the full sample ($r = .33$, $p < .001$) and more highly so for the sexual offenders ($r = .37$, $p < .001$). However, their correlations with violent and sexual recidivism for both sexual and nonsexual offenders, although significant, were substantially lower. Interestingly, noncriminogenic needs were also correlated with general recidivism both for sexual offenders ($r = .23$, $p < .001$) and nonsexual offenders ($r = .18$, $p < .001$), but less so for violent and sexual recidivism. Similarly, responsivity displayed modest correlation with general recidivism amongst sexual offenders ($r = .18$, $p < .001$) and nonsexual offenders ($r = .19$, $p < .001$), but less so with violent and sexual recidivism. As expected, strengths were negatively correlated with recidivism, although the coefficients were low both for sexual offenders and nonsexual offenders on general ($r = -.12$, $p < .001$) recidivism and lower on violent and sexual recidivism.

  Analyses of subgroups of sexual offenders revealed similar patterns. For example, the general risk/need score correlated highly with general recidivism for both Aboriginal and Nonaboriginal offenders ($r = .47$, $p < .001$ and $r = .45$, $p < .001$, respectively; Table 5), but less so for violent recidivism, particularly for Aboriginal offenders ($r = .16$, $p < .018$ and $r = .31$, $p < .001$, respectively) and for sexual recidivism ($r = .18$, $p = .006$ and $r = .16$, $p < .001$, respectively). All general risk/need subsections of the LSI-OR correlated well with general recidivism for both Aboriginal and Nonaboriginal sexual offenders, as did the specific risk/need section ($r = .38$, $p < .001$ and $r = .34$, $p < .001$).

  The assessment of the predictive validity of the LSI-OR with female sexual offenders was hampered by the small sample (n = 56; Table 6). However, significant findings were found for the prediction of general recidivism on the general risk/need total score ($r = .36$, $p = .006$) and on two domains, substance abuse ($r = .35$, $p < .001$) and antisocial pattern ($r = .31$, $p = .021$). The only other significant correlation for female sexual offenders was between the specific risk/need domain, history of perpetration, and sexual recidivism ($r = .29$, $p < = .028$).

  When the sexual offenders were grouped by type of sentence (custody, conditional sentence or probation), the correlations reflected the overall pattern (Table 7). The LSI-OR and its sections and domains predicted general recidivism very reliably, but less so violent and sexual

recidivism. For example, the general risk/needs total score predicted general recidivism amongst custody offenders ($r = .45, p < .001$), conditionally sentenced offenders ($r = .41, p < .001$), and probationers, ($r = .34, p < .001$). They did so moderately well for violent recidivism ($r = .27, p < .001$ for custody, $r = .23, p < .001$ for conditional sentence, and $r = .17, p < .001$ for probation), but less so for sexual recidivism ($r = .17, p < .001$ for custody, $r = .06$, p = .268, for conditional sentences, and $r = .09, p < .008$ for probation). The central eight domains and the other LSI-OR sections also predicted general recidivism well, but less so for both violent and sexual recidivism, although specific risk/need section perpetration history was notably correlated with sexual recidivism among conditionally sentenced offenders ($r = .20, p < .001$).

Finally, a series of correlations was conducted to examine the LSI-OR risk levels with general, violent and sexual recidivism to examine the possible decrement in predictive validity when one collapses from a raw score (0 to 43) to a simple risk level (1 to 5) and when practitioners are allowed to override the score derived risk level based on other pieces of information and their professional judgment. The initial risk level is the score-derived level and the final risk level is the risk level after the override option has been applied. Results are presented for all offender groups on general, violent and sexual recidivism in Table 8. The correlations between the initial LSI-OR risk level for general, violent and sexual recidivism for the entire sample of sexual offenders and the various subgroups mirror the correlations derived from the total score although, as one would expect, they consistently show a slight decrement in predictive validity. The initial risk level correlated $r = .45, p < .001$ with general recidivism, followed by $r = .27, p < .001$ for violent recidivism and $r = .16, p < .001$ for sexual recidivism on the total sample. The same pattern was found for sexual offender subgroups defined by race, gender and type of sentence. For example, initial risk level correlated with general, violent and sexual recidivism among Aboriginal offenders ($r = .40, p < .001, r = .12$, p = .067, and $r = .12$, p = .059, respectively), as it did with Nonaboriginal offenders ($r = .42, p < .001, r = .29, p < .001$, and $r = .16, p < .001$, respectively).

When these analyses were repeated using the final risk level, the same pattern was found, but a consistent decrement in the correlations emerged across all sex offender subgroups and across the three measures of recidivism. The final risk level correlated with general recidivism $r = .26, p < .001$, violent recidivism $r = .18, p < .001$, and sexual recidivism $r = .11, p < .001$, on the complete sample of sexual offenders. The same pattern was found for sexual offender subgroups defined by race, gender and type of sentence. For example, final risk level correlated with general, violent and sexual recidivism among Aboriginal offenders ($r = .22, p < .001, r = .10$, p = .146, and $r = .11$, p = .105, respectively), as it did with Nonaboriginal offenders ($r = .22, p < .001, r = .19, p < .001$, and $r = .10, p < .01$, respectively).

ROC curves

A series of ROC analyses were conducted to examine the LSI-OR total and section scores with general and violent recidivism. As one would expect, the Areas Under the Curve (AUC) closely mirrored the pattern of correlations, although they may render a better estimate of predictive validity for sexual recidivism, given its very low base rate (Rice & Harris, 2005). AUC values are presented in Table 9. For example, the general risk/need total score produced an ROC of AUC = .76 for all offenders on sexual recidivism and virtually the same predictive ROC for sexual offenders (AUC = .77) and nonsexual offenders (AUC = .75). These coefficients are comparable to those found using specialized sexual offender risk assessment tools. Moreover, they are also similar to ROCs found in the present study for the prediction of general recidivism (AUC = .76, $p < .001$ for the total sample, AUC = .77, $p < .001$ for sexual offenders and AUC =

.76, $p < .001$ for nonsexual offenders) and violent recidivism (AUC = .73, $p < .001$ for the total sample, AUC = .74, $p < .001$ for sexual offenders, and AUC = .73, $p < .001$ for nonsexual offenders). The majority of coefficients for the domain scores and other section scores fell in the AUC = .60, $p < .001$, to .70, $p < .001$, range, indicating that the LSI-OR and its subscales are able to predict recidivism in both sexual offenders and nonsexual offenders.

Survival Analyses

Survival analyses were performed on general, violent and sexual recidivism using both the initial risk levels and the final risk levels (i.e. after the override decision was applied) for both sexual offenders and nonsexual offenders. Mean survival times and the 95 percent confidence intervals for sexual offenders and nonsexual offenders using the initial risk levels and final risk levels are presented for general recidivism in Table 10, for violent recidivism in Table 11 and for sexual recidivism in Table 12. The overall comparison between risk levels and pair-wise comparisons between all pairs of risk level are presented as Log Rank (Mantel-Cox) Chi-square analysis in Table 13.

In all cases, survival curves varied systematically and in the expected direction by risk level. The overall Log Rank (Mantel-Cox) Chi-Square (1) Linear trend statistic was significant, $p < .001$, for all survival functions using both the initial and final risk level categories on both sexual offenders and nonsexual offenders. However, the same kind of decrement in predictive validity that was found with the introduction of the override function in previous analyses was also found in the survival analyses for sexual offenders and nonsexual offenders, but particularly the former. For example, for general recidivism, the survival time of low and medium risk sexual offenders was no longer significant (Table 13). For violent recidivism, the magnitude of significance difference between very low and medium risk and between low and medium risk was reduced with the introduction of the override (Table 13). For sexual recidivism, the significant differences between very low risk and high risk, low risk and high risk, and medium risk and high risk (all p's $< .001$) were no longer significant after the override was exercised (Table 13). All comparisons between final risk levels for nonsexual offenders remained highly significant, $p < .001$, because of the extremely high sample size. Survival curves for general, violent and sexual recidivism using the initial and final (override) risk levels are portrayed for sexual offenders and nonsexual offenders in Figure 1 through 12.

These findings raise questions about the value of the override feature and the apparent loss of predictive validity when this option is afforded to practitioners. In particular, they raise questions about the applicability of the override with sexual offenders. For example, are assessors more likely to invoke the override with sexual offenders and, if so, in what direction do they apply it? Secondly, how does its use affect the predictive validity of the instrument and what factors precipitate its use?

Item Analysis of LSI-OR Items

Correlations between all items found in each of General Risk/Needs (Section A), Specific Risk/needs (Section B), Social, Health and Mental Health (Section D), and Responsivity (Section G) were computed with the three measures of recidivism, general, violent and sexual. Due to the magnitude of this output, results are presented in Appendix B. The most apparent and striking finding among these analyses is the number of highly significant item correlations with general recidivism for the sexual offender sample, correlations that for the most part are even higher than the corresponding correlations for nonsexual offenders. Correlations were particularly high and consistently so for the criminal history items (.24 to .45). Only one item (item 30) of the 43 items in the General Risk/Needs Section was nonsignificant and three others (items 12, 18 and 40)

generated correlations of less than .10 on the sex offender sample. As anticipated because the LSI-OR total score was correlated less strongly with violent recidivism, so too, were the item correlations with violent recidivism. However, item correlations with violent recidivism were again at least as, if not more, strongly correlated with outcome as they were for nonsexual offenders. Four items (12, 18, 30 and 40) were nonsignificant and 11 other items produced correlations of less that .10 on the sexual offender sample. Continuing this trend, item correlations were least predictive of sexual recidivism, both for the sexual offender and nonsexual offender samples. Eight items were nonsignificant (12, 18, 26, 30, 32, 37, 39 and 40) and 12 additional items correlated less than .10 with sexual recidivism on the sexual offender sample. Interestingly, the item correlations predicting sexual reoffending tended to be very similar for sexual and nonsexual offenders. The mean item correlation for the two groups was the same for sexual (i.e., .09) and violent (.14) reoffending, while it was actually larger for sexual offenders (.24 vs. .21) in the prediction of any recidivism.

　　　　As individual (binary) items are not expected to generate large correlations with the criterion variable, hence the creation of scales with multiple, diverse items, the current results are encouraging. Most items correlated with general recidivism, both for sexual offenders and nonsexual offenders. These findings support the applicability of a general risk/need assessment tool, like LSI-OR, to the sex offender population.

　　　　Some interesting item correlations were discovered from Sections B, C, F and G. For example, in Section B, Clear Problems of Compliance was consistently correlated with general, violent, and sexual recidivism for both sexual offenders and nonsexual offenders, as was another item with a similar theme, Escapes and UAL. However, Section B items that conceivably influenced staff to exercise the override option, such as Diagnosis of Psychopathy and Other Personality Disorder, were uncorrelated with any kind of recidivism for either group. Further analyses of these items might be prove to be instructive for a more effective use of the override (see below), but are not explored at this point.

　　　　As expected item correlations from other sections of the LSI-OR tended to be lower. However, some items in Section F, Other Client Issues, such as Financial Problems and Accommodation Problems, which are also reflected in Section A8, Antisocial Pattern, and victimization items (Family, Physical, Emotional and Neglect, but not Sexual) were consistently correlated with outcome. Similarly, it was not surprising to find that Motivation as a Barrier, from Section G, Special Responsivity Considerations, was also correlated with outcome.

Use of the Override

　　　　A number of analyses were performed to determine when the override was used and how its use impacted on the predictive validity of the instrument. As can be seen in Table 14, both the correlations and the AUC values are routinely higher for the initial risk level than the final (override) risk levels in the prediction of general, violent and sexual recidivism on the complete sample. For nonsexual offenders, the original risk levels provide a better predictor than those derived after the professional override is applied as correlations decrease from $r = .42$, $p < .001$, to $r = .37$, $p < .001$, for general recidivism, from $r = .27$, $p < .001$, to $r = .23$, $p < .001$, for violent recidivism, and from $r = .17$, $p < .001$, to $r = .15$, $p < .001$, for sexual recidivism. These differences become more pronounced when applied to sexual offenders with decrements from $r = .45$, $p < .001$, to $r = .26$, $p < .001$, for general recidivism, from $r = .27$, $p < .001$, to $r = .18$, $p < .001$, for violent recidivism, and $r = .16$, $p < .001$, to $r = .11$, $p < .001$, for sexual recidivism.

　　　　Moreover, it is noted that the override option was exercised much more frequently to increase risk (14.9%) than to decrease (1.6%) risk. This difference was even more pronounced in

the adjustment to sexual offender risk level (33.5 % increase and 1.6 % decrease in risk level) compared to nonsexual offenders (13.5 % increase and 1.6 % decrease; (2) = 580.53, $p < .01$).

In an effort to determine what may have contributed to the decrement in predictive validity with the use of the override function, two additional analyses were performed. First, the sexual offender sample was assigned to an initial-by-final risk level matrix and recidivism rates within each cell were examined (Table 15). The small sample size in some cells precluded statistical analysis. However, inspection of the recidivism rates across the initial-final risk level cells is consistent with a decrement in predictive validity of the assessment process. For example, above the 'no change' diagonal (very low/very low to very high/very high), most recidivism rates were as low or lower than the no change group for that specific risk level. For example, the sexual offenders in the initial low risk category who were overridden to medium, high, and very high risk recidivated at lower rates (24.2%, 19.0%, and 5.9%, respectively) that the initial low risk sexual offenders who were not overridden (31.7%). Generally speaking, the relatively few sexual offenders (n = 31) who were overridden to a lower risk level, collectively, seem to have been done appropriately as their recidivism rates were lower that their unadjusted counterparts. For example, the recidivism rate of the 19 very high risk sexual offenders whose risk levels were reduced was considerably lower (63.2%) than their unadjusted counterparts (84.4%).

A second strategy was to examine the relationship between the risk category change score and a number of demographic and LSI-OR variables. However, since changes in risk level by means of the override were highly related to the LSI-OR total score (Table 16) simply because of the asymmetry of the override process (i.e. high risk offenders are already high risk and close to the ceiling and therefore are more likely to be overridden downward, while low risk offenders have much more room available to be overridden upwards), partial correlations controlling for risk level were computed (Table 16). For sexual offenders, controlling for risk, increases in risk level by means of the override was not correlated with age or race (Aboriginal), although it was negatively related to being female (r = -.05, $p = .04$). Among LSI-OR scales, it was correlated with Total Specific Risk/Needs ($r = .15$, $p < .001$) and its subscales personal problems with criminogenic potential ($r = .14$, $p < .001$) and history of perpetration ($r = .08$, $p < .001$), prison experience ($r = .05$, $p = .02$), social, health and mental health problems ($r = .10$, $p < .001$) and responsivity considerations ($r = .12$, $p < .001$). It was also correlated with three general risk/need subscales; criminal history (r = -.11, $p < .001$), procriminal attitudes (r = .11, $p < .001$), and antisocial pattern (r = .16, $p < .001$).

For nonsexual offenders, controlling for risk, increases in risk level was not correlated with being Aboriginal, but it was correlated with age ($r = .08$, $p < .001$) and negatively with being female ($r = -.08$. $p < .001$). Among LSI-OR scales, it was correlated with Total Specific Risk/Needs ($r = .18$, $p < .001$) and its subscales personal problems with criminogenic potential ($r = .17$, $p < .001$) and history of perpetration ($r = .11$, $p < .001$), prison experience ($r = .05$, $p < .001$), strengths ($r = -.03$, $p < .001$), social, health and mental health problems ($r = .03$, $p < .001$) and responsivity considerations ($r = .13$, $p < .001$). It was also correlated with five of the eight general risk/need subscales; education/employment ($r = -.07$, $p < .001$), family/marital ($r = .06$, $p < .001$), companions (r = -.06, $p < .001$), procriminal attitudes ($r = .09$, $p < .001$), and antisocial pattern ($r = .08$, $p < .001$). These findings were then used in the next set of analyses.

Demographic and LSI-OR variables that were correlated with change in risk in either sample were included in multiple regression analyses on change in risk for sexual and nonsexual offenders. For sexual offenders, after entering LSI-OR total score in block one ($R^2 = .329$; F (1,1903) = 931.28, $p < .001$), the remaining demographic and LSI-OR measures in block two

improved the regression analysis ($R^2 = .351$; $F(8,1896) = 127.94$, $p < .001$) in a minimal but significant way, (change in $R^2 = .022$); F_{change} (7, 1896) = 9.17, $p < .01$). Measures that were related to change in risk level, independent of risk score included personal problems (B = .045, $p < .001$), history of perpetration (B = .030, $p < .07$), social, health, and mental health problems ($B = .022$, $p < .02$) and responsivity (b = .055, $p < .01$) being significant factors (Table 17).

For nonsexual offenders, after entering LSI-OR total score in block one ($R^2 = .094$; F (1, 24542) = 2531.98, $p < .001$), the remaining demographic and LSI-OR measures in block two ($R^2 =.137$; F (8,24535) = 486.86, $p < .001$) increased R^2 in a minimal (change in $R^2 = .043$) but significant way, F_{change} (7, 24535) = 176.59, $p < .01$), with personal problems ($B = .058$, $p < .001$), history of perpetration ($B = .031$, $p < .001$), gender-female ($B = -.074$, $p < .001$), responsivity ($B = .051$, $p < .001$) and age ($B = .003$, $p < .001$) being significant factors (Table 18).

In order to assess the wisdom of using the above noted demographic and LSI-OR variables in exercising the override function, the predictor variables from the preceding multiple regressions were then applied, to general recidivism as the dependent variable. As was the case in the previous analyses, the general risk/need score was applied in the first block, followed by the remaining demographic and other LSI-OR measures and the analyses were performed separately on the sexual offender and nonsexual offender samples. These results were most revealing in that variables that contributed incrementally, beyond the general risk/need score, to the predicted recidivism were frequently not the same as those that contributed incrementally, beyond the general risk/need score, to the use of the override and vice versa. For sexual offenders, only history of perpetration ($B = .032$, $p < .01$), responsivity ($B = -.019$, $p < .10$), and age ($B = -.007$, $p < .001$) contributed incrementally beyond the general risk/need score to the prediction of general recidivism (Table 19). Consequently, responsivity, which was associated with a decrease in recidivism, was associated with use of the override to increase risk rating, while age, which was associated with a decrease in recidivism, was not associated with use of the override. Conversely, history of perpetration was associated both with recidivism and marginally with an increase in rated risk.

For nonsexual offenders, personal problems ($B = .019$, $p < .001$), prison experience ($B = .032$, $p < .001$), gender-female ($B = -.033$, $p < .001$), social, health and mental health ($B = -.006$, $p < .001$), responsivity ($B = -.016$, $p < .001$) and age ($B = -.004$, $p < .001$) contributed incrementally beyond the general risk/need score to the prediction of recidivism (Table 20). Consequently, history of perpetration was related to incremental increases in risk rating but was unrelated to the incremental prediction of recidivism. While being female was related both to decreases in risk rating and recidivism, both age and responsivity were related to decreases in recidivism but increases in risk rating.

Finally, the relationship between individual items and change in risk level, using the override function, was examined while controlling for total risk. Particular attention was paid to Sections B, F and G because the content of these sections might be used to influence assessors' decision to override the original risk level and any such decisions may or may not be justified empirically.

Among Specific Risk/Need (Section B) items, Inappropriate Sexual Activity (B1.8), was correlated with increases in risk level for sexual offenders, but not nonsexual offenders (.19 and .04, respectively) when controlling for total risk score. However, this item was negatively correlated with general, violent and sexual recidivism (-.19, -.12, and -.06, respectively) for sexual offenders, but not nonsexual offenders, suggesting it was inappropriately being used to

influence assessors' use of the override for sexual offenders. Secondly, Sexual Assault – Extrafamilial (B2.1) was correlated .10 with increases in the risk level, while controlling for total risk score, for sexual offenders, but not nonsexual offenders. However, it was unrelated to general, violent and sexual recidivism for the sexual offender sample (.03, .04, and .03, respectively). This latter finding may be considered unexpected, but nonetheless suggests another influence on assessors' use of the override for sexual offenders which is unsubstantiated.

Among Other Client Issues (Section F) items, Shy/Withdrawn (F1.8) and Diagnosis of Psychosis (F1.9) were both correlated (.06 and .06) with increases in risk level for the sexual offender sample while controlling for total risk score, but were not, or were less so, for the nonsexual offender sample (.00 and .03). However, neither was related to general or sexual recidivism and only minimally to violent recidivism (.04) for the sexual sample and minimally to general recidivism (.02) for the nonsexual offender samples, suggesting these items had an inappropriate influence on the override with sexual offenders.

Among Responsivity items (Section G), Interpersonally Anxious (G3) was the most strongly correlated item with increases in risk level among sexual offenders (.11) while controlling for the total risk/needs score. It was also correlated with general recidivism (.08), although not for violent or sexual recidivism. This suggests the item is making an appropriate contribution to the use of the override.

Discussion

This study examined the applicability of the LSI-OR on sexual offenders. It did so by comparing the predictive validity of the instrument over an average follow-up of 3.8 years, on a large cohort of Ontario provincial sexual offenders and compared the results of these validities to those from the balance of the cohort, the nonsexual offenders. Three measures of recidivism were employed general, violent and sexual, as well as an offense (recidivism) severity scale, developed by the ministry. The predictive validity of individual items in the context of the current investigation was also explored as was the role of structured professional judgement (SPJ) in augmenting the risk/need assessment and the occasions of its usage.

Predictive Validity of LSI-OR with Sexual Offenders

In terms of demographics, there were some reported differences between the sex offenders and nonsexual offenders. In this study, sex offenders were older than nonsexual offenders, were more likely to be male, and more likely to be Aboriginal than nonsexual offenders. Sex offenders also had a higher index offence severity, which was expected due to the high ranking assigned to sex offences, and were higher on the LSI-OR score and subscale measures. In addition, sex offenders scored higher on level of risk change, indicating that the assessors used the override feature to increase the risk level of sex offenders significantly more than nonsexual offenders. In terms of recidivism, it was found that sexual offenders had a higher rate of general reoffending than nonsexual offenders, and they reoffended more quickly than nonsexual offenders. However, there were no differences between violent and sexual recidivism between the sexual and nonsexual offenders.

Despite these demographic differences, the analyses in this study have strengthened the argument that the LS family of risk assessment instruments can be used reliably and validly in the assessment of sexual offenders. The high rate of general recidivism found for the sex offender sample, as well as the similar findings between the sex offender and nonsexual offender samples in examining the LS and recidivism have helped to illustrate the ability of the LS in sex offender risk assessment. Alpha levels were strong for analyzing internal consistency for all offender groups. In fact, there were slightly, but consistently stronger alpha coefficients with the

sexual offender sample. Correlations with the LSI-OR were strongest for general recidivism, followed by violent recidivism and sexual recidivism. There was no difference between sex and nonsexual offenders. Sources of the LSI-OR's predictive validity for general recidivism on the complete sample and the sexual offenders are reflected in the coefficients from the central eight domains. The correlations with general recidivism were higher for sexual offenders than nonsexual offenders on all domains except substance abuse. However, as was the case for the general risk/needs score, this pattern did not carry over to the prediction of violent or sexual recidivism.

Analyses of subgroups of sexual offenders revealed similar patterns. For example, the general risk/need score correlated highly with general recidivism for both Aboriginal and Nonaboriginal offenders. The assessment of the predictive validity of the LSI-OR with female sexual offenders was hampered by the small sample. However, significant findings were found for the prediction of general recidivism on the general risk/need total score and on two domains, substance abuse and antisocial pattern. The central eight domains and the other LSI-OR sections also predicted general recidivism well, but less so for both violent and sexual recidivism.

Finally, the item analysis of predictive validity of the LSI-OR general risk/need items on the sexual offense sample was impressive. Item correlations with general recidivism were particularly high and were, if fact, higher for sexual offenders than nonsexual offenders. However, it was unexpected to find that the reverse was true for the prediction of sexual recidivism. Item correlations from other sections of the LSI-OR, particularly Section B, (e.g., clear Problems with Compliance and Escape and UAL) and perhaps Section G (Motivation as a Barrier), may lead to hints as to how one might ameliorate difficulties with the override provision. However, the incremental predictive validity of these items should be assessed in a replication sample prior to making specific prescriptions about their use.

Structured Professional Judgment with the LSI-OR

The effect of the override was examined by comparing the predictive validity of the initial and final risk levels. Two relatively small, but consistent findings were observed. One, there was a decrease in predictive validity across all comparisons. This included sex offenders and nonsex offenders over three outcome measures (general recidivism, violent recidivism and sexual recidivism) and in both the correlation and ROC analyses. Secondly the decrement was larger for the sex offender sample on all three measures of recidivism. Since their predictive validities were very similar to those for nonsexual offenders initially, therefore, they were consistently lower than those for nonsexual offenders on the final risk level. Moreover, as evidenced by the nonoverlapping 95% confidence intervals, the decrement in validity was significant for general and violent recidivism, although all predictive validities remained highly significant at $p < .001$.

These findings triggered further investigation into the nature of the override as it was used with this sample of sexual offenders. First, the pattern of initial and final risk level revealed that very few sex offenders were moved to a lower risk level, specifically 2% of high risk sex offenders and 7% of very high risk offenders. However, many sex offenders were raised to a higher risk level. This included 65% of very low risk offenders and low risk offenders, 36% of medium risk offenders, and 5% of high risk offenders.

Further analyses attempted to determine possible sources or at least contributing factors to use of the override. Because there was a strong correlation between the LSI-OR total score and use of the override (low scores were associated with increases in risk level), statistical measures were invoked to control for the LSI-OR total score, which generated some intriguing

findings that may give some glimpse into how practitioners accommodate their own particular 'theories' about sex offender risk. In particular, while controlling for over all risk, criminal history was negatively associated with increases in risk, while procriminal attitudes and antisocial pattern were positively associated with increases in risk. Quite possibly, assessors suspect that the LSI-OR underestimates the risk presented by sexual offenders who do not have an extensive criminal history. Interestingly, the same kind of adjustment to risk was not evidenced among nonsex offenders. Conversely, it appears that assessors may not believe that the presence of antisocial attitudes and an antisocial pattern are not given enough weight in the LSI-OR scoring scheme and hence tend to increase their risk level if these two domains are high, a finding that was also found among nonsexual offender assessments.

Both subsections of the Special Risk/Needs, Personal problems and History of Perpetration, were also correlated with overriding to a higher risk level, as they were with nonsexual offenders. This finding is quite expected as the LSI-OR manual indicates that these factors are possible reasons for exercising the override feature. However, it was somewhat surprising that the Special Responsivity section was also positively correlated with the override function, although it was for nonsex offenders as well, as was the Social, Health and Mental Health Section, which was only minimally correlated for nonsex offenders. These findings were augmented by a multiple regression analysis of LSI-OR section risk scores on the override change variable, with very comparable results, indicating that, after the total risk/need score is taken into consideration, personal problems, history of perpetration, social health and mental health issues, and responsivity all contribute positively to assessors' decisions to increase offender risk level.

The item analysis in relation to use of the override, although exploratory, appears to have shed some light on what may prove to be unadvised use of the override, particularly for sexual offenders. In particular, a few items were notably correlated with the use of the override when controlling for the total risk/need score. The findings that inappropriate sexual activity and extrafamilial sexual assault from Section B were negatively correlated with all three measures of recidivism may seem counter intuitive and appear to be misapplied to use of the override with sexual offenders. Similarly, being shy and withdrawn or having a diagnosis of psychosis was correlated with an increase in risk level among sexual offenders, while controlling for total risk, a decision which is not supported from the data. On the other hand, being interpersonally anxious, although a responsivity item, appears to be used appropriately to increase risk level of sexual offenders. However, the effects of these items on the use of the override, must be described as 'small,' although they are very reliable given the sample size. Nonetheless, all of these analyses are preliminary and should be replicated prior to making pronouncements to users in the field.

In sum, it appears that other complicating factors in the sexual offenders' lives may be related to augmenting the risk level of sexual offenders. It is unknown whether this is a systematic conscious decision by the assessors, or if these factors contribute to an unspecified sense of uneasiness that leads assessors to increase their risk level. In defense of this practice, one is reminded of the substantial correlations that that these sections had with recidivism. What is curious is that they were still considered to be contributing to risk even after the LSI-OR total score was determined.

With respect to demographic characteristics, age and ethnicity were unrelated to use of the override, while being female was correlated with lowering the risk level. This latter finding,

which was also found with nonsex offenders, is not surprising in light of the continued controversy and speculation that risk assessment tools generally disadvantage women offenders.

For sexual offenders, increases in risk level by means of the override was not correlated with age or race (Aboriginal) when controlling for risk, although it was negatively related to being female. For nonsexual offenders, controlling for risk, increases in risk level was not correlated with being Aboriginal, but it was correlated with age and negatively with being female. These results were most revealing in that variables that contributed incrementally, beyond the general risk/need score, and independent of each other, to the use of the override were not always the same as those that contributed to the prediction of recidivism. Since their zero order correlations with recidivism were significant and substantial and their scores are not used to determine a sex offender's general degree of general, it is understandable how assessors might use personal problems and social, health and mental health problems to make an adjustment to the final assessment, typically by raising risk level. However, the finding that these measures did not add any incremental validity to the prediction of recidivism, although others such as perpetration history and responsivity did, it becomes apparent how the final risk level correlates less well with recidivism than the initial risk level. In our view, these findings illustrate the potential shortcomings of using structured clinical judgment to augment a statistically based risk/need assessment scheme.

The use of clinical judgment or professional discretion to augment the results of a statistically based risk assessment is particularly relevant in the assessment of sexual offender risk. Increasingly, decisions to detain sexual offenders are being made at the judicial level through special provision in law such as the involuntary commitment of sexual predators in at least 17 US states (notably, Washington, California and Kansas; Washington State Institute for Public Policy, 2005) and the Dangerous Offender provisions throughout Canada, which are designed for and applied primarily (77%) to sexual offenders (Public Safety Canada, 2010). Consequently, professionals are increasingly being called on to provide expert testimony in such cases, all of which has forced clinicians and researches to ask, can we not do better? In this context, hope has been renewed for the potential for individual, case specific, professional judgment to augment the predictive accuracy of the many statistical tools that have been designed for this very purpose. Although few experts would advocate for a strictly clinical judgment approach, at least two kinds of ways to combine the statistical with the clinical approaches have been touted. Structured professional judgment has an extensive history and has proven to be effective in the prediction of general and domestic violence [e.g. HCR-20 (Webster, Douglas, Eaves & Hart, 1997); Spousal Assault Risk Assessment Guide (SARA; Kropp, Hart, Webster, & Eaves, 1999; Kropp & Hart, 2000); Brief Spousal Assault Form for the Evaluation of Risk (B-SAFER; Kropp & Hart, 2004)] and has been promoted for the assessment of sexual offender risk assessment (e.g. Sexual Violence Risk – 20 (SVR-20; Boer, Hart, Kropp & Webster, 1997) and Risk for Sexual Violence Protocol (RSVP; Hart, Kropp, Laws, Klaver, Logan, & Watt, 2003). A second approach that has been suggested, although largely untested, is to consider individual or unique circumstances and patterns of the offender to augment the statistically based prognostications in the hope of boosting the predictive validity of the final assessment.

Consequently, a search has begun for items and techniques that might create incremental predictive validity in the prediction of sexual offender recidivism. This approach is given further impetus from norms studies that have generated variable recidivism rates with a common instrument. In fact, in their analysis of differing recidivism rates on the Static-99, Helmus,

Hanson and Thornton (2009) suggested that the assessor must make a determination as to where along a range of recidivism rates that a specific offender is likely to fall. Some interpret this to mean that the assessor should look for "red flags" to specify an offender's degree of risk more accurately and to criticize the exclusive use of risk tools because they fail to meet the standards of scientific rigor (Sreenivasan, Weinberger, Frances & Cusworth-Walker, 2010). Others make no such inference, rather they believe that the assessor should use the norm group to which the offender is the best fit and use these norms without making any personal or professional judgments about placement of an offender along a range of projected recidivism rates (Abbott, 2011). Sadly, evidence for the incremental predictive validity of structured clinical judgment to actuarially-based sex offender risk assessment is absent.

It is no surprise, therefore, to learn that researchers are often perceived as giving mixed messages to practitioners. Although Hanson and Morton-Bourgon (2009) point out that the predictive validity of professional judgment in the prediction of sexual offender recidivism is weak, they may be perceived as giving tacit approval to professional judgment by noting that currently it may be "unavoidable."

Some supporting evidence may be derived from Hanson and colleagues' effort to improve their assessment of dynamic factors in the STABLE-2000 to a more easily scored version in the STABLE-2007 (Hanson, Harris, Scott & Helmus, 2007). They have demonstrate incremental predictive validity over the Static-99 in a Canadian sample of sexual offenders, while Eher and colleagues (Eher, Matthes, Schilling, Haubner-MacLean & Retternberger, in press) have produced some modest support for the Static-99/Stable-2007 combination in a sample of German sexual offenders. However, it is important to point out that the Stable-2007 is a risk assessment tool and differs from the Static-99 in that it consists of dynamic, sexual offender criminogenic needs on which offenders are rated as opposed to being scored mechanically. But it is neither a clinical judgment nor a structured professional judgment protocol. In fact, the Static-99/Stable-2007 battery, collectively, is reminiscent of the LSI-OR as a combined risk/need assessment. Coming a step closer to assessing the contribution or more traditional clinical judgment, Eher and colleagues demonstrated that a psychiatric diagnosis of narcissistic personality disorder supplemented the predictive validity of the Static-99 and Stable-2007, but other diagnoses, including exclusive pedophilia, exhibitionism, voyeurism and paranoid personality disorder, made no such contribution (Eher, Retternberger, Matthes, & Schilling, 2010). Finally, exasperated with the traditional linear, "variable-oriented" perspective to sex offender risk assessment, Lussier and Davis (2011) have taken a "person-oriented" perspective in their effort to consider both static and dynamic predictors. Using a group-based modeling strategy, they revealed various trajectories of offending over time, which might then be used for differential predictions based on offender membership to a group.

Limitations and Further Directions

Four limitations of the current investigation merit consideration. Two relate to measurement issues and two relate to inferences which may or may not be drawn from this study. First, since the LS data were derived from an existing database of the agency, it was impossible to determine the accuracy of LS as the predictor variable. Considering the fact that numerous probation officers and correctional staff with various years of service and familiarity with the LS instruments were responsible for conducting and recording the LS raw data, one can only assume there was some unknown amount of measurement error in the LS assessments. The fact that the LS data were entered into an electronic database using specially designed LS software guarantees only that no logical or arithmetic errors were made in scoring the

instrument. Some offenders did have multiple assessments, sometimes by a second assessor. However, this was typically after some delay period (e.g. six months). Given the dynamic nature of LS and the agency policy that changes in offenders' circumstances should trigger a re-assessment, such a comparison would not be an accurate reflection of inter-rater reliability.

Secondly, the assessment of criminal recidivism as an outcome in the predictive analysis was based on internal agency re-contact with the cohort of offenders. This included all reconvictions in the province in which the agency was located. Consequently out of province reconvictions were not captured. The fact that Ontario covers a very large geographic area (one million square kilometres) and the majority of the population of 11.5 million resides in the central portions of the province (Attractions Canada, 2011), it is assumed that vast majority of reconvictions were captured in the agency's database. Regardless, the net effect of these two limitations in the data is to decrease the predictive validity estimates from their true value as they introduce some unknown portion of error variance into the predictor and outcome variables respectively.

Thirdly, the cohort was limited to provincial sexual offenders meaning that sexual who were sentenced to two years or more in custody were not included. As sentence length can be interpreted as a general measure of the severity of an offense (Quirk, Nutbrown & Renolds, 1991), the most serious offenders were not included. This truncation of sexual offenders has implications both for the validity statistics and their interpretation. The exclusion of federal sexual offenders may have reduced the heterogeneity of the sex offender cohort in terms of their degree of risk, in which case the currently reported findings would represent conservative estimates of association between the LSI-OR and recidivism. Elsewhere, in an examination of offenders generally, not simply sexual offenders, we found that including both federal and provincial offenders, inmates and probationers, increased the variance of the LS scores (Wormith, Olver, Stevenson & Girard, 2007).

Finally, the current study did not include any of the specialized sex offender recidivism prediction instruments. Consequently, we were unable to compare the predictive validity of the LS with that of a specialized sex offender tool on the same sample. Comparisons of predictive validities from other samples are problematic for a number of reasons. Moreover, we are unable to speculate about the potential merits of using both a general and sexual offender-specific risk assessment tool as part of an overall sex offender assessment protocol, as has been suggested by some researchers and clinicians (e.g., Simourd & Malcolm, 1998). This strategy remains of interest to us, in large part because it is now apparent that a sizeable portion of the sex offender population may be characterized as generally antisocial, such that their sexual offending is part of a broader pattern of antisocial behaviour. Findings from the current investigation that demonstrate the incidence of general and nonsexual violent offending amongst a large heterogeneous cohort of sexual offenders and the predictive validity of the LS to identify these offenders indicates that this line of research needs to be explored in a thorough and systematic fashion.

Conclusion

This study was undertaken to assess the appropriateness and value of using a general risk/need assessment, such as the LSI-OR, on a specialized offender population, namely sexual offenders. Results from the current study have supported the use of the LS family of instruments on sexual offenders as demonstrated through the predictive validity correlations and AUC values on a large extraction of sex offenders and comparing them to the remaining nonsexual offenders from the same cohort. Consequently sexual offenders should not be perceived or treated as being

unique from the offender population. Rather, they have many of the same criminogenic risks and needs as nonsexual offender and thus, would benefit from similar risk/need assessment as nonsexual offenders would.

Secondly, in examining the practice of structured professional judgement as offered to users of the LSI-OR by means of assessor override, it was revealed that the override did not improve risk prediction. In fact, it led to a slight deterioration in the instrument's predictive validity. Therefore, caution, perhaps more specific guidelines for continued use, and a written justification when it is used, are all recommended. Hopefully, these results will encourage assessors to be more cognizant of the impact of their assessments and provide appropriate rationale for applying an override. In terms of next steps, additional research is recommended, especially on the override or use of professional judgment to augment statistical/empirical based prediction.

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Table 1. Comparisons of sex offenders and nonsexual offenders on demographic characteristics, LSI-OR, and recidivism

	Sex Offender (SD)	Nonsexual Offenders (SD)	t-tests and Chi Squares
	Mean (SD) or N (%)	Mean (SD) or N (%)	
Demographic Variables			
Age	41.91 (12.66)	37.63 (11.57)	t (2157.92) = -14.30, $p < .001$
Offense Severity	18.34 (4.52)	15.42 (3.88)	t (2126.31) = -27.43, $p < .001$
Male	1849 (97.06)	19767 (80.53)	$\chi^2(1) = 323.28 = p < .001$
Female	56 (2.94)	4778 (19.47)	
Aboriginal	231 (12.15)	1461 (5.95)	$\chi^2(1) = 112.53, = p < .001$
Nonaboriginal	1674 (87.85)	23084 (94.05)	
LSI-OR Variables			
General Risk/Needs	16.53 (10.03)	12.09 (8.58)	t (2125.59) = -18.80, $p < .001$
Specific Risk/Needs	4.56 (3.12)	2.33 (2.19)	t (2051.87) = -30.59, $p < .001$
Strength	0.71 (1.50)	0.90 (1.65)	t (2277.66) = 5.29, $p < .001$
Initial Risk Level	3.06 (1.20)	2.52 (1.11)	t (26448) = -20.11 $p < .001$
Final Risk Level	3.60 (.98)	2.68 (1.06)	t (2264.65) = -39.00, $p < .001$
Risk Level Change	0.54 (.96)	0.16 (0.54)	t (1996.69) = -16.98, $p < .001$
Recidivism Variables			
General Reoffense	44.41 (0.50)	33.86 (0.47)	t (2180.55) = -8.96, $p < .001$
Violent Reoffense	12.34 (0.33)	12.63 (0.33)	t (26338) = 0.37, ns
Sexual Reoffense	3.73 (0.19)	3.17 (0.18)	t (2164.00) = -1.25, ns
Lapse Time	1247.64 (703.76)	1407.95 (636.36)	t (2152.64) = 9.64, $p < .001$

T-test, in most cases, equal variance not assumed.

Table 2. Sexual offender general and violent recidivism rates by race, gender and disposition

	General Recidivism (%)			Violent Recidivism (%)			Sexual Recidivism (%)		
	Total	**Aborig.**	**Non-Aborig.**	**Total**	**Aborig.**	**Non-Aborig.**	**Total**	**Aborig.**	**Non-Aborig.**
Total	44.4	64.9	41.6	12.3	15.6	11.9	3.7	6.1	3.4
Male	44.1	64.9	41.3	11.9	14.2	11.6	3.8	5.8	3.5
Female	53.6	66.7	52.0	26.8	66.7	22.0	1.8	16.7	0.0
Custodial	61.4	75.6	58.2	19.5	19.3	19.6	6.4	9.6	5.7
Male	61.4	75.4	58.1	19.5	18.7	19.7	6.6	9.7	5.8
Female	62.5	100.0	60.0	18.8	100.0	13.3	0.0	0.0	0.0
Conditional	26.6	39.1	25.8	7.2	8.7	7.1	1.1	0.0	1.2
Male	26.4	40.9	25.4	6.5	9.1	6.3	1.2	0.0	1.3
Female	37.5	0.0	42.9	37.5	0.0	42.9	0.0	0.0	0.0
Probation	36.8	53.4	35.2	8.1	11.0	7.9	2.4	1.4	2.5
Male	36.2	52.2	34.6	7.3	7.2	7.3	2.4	0.0	2.6
Female	53.1	75.0	50.0	28.1	75.0	21.4	3.1	25.0	0.0

Aborig. = Aboriginal

Table 3. Alpha coefficients for total LSI-OR and subcomponents for sex offenders, nonsexual offenders and all offenders

Scale (number of items)	Sex-Offender (n=1905)	Nonsexual Offender (n=24545)	Total (n=26450)
General Risk/Needs (43)	.93	.92	.92
General Risk/Needs (40)	.93	.91	.91
Criminal History (8)	.87	.87	.87
Education / Employment (9)	.84	.84	.84
Family / Marital (4)	.42	.38	.39
Leisure / Recreation (2)	.52	.42	.43
Companions (4)	.68	.62	.63
Procriminal Attitudes (4)	.62	.59	.60
Substance Abuse (8)	.86	.84	.84
Antisocial Pattern (4)	.54	.50	.51

Number in (brackets) indicated number of items.

Table 4. Correlations between LSI-OR total and section scores with general, violent and sexual recidivism for all offenders, sexual offenders and nonsexual offenders

LSI-OR Section	General Recidivism			Violent Recidivism			Sexual Recidivism		
	All Offenders (n=26450)	Sex Offenders (n=1905)	Nonsex Offenders (n=24545)	All Offenders (n=26450)	Sex Offenders (n=1905)	Nonsex Offenders (n=24545)	All Offenders (n=26450)	Sex Offenders (n=1905)	Nonsex Offenders (n=24545)
General Risk/Needs	.44***	.47***	.43***	.29***	28***	.29***	.19***	.17***	.19***
Criminal History	.42***	.48***	.41***	.28***	.29***	.28***	.18***	.16***	.18***
Education/Employment	.31***	.34***	.31***	.22***	.24**	.22***	.14***	.14***	.14***
Family/Marital	.18***	.21***	.17***	.10***	.11***	.10***	.06***	.08***	.06***
Leisure/Recreation	.25***	.30***	.24***	.17***	.16***	.17***	.11***	.11***	.11***
Companions	.32***	.37***	.31***	.22***	.24***	.22***	.14***	.15***	.14***
Procriminal Attitudes	.25***	.28***	.24***	.15***	.15***	.16***	.11***	.11***	.11***
Substance Abuse	.30***	.34***	.29***	.16***	.18***	.16***	.12***	.09***	.12***
Antisocial Patterns	.34***	.37***	.33***	.23***	.23***	.23***	.16***	.16***	.16***
Total Strengths	-.12***	-.12***	-.12***	-.07***	-.05*	-.08***	-.04***	-.05*	-.04***
Specific risk/Needs	.33***	.37***	.32***	.16***	.15***	.16***	.13***	.11***	.13***
Personal Problems	.31***	.32***	.31***	.16***	.12***	.18***	.12***	.08***	.13***
Perpetration History	.25***	.34***	.23***	.10***	.15***	.09***	.09***	.12***	.09***
Prison Experience	.28***	.30***	.28***	.21***	.21***	.22***	.16***	.12***	.17***
Social, Health, Mental Health	.19***	.23***	.18***	.13***	.12***	.134***	.07***	.09***	.06***
Barrier to Release	.23***	.22	.22***	.16***	.16***	.17***	.12***	.09***	.13***
Responsivity	.19***	.18***	.18***	.10***	.07***	.10***	.07***	.12***	.07***

* p < .05, ** p < .01, *** p < .001

Table 5. Sex offender correlations between LSI-OR total and section scores with recidivism presented
by race

LSI-OR Section	General Recidivism		Violent Recidivism		Sexual Recidivism	
	Aboriginal (n=231)	Nonaboriginal (n=1674)	Aboriginal (n=231)	Nonaboriginal (n=1674)	Aboriginal (n=231)	Nonaboriginal (n=1674)
General Risk/Needs	.47***	.45***	.16*	.31***	.18**	.16***
Criminal History	.49***	.46***	.20**	.30***	.18**	.15***
Education/Employment	.33***	.31***	.09	.26***	.14*	.13***
Family/Marital	.28***	.18***	.10	.10***	.13*	.06*
Leisure/Recreation	.28***	.28***	.15*	.15***	.15*	.09***
Companions	.28***	.35***	.12	.26***	.16*	.14***
Procriminal Attitudes	.36***	.25***	.10	.16***	.10	.11***
Substance Abuse	.35***	.31***	.09	.19***	.09	.08***
Antisocial Patterns	.41***	.34***	.12	.25***	.16*	.15***
Total Strengths	-.11	.12***	.01	-.06*	-.03	-.06*
Specific risk/Needs	.38***	.34***	.10	.16***	.19**	.08***
Personal Problems	.33***	.29***	.08	.12***	.18**	.04
Perpetration History	.36***	.30***	.120	.16***	.16*	.10***
Prison Experience	.27***	.28***	.17*	.22***	.24***	.09***
Social, Health, Mental Health	.30***	.18***	.07	.12***	.19**	.06*
Barrier to Release	.30***	.18***	.14*	.15***	.22***	.06*
Responsivity	.26***	.13***	.12	.06*	.24***	.07**

* p < .05, ** p < .01, *** p < .001

Table 6. Sex offender correlations between LSI-OR total and section scores and recidivism by gender

LSI-OR Section	General Recidivism		Violent Recidivism		Sexual Recidivism	
	Male (n=1849)	Female (n=56)	Male (n=1849)	Female (n=56)	Male (n=1849)	Female (n=56)
General Risk/Needs	.47***	.36**	.28***	.10	.17***	.12
Criminal History	.48***	.24	.30***	.06	.16***	.06
Education/Employment	.34***	.26	.24***	.09	.14***	.10
Family/Marital	.22***	-.06	.10***	.04	.08***	.10
Leisure/Recreation	.30***	.13	.16***	-.16	.11***	-.10
Companions	.37***	.19	.24***	-.01	.15***	.03
Procriminal Attitudes	.28***	.24	.15***	.20	.11***	.02
Substance Abuse	.34***	.35***	.18***	.04	.10***	.15
Antisocial Patterns	.37***	.31*	.23***	.17	.16***	.10
Total Strengths	-.12***	.03	-.05*	-.08	-.06*	.04
Specific risk/Needs	.38***	.18	.16***	-.02	.11***	.22
Personal Problems	.32***	.12	.12***	-.04	.08***	.09
Perpetration History	.35***	.20	.16***	.02	.12***	.29*
Prison Experience	.31***	.03	.22***	-.04	.12***	.11
Social, Health, Mental Health	.23***	.16	.11***	.15	.10***	.03
Barrier to Release	.22***	.31*	.15***	.27*	.09***	.26
Responsivity	.18***	-.01	.08***	-.07	.12***	-.04

* p < .05, ** p < .01, *** p < .001

Table 7. Sex offender correlations between LSI-OR total and section scores and recidivism by type of sentence

LSI-OR Section	General Recidivism			Violent Recidivism			Sexual Recidivism		
	Custody (n=733)	Conditional (n=349)	Probation (n=823)	Custody (n=733)	Conditional (n=349)	Probation (n=823)	Custody (n=733)	Conditional (n=349)	Probation (n=823)
General Risk/Needs	.45***	.41***	.34***	.27***	.23***	.17***	.17***	.06	.09**
Criminal History	.50***	.43***	.31***	.28***	.28***	.18***	.15***	.12*	.08*
Education/Employment	.30***	.21***	.24***	.25***	.12*	.14***	.16***	-.01	.06
Family/Marital	.19***	.15**	.13***	.07	.04	.07	.08*	.01	.04
Leisure/Recreation	.25***	.18***	.20***	.14***	.08	.07*	.12***	.01	.04
Companions	.32***	.36***	.24***	.20***	.29***	.13***	.14***	.13*	.07
Procriminal Attitudes	.30***	.16**	.12***	.15***	.10*	.02	.12***	-.02	.03
Substance Abuse	.30***	.24***	.24***	.13***	.11*	.12***	.05	.03	.08*
Antisocial Patterns	.34***	.30***	.24***	.22***	.18***	.10**	.15***	.03	.09**
Total Strengths	-.08***	-.09	-.08*	-.10**	-.05	.03	-.06	-.06	-.02
Specific risk/Needs	.33***	.24***	.25***	.06	.09***	.10**	.04	.13*	.10**
Personal Problems	.25***	.19***	.19***	.02	.07	.07*	.02	.03	.05
Perpetration History	.32***	.19***	.21***	.09*	.08	.09**	.04	.20***	.12***
Prison Experience	.21***	.12***	.11***	.14***	.28***	.05	.07	.19***	.02
Social, Health, Mental Health	.18***	.10	.16***	.03	.10	.13***	.07	.05	.06
Barrier to Release	.06	.09	.11***	.05	.06	.12***	.04	-.01	.02
Responsivity	.18***	.07	.06	.04***	.04	.00	.13***	.07	.02

* p < .05, ** p < .01, *** p < .001

Table 8. Correlations between LSI-OR initial and final risk level with general, violent and sexual recidivism for sexual offenders

Sample	General Recidivism		Violent Recidivism		Sexual Recidivism	
	Initial Risk Level	Final Risk Level	Initial Risk Level	Final Risk Level	Initial Risk Level	Final Risk Level
Entire Sample	.45***	.26***	.27***	.18***	.16***	.11***
Males	.45***	.26***	.27***	.18***	.16***	.11***
Females	.29*	.15	.07	.16	.05	.05
Aboriginal	.40***	.22***	.12	.10	.12	.11
Males	.39***	.33***	.13	.11	.13	.11
Females	.93**	.63	.93**	.63	n/a	n/a
Nonaboriginal	.43***	.22***	.29***	.19***	.16***	.10***
Males	.43***	.22***	.30***	.19***	.16***	.10***
Females	.24	.10	.00	.12	.29	.20
Conditional Sentence	.37***	.12*	.22***	.10	.06	.02
Males	.36***	.11*	.19***	.08	.06	.03
Females	.43	.52	.44	.52	n/a	n/a
Probation	.32***	.12***	.16***	.07*	.09*	.02
Males	.32***	.12***	.15***	.06	.08*	.02
Females	.24	.25	.07	.11	.12	.11
Custody	.43***	.34***	.26***	.22***	.16***	.14***
Males	.43***	.34***	.26***	.22***	.16***	.14***
Females	.19	-.18	.02	.23	n/a	n/a

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 9. ROC coefficients for LSI-OR total and section scores with general and violent recidivism for sexual offenders and nonsexual offenders[1,2]

LSI to OR Section	General Recidivism			Violent Recidivism			Sexual Recidivism		
	Sex Offenders (n=1905)	Nonsexual Offenders (n=24545)	Total (n=26450)	Sex Offenders (n=1905)	Nonsexual Offenders (n=24545)	Total (n=26450)	Sex Offenders (n=1905)	Nonsexual Offenders (n=24545)	Total (n=26450)
General Risk/Needs	.77 (.75 to .79)	.76 (.75 to .76)	.76 (.75 to .77)	.74 (.71 to .77)	.73 (.72 to .74)	.73 (.72 to .74)	74 (.69 to .80)	.77 (.75 to .78)	.77 (.75 to .78)
Criminal History	.78 (.76 to .80)	.73 (.72 to .74)	.74 (.73 to .74)	.75 (.72 to .78)	.72 (.71 to .73)	.72 (.71 to .73)	.74 (.69 to .80)	.76 (.74 to .77)	.75 (.74 to .77)
Education/Employment	.69 (.67 to .72)	.68 (67 to .69)	.68 (.68 to .69)	.70 (.67 to .74)	.68 (.67 to .69)	.68 (.67 to .69)	.71 (.65 to .77)	.71 (.69 to .73)	.71 (.69 to .72)
Family/Marital	.62 (.59 to .64)	.60 (.59 to .60)	.60 (.59 to .61)	.59 (.55 to .63)	.58 (.57 to .59)	.58 (.57 to .59)	.61 (.54 to .68)	.60 (.58 to .62)	.60 (.58 to .62)
Leisure/Recreation	.66 (.64 to .69)	.64 (.63 to .65)	.64 (.64 to .65)	.63 (.59 to .67)	.64 (.63 to .65)	.64 (.63 to .65)	.65 (.59 to .71)	.66 (.64 to .68)	.66 (.64 to .68)
Companions	.71 (.68 to .73)	.68 (.67 to .68)	.68 (.67 to .69)	.70 (.67 to .74)	.68 (.67 to .69)	.68 (.67 to .69)	.71 (.66 to .77)	.70 (.68 to .72)	.70 (.69 to .72)
Procriminal Attitudes	.66 (.63 to .68)	.63 (.62 to .64)	.63 (.63 to .64)	.63 (.59 to .66)	.62 (.61 to .63)	.62 (.61 to .63)	.66 (.59 to .72)	.64 (.62 to .66)	.64 (.62 to .66)
Substance Abuse	.70 (.67 to .72)	.67 (.66 to .68)	.67 (.66 to .68)	.65 (.62 to .69)	.63 (.62 to .64)	.63 (.62 to .64)	.64 (.58 to .70)	.68 (.66 to .70)	.68 (.66 to .69)
Antisocial Patterns	.70 (.68 to .72)	.67 (.66 to .67)	.67 (.66 to .68)	.69 (.65 to .72)	.66 (.65 to .67)	.66 (.65 to .67)	.71 (.65 to .77)	.70 (.68 to .72)	.70 (.68 to .72)
Total Strengths[3]	.57 (.54 to .60)	.56 (.55 to .57)	.56 (.55 to .57)	.56 (.52 to .60)	.56 (.55 to .57)	.56 (.55 to .57)	.58* (.51 to .64)	.55 (.54 to .57)	.56 (.54 to .57)
Specific risk/Needs	.71 (.69 to .74)	.68 (.67 to .68)	.68 (.68 to .69)	.64 (.60 to .68)	.63 (.62 to .64)	.62 (.61 to .63)	.66 (.60 to .72)	.68 (.66 to .70)	.68 (.66 to .70)
Personal Problems	.68 (.65 to .70)	.67 (.66 to .68)	.67 (.67 to .68)	.61 (.57 to .65)	.64 (.63 to .65)	.63 (.62 to .64)	.62 (.56 to .68)	.68 (.66 to .70)	.68 (.66 to .70)
Perpetration History	.68 (.66 to .71)	.61 (.60 to .62)	.62 (.61 to .63)	.63 (.59 to .67)	.55 (.54 to .56)	.56 (.55 to .57)	.66 (.60 to .73)	.61 (.59 to .63)	.61 (.59 to .64)
Prison Experience	.66 (.63 to .68)	.62 (.61 to .63)	.62 (.62 to .63)	.68 (.64 to .71)	.63 (.62 to .64)	.63 (.62 to .64)	.68 (.61 to .74)	.67 (.65 to .70)	.67 (.65 to .70)
Social, Health, Mental Health	.62 (.60 to .65)	.61 (.60 to .62)	.61 (.60 to .62)	.60 (.56 to .64)	.62 (.61 to .63)	.61 (.60 to .62)	.62 (.56 to .70)	.60 (.58 to .62)	.61 (.59 to .63)
Barrier to Release	.59 (.57 to .62)	.56 (.56 to .57)	.57 (.56 to .58)	.60 (.56 to .64)	.57 (.56 to .58)	.57 (.56 to .58)	.60** (.53 to .68)	.60 (.58 to .62)	.60 (.58 to .62)
Responsivity	.60 (.57 to .62)	.60 (.60 to .61)	.60 (.60 to .61)	.56 (.52 to .60)	.58 (.57 to .59)	.58 (.57 to .59)	.64 (.58 to .71)	.60 (.58 to .62)	.60 (.58 to .62)

[1] All *p*'s < .001. except *p=.031 and **, *p* =.003; [2] Confidence intervals are in brackets; [3] The coding of recidivism was reversed for Total Strengths in order to predict success as opposed to recidivism.

Table 10. Mean survival time (days), standard error, and 95% confidence interval for general
recidivism presented by initial and final risk level for sexual offenders and nonsexual offenders

	Mean survival time	Standard Error	95% confidence Interval
Sexual offenders (N = 1905)			
Initial Risk Level			
Very Low	1715.06	23.97	1668.09 to 1762.04
Low	1530.54	27.54	1476.56 to 1584.52
Medium	1325.88	27.27	1272.43 to 1397.32
High	1008.43	33.94	941.91 to 1074.95
Very High	633.61	40.70	553.85 to 713.38
Final Risk Level			
Very Low	1682.45	44.99	1594.27 to 1770.63
Low	1452.23	49.03	1356.13 to 1548.34
Medium	1365.52	27.99	1310.67 to 1420.37
High	1265.84	23.82	1219.15 to 1312.53
Very High	993.91	41.31	692.95 to 854.87
Nonsexual Offenders (N = 24545)			
Initial Risk Level			
Very Low	1697.32	5.41	1686.72 to 1707.92
Low	1585.92	5.86	1574.45 to 1597.40
Medium	1346.24	7.57	1331.41 to 1361.06
High	1001.31	11.88	978.02 to 1024.60
Very High	625.97	18.66	589.40 to 662.54
Final Risk Level			
Very Low	1693.68	6.18	1681.56 to 1705.80
Low	1587.36	6.57	1574.48 to 1600.25
Medium	1411.78	6.31	1399.42 to 1424.15
High	1047.76	11.45	1025.32 to 1070.19
Very High	649.29	19.65	610.79 to 687.79

Table 11. Mean survival time (days), standard error, and 95% confidence interval for violent recidivism presented by initial and final risk level for sexual offenders and nonsexual offenders

	Mean survival time	Standard Error	95% confidence Interval
Sexual offenders (N = 1905)			
Initial Risk Level			
Very Low	1808.96	9.13	1791.08 to 1788.39
Low	1774.11	13.33	1747.99 to 1751.80
Medium	1689.20	18.13	1653.67 to 1646.75
High	1502.01	31.25	1440.75 to 1414.83
Very High	1203.39	56.72	1091.22 to 1123.29
Final Risk Level			
Very Low	1820.83	4.14	1812.71 to 1828.95
Low	1775.70	21.92	1732.73 to 1818.66
Medium	1699.30	18.39	1663.25 to 1735.35
High	1632.58	17.70	1597.88 to 1667.27
Very High	1330.37	47.88	1236.53 to 1424.21
Nonsexual Offenders (N = 24545)			
Initial Risk Level			
Very Low	1781.89	3.32	1775.39 to 1788.39
Low	1744.52	3.72	1751.80 to 1751.80
Medium	1635.44	5.77	1646.75 to 1646.75
High	1391.39	11.96	1367.95 to 1414.84
Very High	1075.11	26.11	1023.92 to 1126.29
Final Risk Level			
Very Low	1777.09	3.93	1769.38 to 1784.80
Low	1737.84	4.34	1729.34 to 1746.35
Medium	1666.36	4.61	1657.33 to 1679.40
High	1430.83	11.06	1409.15 to 1452.51
Very High	1112.86	26.78	1060.37 to 1165.34

Table 12. Mean survival time (days), standard error, and 95% confidence interval for sexual recidivism presented by initial and final risk level for sexual offenders and nonsexual offenders

	Mean survival time	Standard Error	95% confidence Interval
Sexual offenders (N = 1905)			
Initial Risk Level			
Very Low	1818.57	6.41	1806.00 to 1834.14
Low	1807.11	7.97	1791.49 to 1822.73
Medium	1792.00	9.86	1772.68 to 1811.32
High	1709.62	21.00	1668.47 to 1750.77
Very High	1573.15	46.73	1481.56 to 1664.75
Final Risk Level			
Very Low[1]			
Low	1803.50	15.12	1773.87 to 1833.13
Medium	1787.16	10.81	1765.98 to 1808.35
High	1764.51	10.74	1743.46 to 1785.16
Very High	1633.51	36.10	1562.75 to 1704.26
Nonsexual Offenders (N = 24545)			
Initial Risk Level			
Very Low	1818.69	1.29	1816.16 to 1821.23
Low	1808.09	1.76	1804.64 to 1811.53
Medium	1781.64	3.03	1775.70 to 1787.58
High	1686.70	8.09	1670.85 to 1702.55
Very High	1477.44	23.99	1430.43 to 1524.46
Final Risk Level			
Very Low	1818.55	1.49	1815.64 to 1821.46
Low	1809.00	1.91	1805.25 to 1812.76
Medium	1786.32	2.47	1781.49 to 1791.15
High	1698.59	7.35	1684.21 to 1712.97
Very High	1507.05	23.69	1460.62 to 1553.47

[1] All cases (N = 80) censored. Statistics not computed

Table 13. Summary of survival analyses initial and final risk levels (Log Rank (Mantel-Cox) overall and pairwise comparisons) for sexual offenders on general, violent and sexual recidivism

	Sexual Offenders (N = 1905)		Nonsexual Offenders (N = 24545)	
	Initial Risk	Final Risk	Initial Risk	Final Risk
General Recidivism				
Overall [1]	454.70***	146.42***	5259.91***	3967.58***
VL vs. L	17.98***	8.24**	205.79***	450.28***
VL vs. M	65.55***	15.55***	1205.88***	718.72***
VL vs. H	450.34***	23.85***	2967.69***	2152.16***
VL vs. VH	282.15***	75.21***	453.44***	3483.28***
L vs. M	29.63***	1.99	634.40***	325.84***
L vs. H	130.39***	8.85**	2340.61***	1758.91***
L vs. VH	302.72***	75.75***	3611.97***	2949.86***
M vs. H	52.67***	7.15**	649.35***	893.81***
M vs. VH	206.05***	143.50***	1504.39***	1821.76***
H vs. VH	52.48***	116.71***	278.87***	303.80***
Violent Recidivism				
Overall[1]	205.56***	86.73***	2643.50***	1875.28***
VL vs. L	2.12	1.21	61.75***	49.92***
VL vs. M	16.43***	5.51*	431.14***	233.29***
VL vs. H	54.75***	10.94***	1397.70***	952.64***
VL vs. VH	104.99***	29.86***	2269.12**	1647.29***
L vs. M	13.12***	4.05*	256.55***	104.16***
L vs. H	68.11***	11.85***	1284.64***	864.04***
L vs. VH	144.95***	42.41***	2155.40***	1566.08***
M vs. H	33.19***	8.88**	433.89***	550.71***
M vs. VH	108.34***	74.01***	965.13***	1102.23***
H vs. VH	23.68***	48.96***	152.56***	157.23***
Sexual Recidivism				
Overall[1]	71.86***	45.87***	1947.09***	801.96***
VL vs. L	1.09	1.16	23.54***	17.81***
VL vs. M	2.65	1.95	106.49***	72.05***
VL vs. H	18.39***	3.69	452.31***	329.04***
VL vs. VH	37.84***	11.14***	1092.61***	878.39***
L vs. M	0.91	0.50	52.32***	33.64***
L vs. H	22.24***	2.63	430.10***	324.42***
L vs. VH	52.26***	13.99***	1138.87***	845.31***
M vs. H	18.06***	3.05	187.43***	225.18***
M vs. VH	47.24***	28.92***	629.52***	655.21***
H vs. VH	8.38**	20.25***	111.43***	101.91***

* $p < .05$, ** $p < .01$, *** $p < .001$

L = Very Low; L = Low; M = Medium; H = High; VH = Very High; vs. = versus

[1] Log Rank (Mantel-Cox) Linear trend: Chi-Square (1). Vector of trend weights is -2, -1, 0, 1, 2.

Table 14. Pearson correlations and ROCs for original and final (override) risk levels for general, violent and sexual recidivism on the sex offender and nonsexual offender samples

Risk Level	General Recidivism		Violent Recidivism		Sexual Recidivism	
	Sex Offenders	**NonSex Offenders**	**Sex Offenders**	**NonSex Offenders**	**Sex Offenders**	**NonSex Offenders**
Correlation						
Original	.45***	.42***	.27***	.27***	.16***	.17***
Final	.26***	.37***	.18***	.23***	.11***	.15***
Area Under Curve						
Original	.75 ***	.74 ***	.73 ***	.72 ***	.73 ***	.76 ***
	(CI: .73-.77)	(CI: .74-.75)	(CI: .70-.76)	(CI: .71 - .73)	(CI: .68-.79)	(CI: .74-.77)
Final	.64 ***	.71 ***	.65 ***	.69 ***	.66 ***	.73***
	(CI: .61-.66)	(CI: .71-.72)	(CI: .62 - .69)	(CI: .68 - .70)	(CI: .59-.72)	(CI: .72-.75)

* p < .05, ** p < .01, *** p < .001

Table 15. Distribution of Sexual Offenders Placement by Initial and Final (after override)
Risk Level and Within Cell Recidivism Rate

		Final Risk Level					
		Very Low	**Low**	**Medium**	**High**	**Very High**	**Total**
Initial Risk Level	**Very Low**	79 12.7%	2 0%	48 12.5%	84 6.0%	11 18.2%	224 (11.8%) 10.3%
	Low	0 na	142 31.7%	99 24.2%	147 19.0%	17 5.9%	405 (21.3%) 24.2%
	Med.	1 100%	0 na	363 41.9%	193 40.4%	16 31.2%	573 (30.1%) 41.2%
	High	0 na	1 0.0%	10 50.0%	415 62.4%	21 61.9%	447 (23.5%) 62.0%
	Very High	0 na	0 na	17 70.6%	2 0.0%	237 84.4%	256 (13.4%) 82.8%
	Total	80 (4.2%) 13.8%	145 (7.6%) 31.0%	537 (28.2%) 37.1%	841 (44.1%) 44.0%	302 (15.9%) 73.2%	1905 (100.0%) 44.4%

Med. = Medium; na = not applicable.
Note. Cell percents represent within cell recidivism rates. Bracketed row and column percents represent percent of sexual offenders in the respective initial and final (override) risk level categories. Unbracketed row and column percents represent recidivism rates in the respective initial and final (override) risk level categories.

Table 16. Partial correlation matrix with LSI-OR section scores and override score controlling for total general risk/needs score (Section A) on the complete sample, sexual offenders, and nonsexual offenders

LSI-OR section	Sex Offenders (n=1904)	Nonsexual Offenders (n=24543)	Total (n=26448)
Total Section A[1]	-.57***	-.31***	-.31***
Ethnicity (Aboriginal)	.03	-.01	-.00
Age	.04	.08***	.10***
Gender (Female)	-.05*	-.08***	-.10***
Total Strengths	.02	-.03***	-.03***
Criminal History	-.11***	-.00	-.00
Education/Employment	-.00	-.07***	-.06***
Family/Marital	.01	.06***	.06***
Leisure/Recreation	-.01	.01	.01
Companions	-.01	-.06***	-.07***
Procriminal Attitudes	.11***	.09***	.10***
Substance Abuse	-.03	-.01	-.02***
Antisocial Patterns	.16***	.08***	.09***
Total Section B	.15***	.18***	.20***
Personal Problems	.14***	.17***	.19***
Perpetration History	.08***	.11***	.12***
Prison Experience	.05*	.05***	.06***
Social, Health, Mental Health	.10***	.03***	.04***
Special Responsivity	.12***	.13***	.15***

- $p < .05$, ** $p < .01$, *** $p < .001$

Note:
[1] Zero order correlation for the control variable (Total Section A) with outcome (Override score)

Table 17. Multiple Regression of LSI-OR sections on Risk Level Change Score (Final Risk Level minus Initial Risk Level) for sexual offenders

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero order	Partial	Part
Step 1										
(Constant)	1.454	.035		41.638	.000	1.385	1.522			
Total LSI-OR Score	-.055	.002	-.573	-30.517	.000	-.059	-.052	-.573	-.573	-.573
Step 2										
(Constant)	1.475	.132		11.167	.000	1.216	1.734			
Total LSI-OR Score	-.069	.003	-.718	-23.444	.000	-.075	-.063	-.573	-.474	-.434
Personal Problems with Criminogenic Potential Total (B1 of LSI)	.045	.013	.096	3.363	.001	.019	.071	-.288	.077	.062
History of Perpetration Total (B2 of LSI)	.030	.016	.047	1.849	.065	-.002	.062	-.314	.042	.034
Prison Experience: Institutional Factors Total (C1 of LSI)	-.002	.021	-.002	-.076	.939	-.043	.039	-.304	-.002	-.001
Gender (female)	-.171	.109	-.030	-1.572	.116	-.385	.042	-.092	-.036	-.029
Social Health and Mental Health Total (F1 of LSI)	.022	.009	.059	2.556	.011	.005	.040	-.237	.059	.047
Special Responsivity considerations (G1 of LSI)	.055	.019	.064	2.839	.005	.017	.093	-.177	.065	.053
Age At Data Extraction	.002	.001	.023	1.188	.235	-.001	.005	.162	.027	.022

Table 18. Multiple Regression of LSI-OR sections on Risk Level Change Score (Final Risk Level minus Initial Risk Level) for nonsexual offenders

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
Step 1										
(Constant)	.395	.006		69.957	.000	.384	.406			
Total LSI-OR Score	-.019	.000	-.306	-50.319	.000	-.020	-.018	-.306	-.306	-.306
Step 2										
(Constant)	.365	.016		22.700	.000	.334	.397			
Total LSI-OR Score	-.030	.001	-.480	-52.789	.000	-.031	-.029	-.306	-.319	-.313
Personal Problems with Criminogenic Potential Total (B1 of LSI)	.058	.003	.162	19.038	.000	.052	.064	-.065	.121	.113
History of Perpetration Total (B2 of LSI)	.031	.004	.059	7.994	.000	.023	.038	-.070	.051	.047
Prison Experience: Institutional Factors Total (C1 of LSI)	.000	.006	.000	.041	.968	-.011	.011	-.132	.000	.000
Gender (female)	-.074	.009	-.054	-8.646	.000	-.090	-.057	-.049	-.055	-.051
Social Health and Mental Health Total (F1 of LSI)	.000	.002	.001	.127	.899	-.003	.004	-.121	.001	.001
Special Responsivity considerations (G1 of LSI)	.051	.004	.088	12.417	.000	.043	.059	-.030	.079	.074
Age At Data Extraction	.003	.000	.055	8.922	.000	.002	.003	.095	.057	.053

Table 19. Multiple Regression of LSI-OR sections on general recidivism for sexual offenders

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
Step 1										
(Constant)	.058	.019		3.000	.003	.020	.096			
Total LSI-OR Score	.023	.001	.471	23.315	.000	.021	.025	.471	.471	.471
Step 2										
(Constant)	.361	.073		4.951	.000	.218	.504			
Total LSI-OR Score	.019	.002	.386	11.762	.000	.016	.022	.471	.261	.233
Personal Problems with Criminogenic Potential Total (B1 of LSI)	.002	.007	.007	.213	.831	-.013	.016	.316	.005	.004
History of Perpetration Total (B2 of LSI)	.032	.009	.095	3.497	.000	.014	.049	.339	.080	.069
Prison Experience: Institutional Factors Total (C1 of LSI)	.012	.012	.028	1.067	.286	-.010	.035	.298	.024	.021
Gender (female)	.019	.060	.007	.319	.750	-.099	.137	.032	.007	.006
Social Health and Mental Health Total (F1 of LSI)	-.006	.005	-.031	-1.231	.219	-.015	.004	.228	-.028	-.024
Special Responsivity considerations (G1 of LSI)	-.019	.011	-.043	-1.770	.077	-.040	.002	.179	-.041	-.035
Age At Data Extraction	-.007	.001	-.170	-8.167	.000	-.008	-.005	-.262	-.184	-.162

Table 20. Multiple Regression of LSI-OR sections on general recidivism for nonsexual offenders

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
Step 1										
(Constant)	.049	.005		10.378	.000	.040	.058			
Total LSI-OR Score	.024	.000	.435	75.575	.000	.023	.025	.435	.435	.435
Step 2										
(Constant)	.261	.014		19.200	.000	.234	.288			
Total LSI-OR Score	.021	.000	.383	43.917	.000	.020	.022	.435	.270	.250
Personal Problems with Criminogenic Potential Total (B1 of LSI)	.019	.003	.059	7.230	.000	.014	.024	.307	.046	.041
History of Perpetration Total (B2 of LSI)	.004	.003	.009	1.231	.218	-.002	.010	.231	.008	.007
Prison Experience: Institutional Factors Total (C1 of LSI)	.032	.005	.047	6.654	.000	.023	.041	.279	.042	.038
Gender (female)	-.033	.007	-.027	-4.546	.000	-.047	-.019	-.073	-.029	-.026
Social Health and Mental Health Total (F1 of LSI)	-.006	.002	-.026	-3.729	.000	-.009	-.003	.177	-.024	-.021
Special Responsivity considerations (G1 of LSI)	-.016	.003	-.031	-4.527	.000	-.022	-.009	.185	-.029	-.026
Age At Data Extraction	-.004	.000	-.102	-17.314	.000	-.005	-.004	-.137	-.110	-.099

Figure 1. Survival curves for sexual offenders' general recidivism by initial risk level
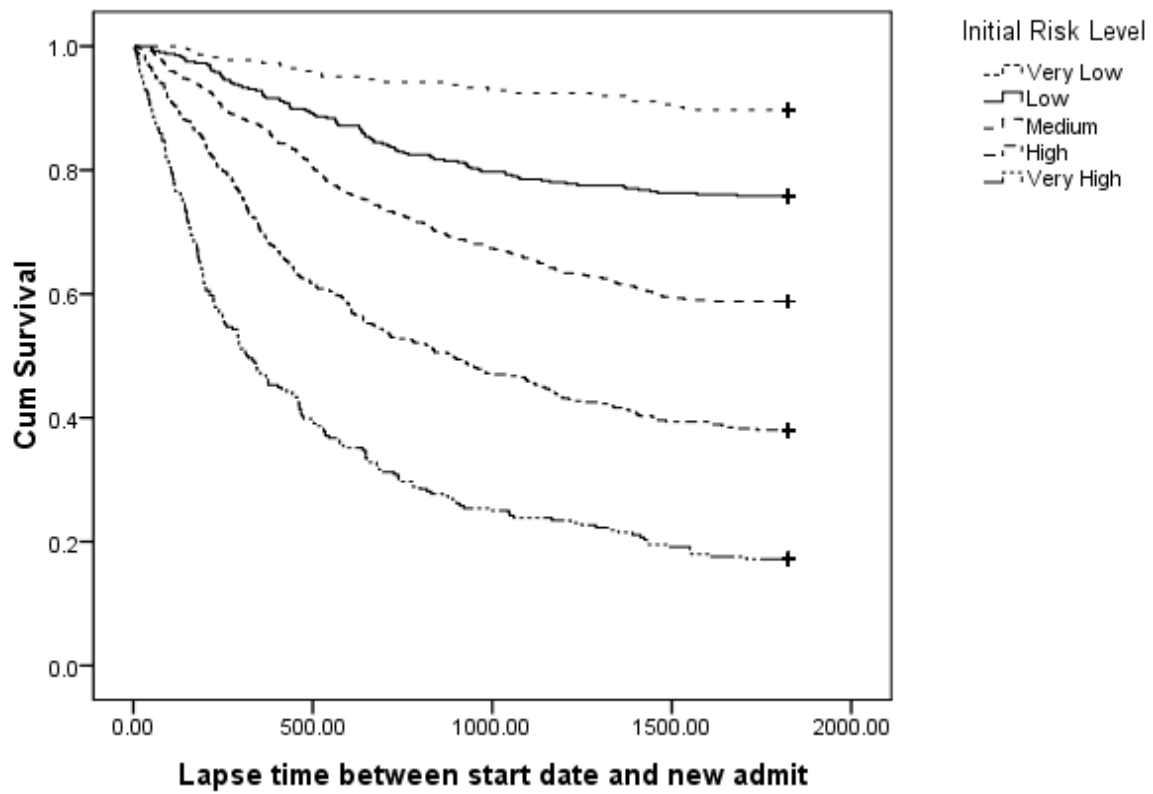
Figure 2. Survival curves for sexual offenders' general recidivism by final risk level
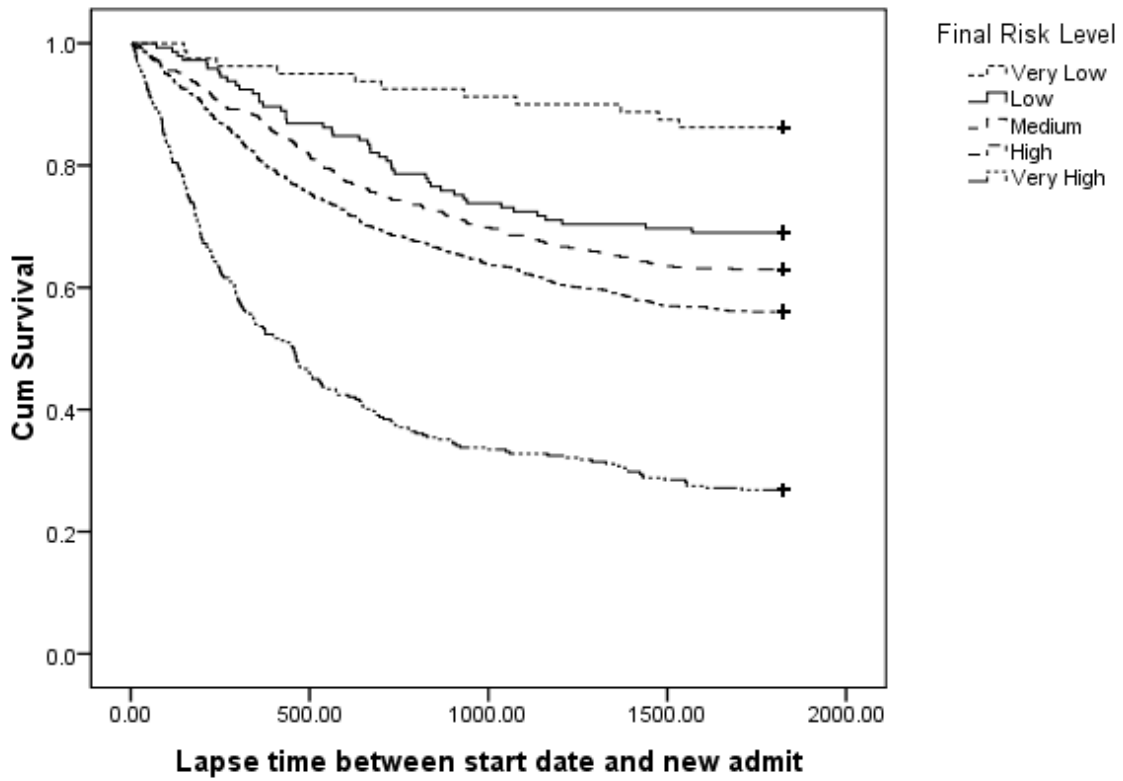
Figure 3. Survival curves for nonsexual offenders' general recidivism by initial risk level

Figure 4. Survival curves for nonsexual offenders' general recidivism by final risk level

Figure 5. Survival curves for sexual offenders' violent recidivism by initial risk level

Figure 6. Survival curves for sexual offenders' violent recidivism by final risk level

Figure 7. Survival curves for nonsexual offenders' violent recidivism by initial risk level

Figure 8. Survival curves for nonsexual offenders' violent recidivism by final risk level

Figure 9. Survival curves for sexual offenders' sexual recidivism by initial risk level
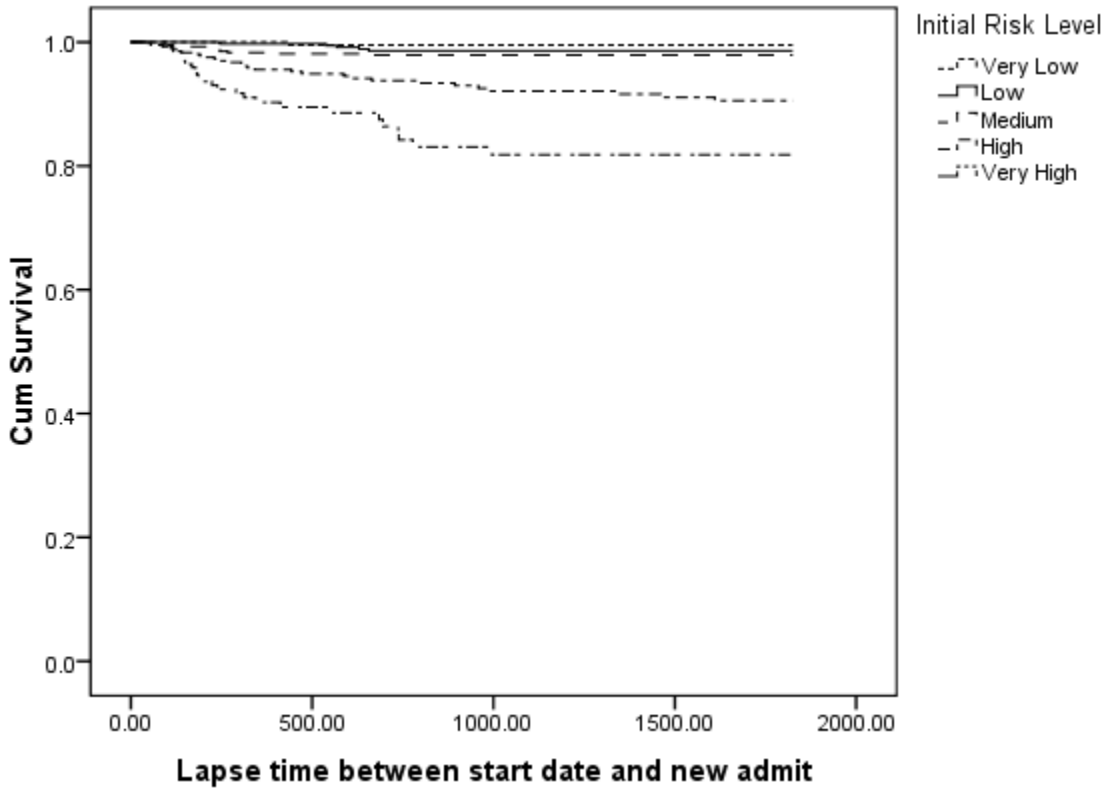
Figure 10. Survival curves for sexual offenders' sexual recidivism by final risk level
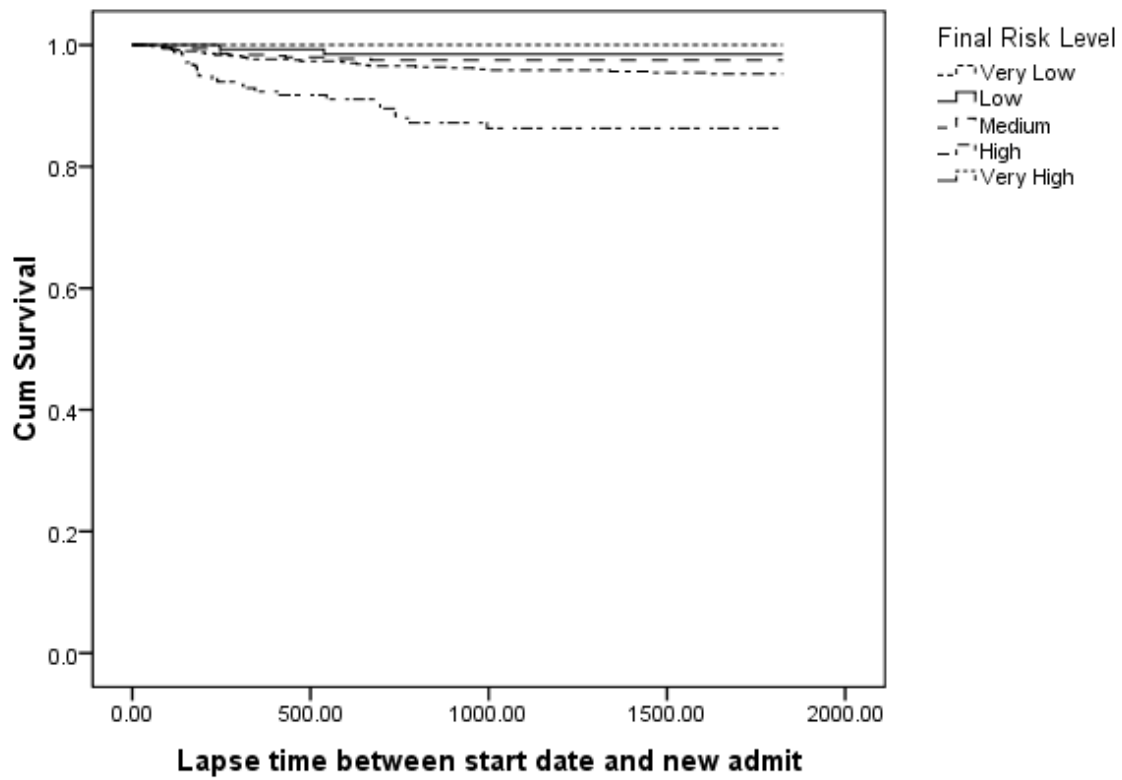
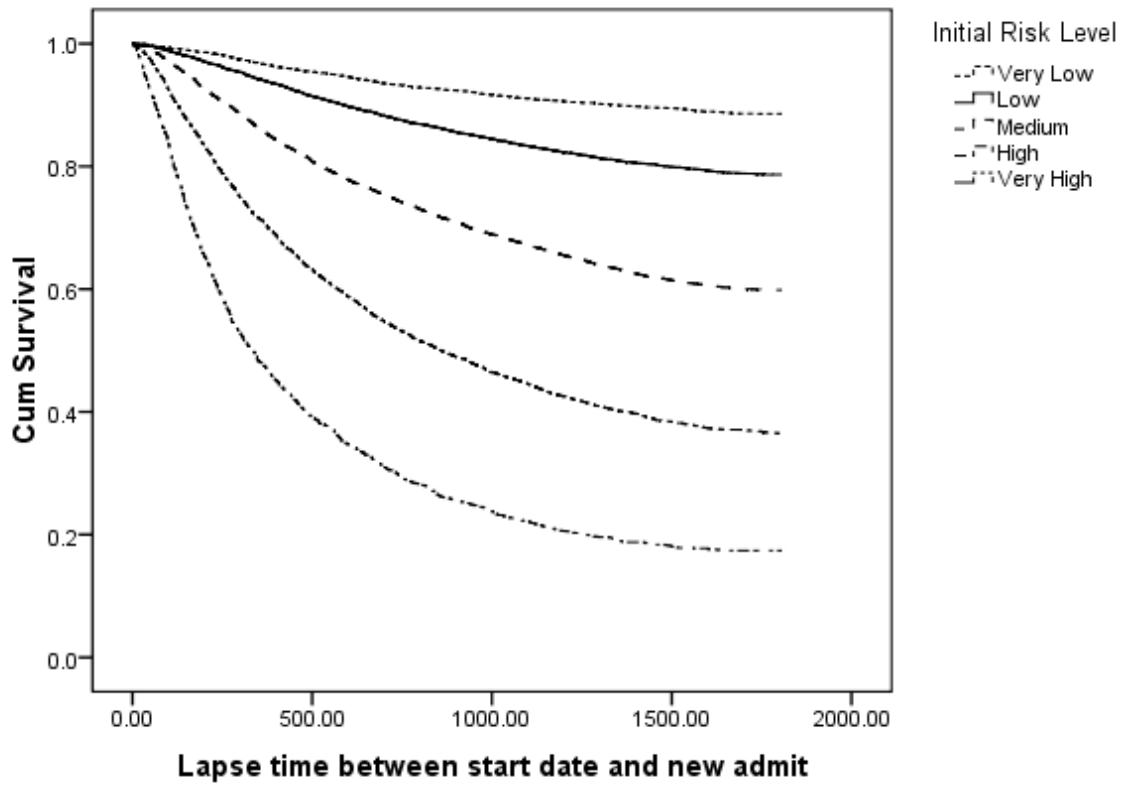Figure 11. Survival curves for nonsexual offenders' sexual recidivism by initial risk level

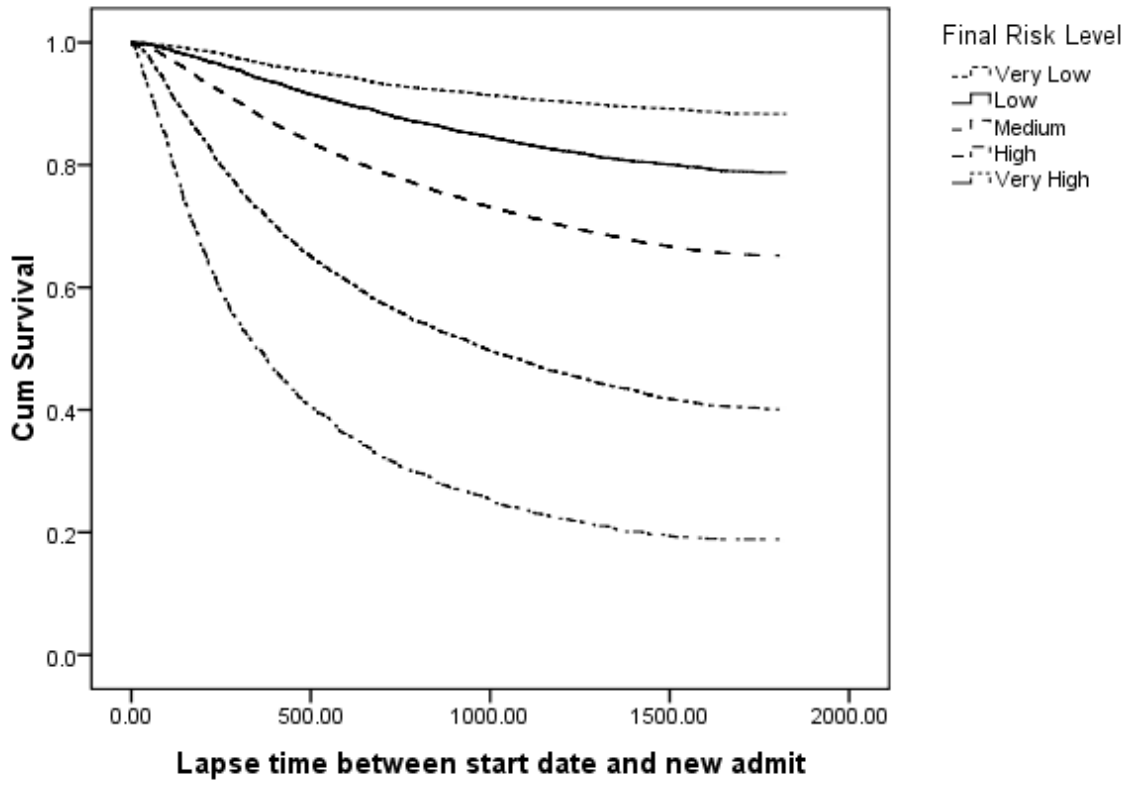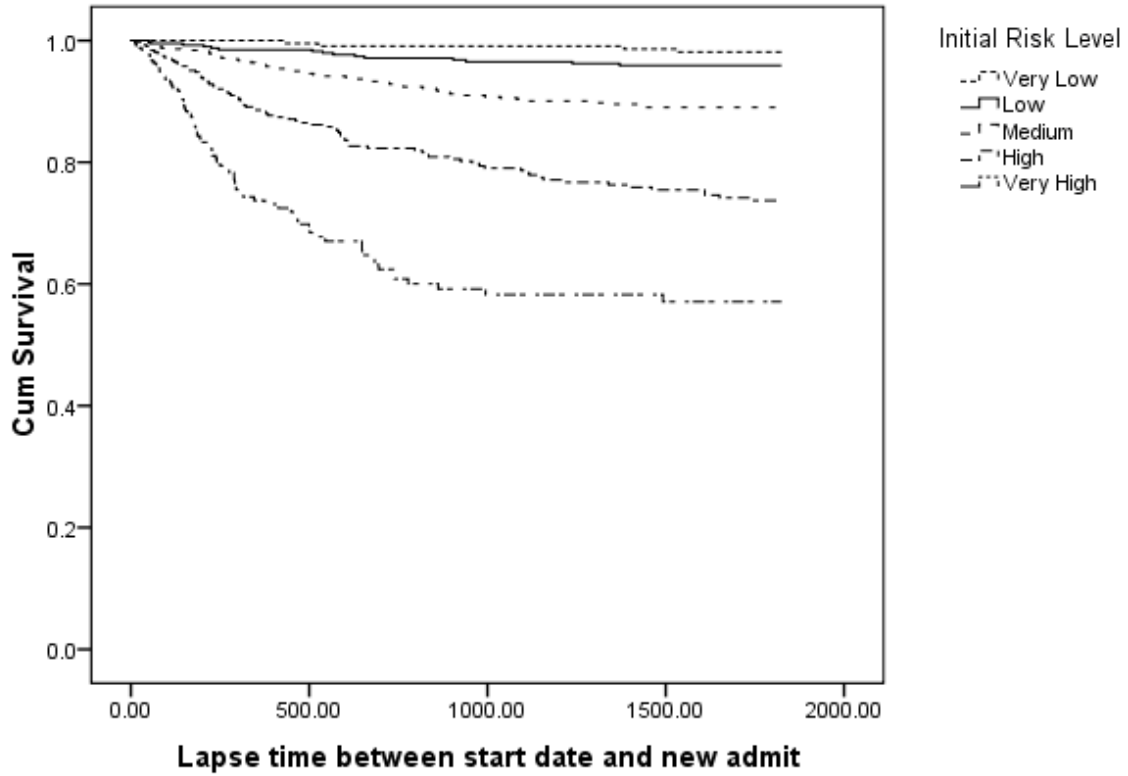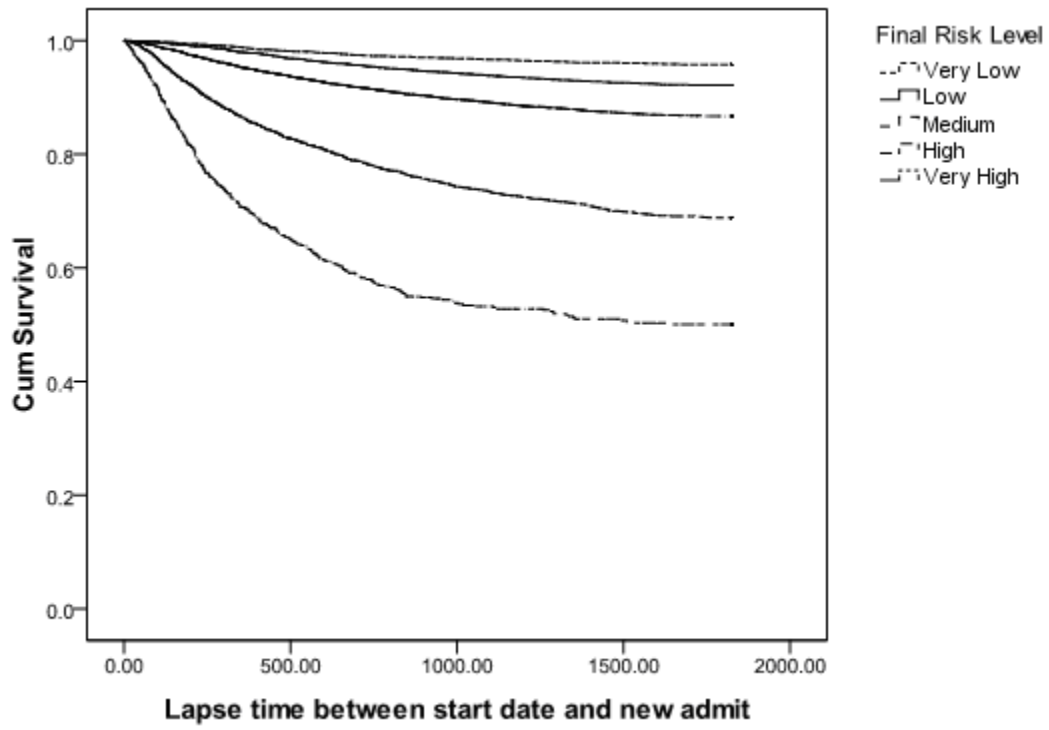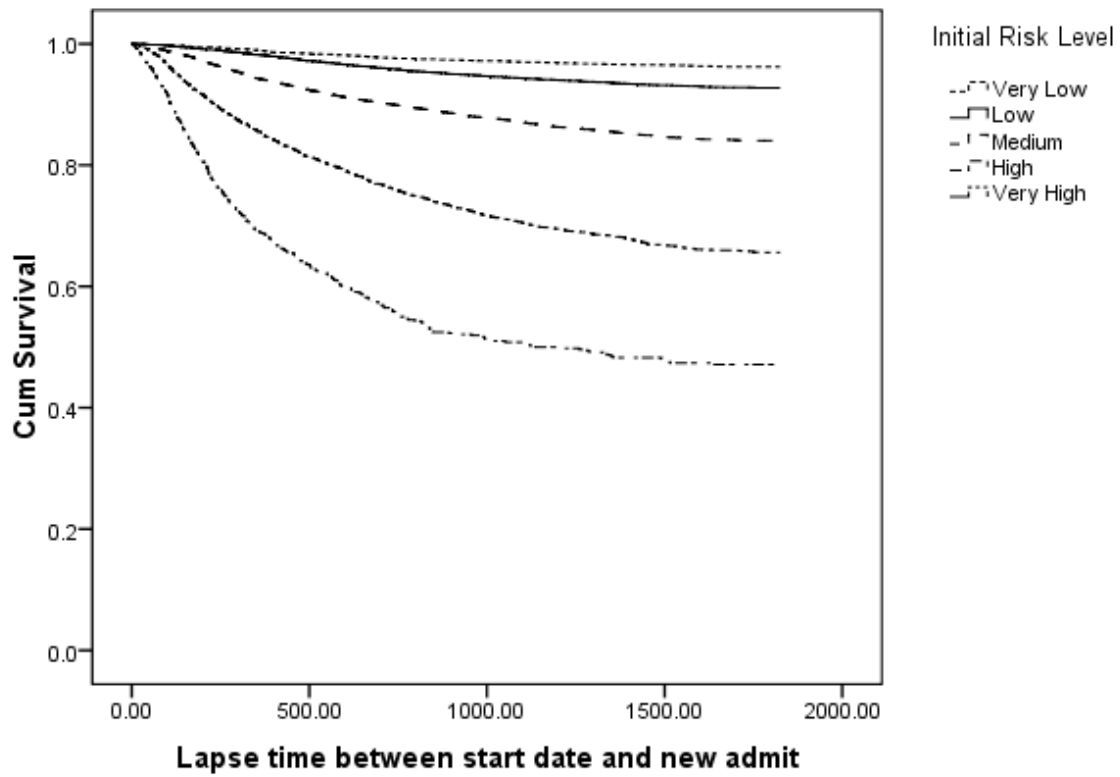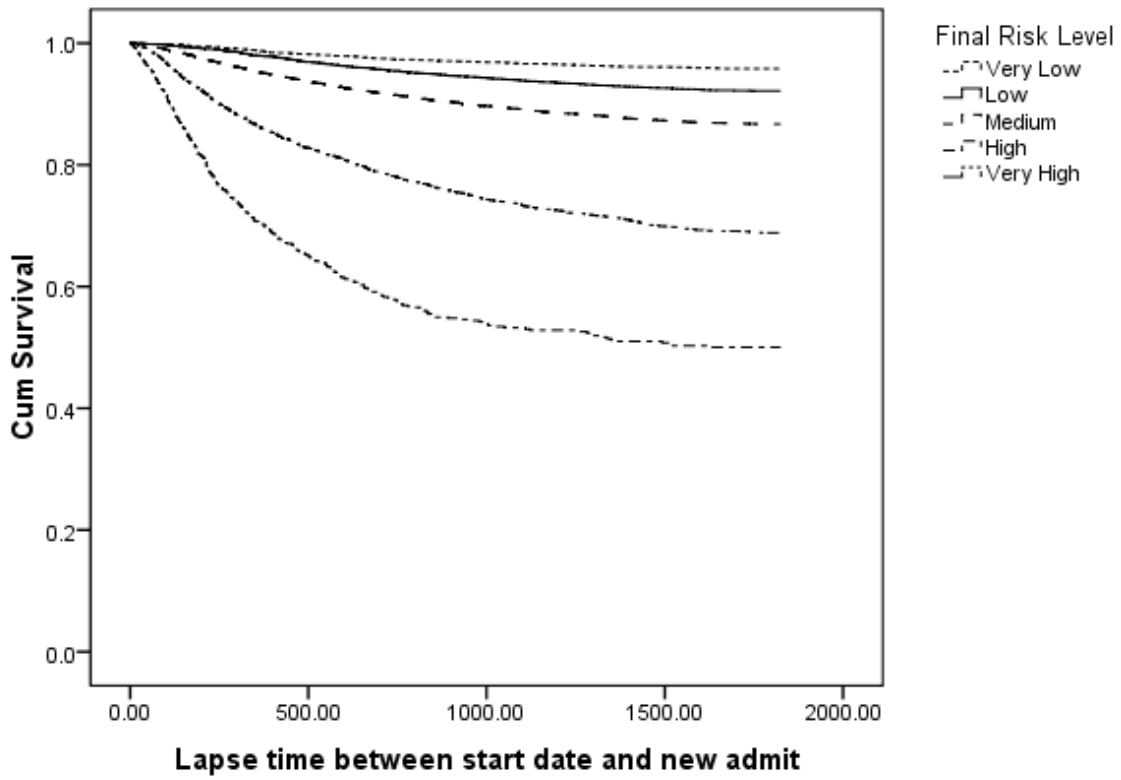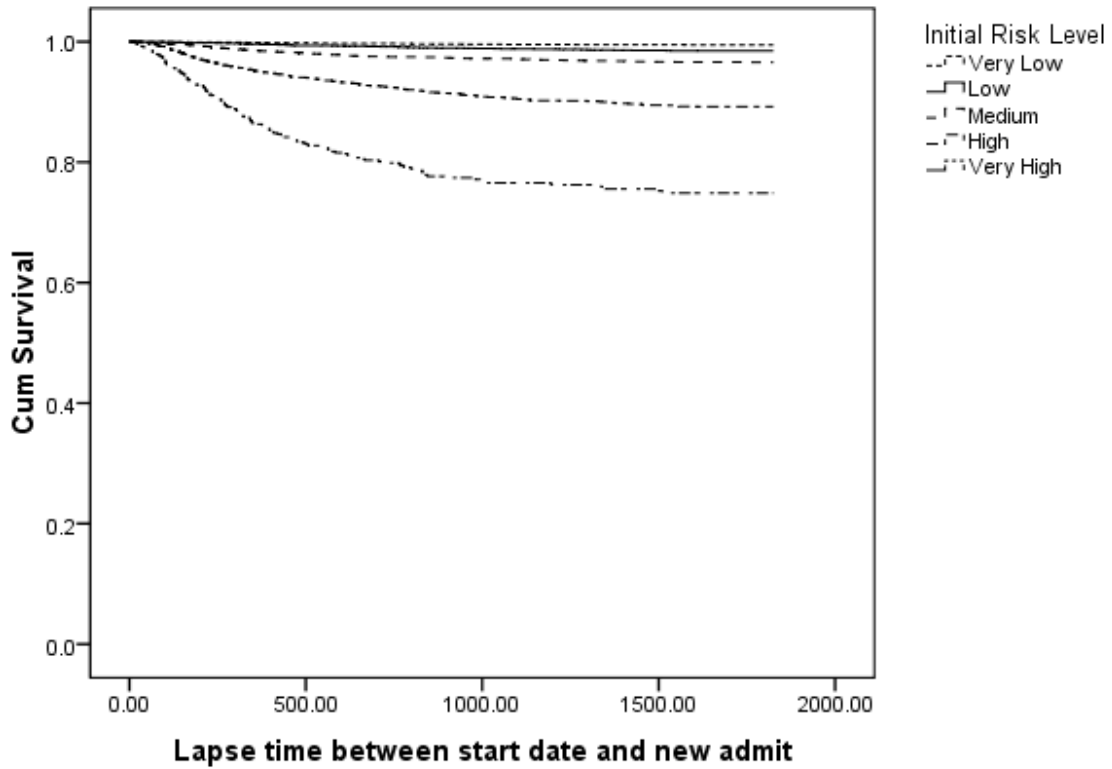Figure 12. Survival curves for nonsexual offenders' sexual recidivism by final risk level
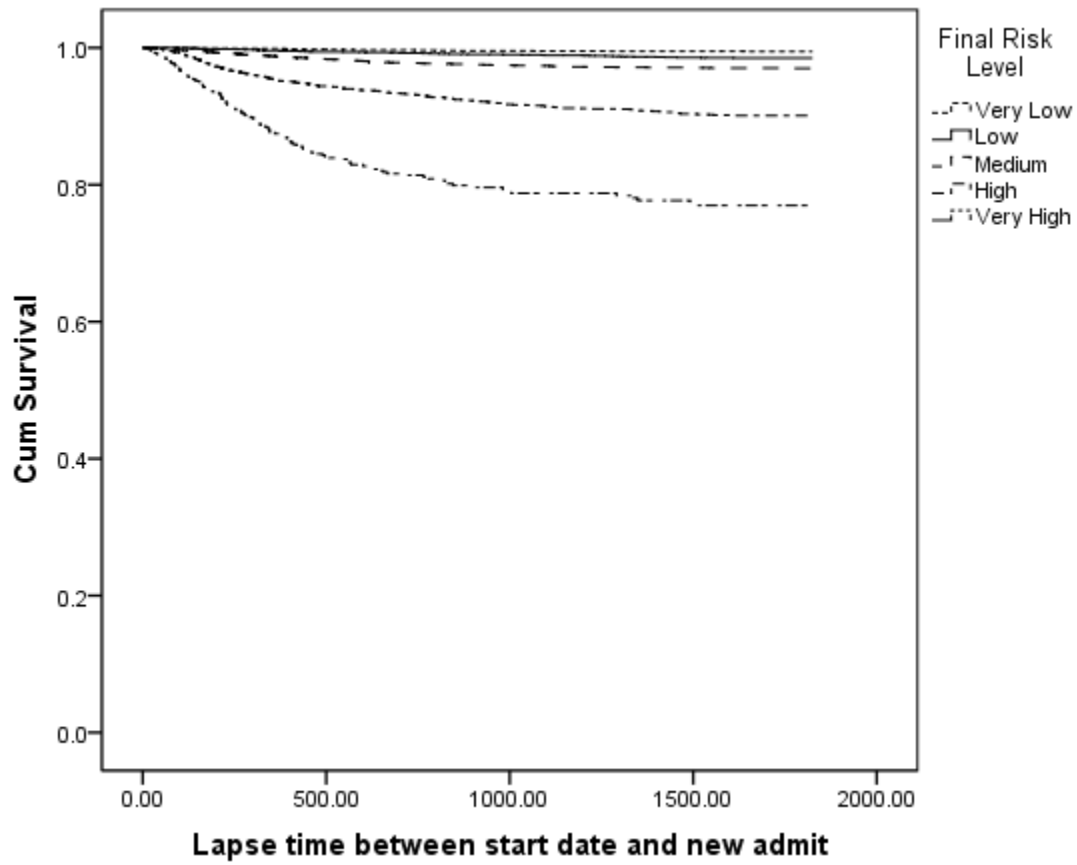
Appendix A

Modified Ontario Offense Severity Scale

Offence Severity	Offence Type
0	Nonrecidivist
1	Municipal Bylaw Offences
2	Other Provincial Offences
3	Liquor Licence Act Offences
4	Highway Traffic Act Offences
5	Parole Violations
6	Other Federal Statute Offences
7	Misc. Offences against Public Order
8	Drinking & Driving Offences
9	Breach of Court Order / Escape
10	Criminal Code Traffic Offences
11	Drug Possession Offences
12	Obstruction of Justice Offences
13	Morals & Gaming Offences
14	Arson/Property Damage Offences
15	Assault & Related Offences
16	Theft/Possession Offences
17	Misc. Offences against the Person
18	Fraud & Related Offences
19	Weapons Offences
20	Traffic/Import Drug Offences
21	Non-Violent Sexual Offences
22	Break & Enter & Related Offences
23	Violent Sexual Offences
24	Serious violent Offences
25	Homicide & Related Offences

N.B. Unknown offenses were coded as missing data

Appendix B
LSI-OR General Risk/Need Item Correlations with General, Violent and Sexual Recidivism and Override Score

	General Recidivism		Violent Recidivism		Sexual Recidivism		Override Score[1]	
	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders
Item 1	.31***	.29***	.17***	.17***	.09***	.10***	-.17***	-.02**
Item 2	.38***	.32***	.22***	.21***	.10***	.12***	-.12***	-.02***
Item 3	.41***	.32***	.24***	.22***	.12***	.13***	-.09***	-.01
Item 4	.24***	.26***	.16***	.20***	.10***	.14***	-.00	.02**
Item 5	.28***	.23***	.21***	.17***	.15***	.13***	.04	-.01
Item 6	.31***	.32***	.19***	.22***	.11***	.14***	-.14***	-.00
Item 7	.36***	.27***	.23***	.22***	.13***	.17***	.09***	.03***
Item 8	.45***	.35***	.25***	.24***	.13***	.16***	-.02	.01
Item 9	.24***	.21***	.18***	.16***	.10***	.09***	-.02	-.04***
Item 10	.29***	.24***	.22***	.18***	.11***	.11***	.03	-.01
Item 11	.19***	.16***	.11***	.11***	.07**	.08***	.04	-.02***
Item 12	.08**	.11***	.04	.06***	.03	.05***	.04	.00
Item 13	.16***	.18***	.09***	.11***	.07**	.07***	-.01	-.05***
Item 14	.25***	.19***	.18***	.12***	.12***	.10***	-.02	-.05***
Item 15	.25***	.23***	.18***	.18***	.10***	.10***	-.03	-.04***
Item 16	.25***	.23***	.17***	.18***	.11***	.10***	-.03	-.04***
Item 17	.26***	.23***	.17***	.18***	.10***	.10***	-.02	-.05***
Item 18	.07**	.03***	-.03	-.02*	.00	-.01	-.03	.13***
Item 19	.14***	.12***	.09***	.08***	.05*	.05***	.02	.01
Item 20	.09***	.10***	.07***	.07***	.04*	.05***	.01	.02**
Item 21	.22***	.16***	.13***	.11***	.10***	.06***	.01	-.04***

	General Recidivism		Violent Recidivism		Sexual Recidivism		Override Score[1]	
	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders
Item 22	.19***	.14***	.11***	.10***	.08***	.06***	.03	.00
Item 23	.29***	.25***	.14***	.17***	.09***	.11***	-.04*	.01
Item 24	.32***	.26***	.19***	.18***	.10***	.10***	-.10***	-.08***
Item 25	.36***	.29***	.24***	.21***	.15***	.12***	-.02	-.04***
Item 26	.11***	.11***	.06*	.09***	.04	.08***	.07**	.01
Item 27	.19***	.14***	.14***	.11***	.10***	.08***	.08***	.01
Item 28	.30***	.22***	.18***	.17***	.12***	.11***	.05*	.06***
Item 29	.27***	.23***	.16***	.16***	.11***	.11***	.08***	.04
Item 30	.04	.06***	-.01	.02***	.02	.02***	.06**	.06***
Item 31	.17***	.15***	.08***	.07***	.06*	.06***	.07***	.04***
Item 32	.21***	.17***	.05*	.05***	.04	.06***	-.08***	-.01*
Item 33	.28***	.26***	.17***	.19***	.09***	.11***	-.06**	-.03***
Item 34	.22***	.14***	.05*	.000	.07**	.04***	-.04	.00
Item 35	.26***	.25***	.24***	.22***	.11***	.13***	.03	-.00
Item 36	.29***	.21***	.16***	.11***	.09***	.08***	-.05*	-.02*
Item 37	.26***	.21***	.11***	.10***	.04	.08***	.01	.03***
Item 38	.25***	.22***	.16***	.16***	.06**	.12***	.05*	.00
Item 39	.15***	.12***	.05*	.08***	.02	.03***	.05*	.01
Item 40	.06**	.06***	.02	.03***	.02	.03***	.097	.04***
Item 41	.28***	.24***	.20***	.18***	.15***	.14***	.05*	.00
Item 42	.28***	.24***	.15***	.16***	.10***	.10***	.06*	.07***
Item 43	.30***	.25***	.19***	.18***	.13***	.13***	.10***	.03***
Mean Item Correlation	**0.24**	**0.21**	**0.14**	**0.14**	**0.09**	**0.09**	**0.00**	**0.00**

[1] partial correlation, controlling for total risk/need score

LSI-OR Specific Risk/Need Item Correlations with General, Violent and Sexual Recidivism and Override Score

	General Recidivism		Violent Recidivism		Sexual Recidivism		Override Score[1]	
	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders
Item B1.1	.35***	.29***	.20***	.20***	.10***	.14***	.02	.03***
Item B1.2	-0.02	0.01	-0.01	.02**	-0.01	0	.02	.00
Item B1.3	0.02	0.01	-0.03	0	-0.03	0	.05*	.02***
Item B1.4	.08***	.06***	.05*	.04***	0.04	.02**	.07**	.02***
Item B1.5	.23***	.18***	.12***	.13***	.06**	.08***	.00	.07***
Item B1.6	.27***	.11***	.08***	-0.01	.08***	.03***	-.04	.17***
Item B1.7	.14***	.05***	0	-.02**	0.02	.02*	.04	.14***
Item B1.8	-.19***	.03***	-.12***	.02*	-.06*	0.01	.19***	.04***
Item B1.9	.16***	.11***	.06*	.08***	0.02	.06***	.13***	.04***
Item B1.10	0.01	.04***	-0.03	.03***	-0.01	.03***	.07**	-.00
Item B1.11	.09***	.04***	-0.02	0.01	-0.01	0.01	.09***	.03***
Item B1.12	.21***	.20***	.12***	.15***	.07**	.10***	-.00	-.01
Item B1.13	.21***	.20***	.14***	.14***	.09***	.07***	.00	.03***
Item B1.14	.06**	.06***	0.04	.05***	0.02	.02***	.05*	.03***
Item B2.1	0.03	.02***	0.04	.014*	0.03	.01*	.10***	.01
Item B2.2	-.12***	0	-.07**	-0.01	-0.03	0	.06*	.03***
Item B2.3	.32***	.18***	.18***	.10***	.09***	.07***	.01	.02***
Item B2.4	.20***	.03***	0	-.06***	.04*	-0.01	-.02	.16***
Item B2.5	.27***	.15***	.13***	.08***	.10***	.06***	.06**	.02***
Item B2.6	.25***	.16***	.13***	.09***	.11***	.07***	.03	.06***
Item B2.7	.06*	.05***	.06*	.03***	0.04	.03***	.03	.01
Item B2.8	.24***	.19***	.19***	.18***	.13***	.12***	.02	.02***
Item B2.9	.11***	.07***	0.01	-.01*	0.01	0	-.04	-.02***

Mean Item Correlation	0.13	0.10	0.06	0.05	0.04	0.04	0.04	0.04

[1] partial correlation, controlling for total risk/need score

LSI-OR Prison Experience Item Correlations with
General, Violent and Sexual Recidivism and Override Score

	General Recidivism		Violent Recidivism		Sexual Recidivism		Override Score[1]	
	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders
Item C.1	.14***	.13***	.10***	.10***	.05*	.09***	.06**	.02**
Item C.2	.28***	.23***	.22***	.18***	.13***	.11***	.02	.02***
Item C.3	0.03	.04***	-0.01	.02**	.02	.00	-.07**	-.01
Item C.4	.10***	.13***	0.04	.10***	0.01	.10***	-.03	.02**
Item C.5	.07**	.07***	0.02	.04***	0	.05***	.03	.03***
Item C.6	.19***	.14***	.13***	.10***	.08***	.10***	.06*	.02**
Item C.7	.08***	.07***	.05*	.05***	.05*	.04***	.04	.02**
Item C.8	.16***	.15***	.17***	.12***	.12***	.09***	.07**	.03***
Item C.9	.12***	.10***	.11***	.11***	0.03	.08***	.01	.01
Mean Item Correlation	**0.13**	**0.12**	**0.09**	**0.09**	**0.05**	**0.07**	**0.02**	**0.02**

[1] partial correlation, controlling for total risk/need score

LSI-OR Social, Health and Mental Health Item Correlations with
General, Violent and Sexual Recidivism and Override Score

	General Recidivism		Violent Recidivism		Sexual Recidivism		Override Score[1]	
	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders
Item F1.1	.18***	.15***	.13***	.14***	.08***	.07***	-.00	.01
Item F1.2	.12***	.12***	.09***	.10***	.07**	.05***	.04	.02*
Item F1.3	.19***	.14***	.13***	.11***	.10***	.06***	.04	.03***
Item F1.4	-0.03	.02***	-0.03	.04***	-0.03	-0.01	.03	-.00
Item F1.5	0.02	.01*	-0.01	0.01	-0.03	0	.04	.01*
Item F1.6	0.01	0	-0.02	0.01	-0.02	-0.01	-.03	-.01
Item F1.7	.12***	.10***	0.03	.08***	0.03	.05***	.08***	.02**
Item F1.8	0	.018**	-.05*	0.01	-0.04	0.01	.06**	.00
Item F1.9	0.01	.02**	-0.03	0	-0.01	0.01	.06*	.03***
Item F1.10	.12***	.08***	0.04	.04***	.06*	.02***	.06*	.02***
Item F1.11	.07**	.09***	.07**	.05***	.06**	.03***	.02	-.00
Item F1.12	-0.02	.03***	-0.01	.02**	-0.04	0.01	.02	.02***
Item F1.13	0	-.02***	0.01	0	0.01	-.02*	.00	.04***
Item F1.14	.19***	.10***	.08***	.06***	.09***	.03***	.03	.00
Item F1.15	.17***	.09***	.07**	.05***	.07**	.02***	.04	.00
Item F1.16	.05*	.07***	0.03	.06***	0.03	.02***	.05*	-.00
Item F1.17	.16***	.08***	.11***	.06***	.09***	.03***	.07**	.00
Item F1.18	.18***	.10***	.09***	.06***	.10***	.05***	.05*	.00
Item F1.19	.07***	.04***	.07***	.02***	0.01	0.01	.00	.02**
Item F2.1	.22***	.22***	.16***	.17***	.09***	.13***	.00	.03***
Mean Item Correlation	**0.09**	**0.07**	**0.05**	**0.05**	**0.04**	**0.03**	**0.03**	**0.01**

[1] partial correlation, controlling for total risk/need score

LSI-OR Special Responsivity Considerations Item Correlations
with General, Violent and Sexual Recidivism and Override Score

	General Recidivism		Violent Recidivism		Sexual Recidivism		Override Score[1]	
	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders	Sex Offenders	Nonsexual Offenders
Item G1.1	.21***	.22***	.14***	.14***	.12***	.09***	.06*	.06***
Item G1.2	.08***	.12***	0.01	.06***	.06**	.04***	.06**	.12***
Item G1.3	.08***	.05***	0.01	.02***	0.02	.02**	.11**	.02***
Item G1.4	.09***	.03***	0.03	-0.01	.08***	0.01	.07**	.07***
Item G1.5	-0.01	.00	0.02	.00	0.03	-0.01	-.04	.03***
Item G1.6	.06*	.05***	0.01	.03***	0.01	.03***	.02	.01
Item G1.7	-0.02	-.02***	-0.02	-.02*	0.04	-0.01	.00	.03***
Item G1.8	0.03	.04***	0.02	.04***	0.03	.03***	.07**	.03***
Mean Item Correlation	**0.06**	**0.06**	**0.03**	**0.03**	**0.05**	**0.02**	**0.03**	**0.01**

[1] partial correlation, controlling for total risk/need score