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Study within a Sample of Male Young Offenders

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**The Level of Service Inventory-Ontario Revision: A Recidivism
Follow-up Study within a Sample of Male Young Offenders**

Margaret Nowicka-Sroga, M.A.

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The Level of Service Inventory-Ontario Revision: A Recidivism Follow-up Study
within a Sample of Male Young Offenders

Abstract

This study represents the first attempt to evaluate the predictive validity of the Level of Service Inventory-Ontario Revision (LSI-OR; Andrews, Bonta, & Wormith, 1995) on young offenders. The LSI-OR is a risk/need assessment measure designed to assess risk of recidivism and other offender problems, and to classify offenders for supervision and treatment (Andrews & Bonta, 1998). Although the scale has been used with young offenders, it has not yet been adequately validated with this population.

The sample consisted of 154 16- to 18-year old, Caucasian, male, young offenders from Northern Ontario, who had been sentenced to custody or community (probation) terms. Following a 3.8-year follow-up period, 50.6% of the sample had been reconvicted, with 20.1% for a violent offence. Recidivists scored significantly higher than nonrecidivists on the LSI-OR total score and on six of the eight risk and need subscales. Correlations between the LSI-OR total score and general and violent recidivism were .46 and .31, respectively. ROC analyses indicated significant effects for LSI-OR total and combined scales with general offending (*AUCs* of .77 to .80) and with violent offending (*AUCs* of .72 to .74). Controlling for location (custody-community), hierarchical multiple regression analyses revealed the LSI-OR's incremental predictive validity for general, violent, and nonviolent recidivism. The General Risk/Need and Responsivity Sections made unique contributions to the final model of binary nonviolent recidivism. General Risk/Need contributed to the prediction of binary violent recidivism. Among the General Risk/Need subsections, Criminal history and Leisure/recreation as well as Criminal history and Education/employment uniquely

contributed to the model of nonviolent and violent charges, respectively. The results support the use of the LSI-OR instrument with 'older' young offenders, especially those in the community, but should be cross validated on another (larger) sample of 16- to 18-year old offenders. Future research exploring the role of young offenders' responsivity concerns, in particular their motivational problems and use of denial/minimization, is suggested because these items also discriminated between recidivists and nonrecidivists in the current study.

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The Level of Service Inventory-Ontario Revision: A Recidivism Follow-up Study within a Sample of Male Young Offenders

Introduction and Research Questions

There are several risk/need instruments currently used to assess needs and to classify the risk of continued involvement in delinquent behaviour of juvenile offenders in Ontario, Canada. They will be discussed later in this proposal. The current research underscores the two primary rationales for the use of structured assessment and classification procedures – more consistent decisions and more effective resource allocation (Wiebush, Baird, Krisberg, & Onek, 1995). These rationales underlie all formal classification systems, at various points in system processing. Such processing is composed of many stages leading to a full adjudication and commitment of a young offender to the youth authority. Only a minority of youth passes through all of these stages (Grisso, 1998). Intake probation officers typically have considerable discretion concerning how to handle referrals, and play a significant role in the case management decisions for a young offender (Grisso, 1998; Jung, Rawana, & Lod, 1997). Decisions of this caliber cannot be based on informal, discretionary procedures carried out by individuals who have varying philosophies and different levels of experience and knowledge, and who use dissimilar criteria in the assessment process. It appears that a structured decision-making, including the use of standardized risk and need assessment instruments and structured classification systems with juvenile offenders, has now become the norm.

It is imperative to evaluate how such systems are currently being used (or could be used) to enhance the response to juvenile offenders. For example, at intake, the probation officers collect information (past records, interviews with the youth and parents) and make classification

decisions that may range from an “informal adjustment“, preferable in some cases of first-time offenders, when the alleged offense is of low to moderate seriousness. Alternatively, they may proceed to detention, prosecution, disposition and placement decisions. Placement decisions range from the placement on court probation, through commitment to the juvenile system’s open and secure custody. Whether it is a probation placement or a custody disposition, a development of a rehabilitation plan for a young offender is essential and differential intervention is encouraged (Andrews & Bonta, 1994; 1998; Wiebush, Baird, Krisberg, & Onek, 1995). The juvenile justice system needs effective tools that have the capacity to link directly the nature of the intervention with the offender’s need for control, supervision and services. In particular, youths in secure custody, ‘transitioned’ through a series of gradually less restrictive rehabilitation plans that aim at eventual re-entry into the community, require that their risk and needs be re-assessed using a reliable and valid structured procedure, sensitive to change over time. For that to happen, a complete assessment of criminogenic and other dynamic needs, along with the risk or placement/custody assessment, is of the essence.

The Level of Service Inventory-Ontario Revision (LSI-OR) (Andrews, Bonta & Wormith, 1995) is a broadband risk/need instrument used with the Phase II young offenders since 1996. It has been shown to be useful for the assessment of both risk and critical (criminogenic and noncriminogenic) problem areas in adults, resulting in reliable and valid classification/treatment decisions for (adult) males, females and both Native and non-Native offenders (Andrews & Bonta, 1998; Girard, 1999; Rettinger, 1998). Although it has been used with young offenders, it has not been validated on that population as of yet. There are concerns regarding implementation of instruments without evaluating their validity on the specific population (Jung & Rawana, 1999; Wormith & Goldstone, 1984). Previous research has

emphasized the importance of evaluating and re-evaluating the validity of any risk-screening instrument (Jung & Rawana, 1999; Wormith & Goldstone, 1984). It places the institution in a position of accountability for the manner in which it uses its resources to process its clients.

For this very reason, the presented research is primarily interested in evaluating the validity of the LSI-OR risk and need instrument, as it is used with adjudicated youth in Ontario, Canada. The LSI-OR instrument is scrutinized in terms of its performance on a sample of 154 (Phase II) male young offenders, relative to how it predicts later recidivism. As in any other risk assessment procedure, assessment with the LSI-OR involves case classification because the person about whom the judgment is being made “is equated with others in a more or less clearly conceived group who are categorized as relatively safe or dangerous individuals” (Wiebush, Baird, Krisberg, & Onek, 1995, p.173).

The first question that this research undertakes to answer is whether the LSI-OR instrument is capable of successfully classifying young offenders into the very low, low, medium, high and very high risk of re-offending categories, as it proposes to do. It assesses how these very low to very high risk/need categories of young offenders, as per the LSI-OR assessment, do, in fact, differ on their actual recidivism rates, after their release into the community. The investigation of the relationship between the LSI-OR levels of risk and actual recidivism rates is an important focus of this study, resulting in an analysis (and ultimately confirmation or disconfirmation) of its predictive validity.

An attempt is made to answer the following related questions, important in terms of the LSI-OR instrument’s predictive validity with juvenile offenders. Firstly, whether those who recidivate and those who do not, differ on various important LSI-OR variables (risk/need factors), beyond and above their differences on the General risk/need (Section A, a source of the

LSI-OR total score), including the Specific criminogenic needs (Section B), Strengths, Mental-health problems (Section F) and Treatment Responsivity considerations (Section G). These analyses include comparisons between institutional and community groups.

Secondly, a question is asked whether the LSI-OR is equally accurate in predicting general and violent crimes, in consideration of the lower base rates of violent crimes (Rice & Harris, 1995) and considering that the LSI-OR (Andrews, Bonta, & Wormith, 1995) has not yet been extensively researched with respect to violence (Douglas & Webster, 1999).

Trends in Youth Crime

Since the early 1990s in Canada, crimes committed by youth, violent crimes in particular, have received increased public attention (Sinclair & Dell, 2000). Those who have conducted studies on public perceptions of youth crime suggest a public perception that youth crime is rising (John Howard Society of Alberta, 1997). However, such perception does not appear to be supported by the current research. Peter Carrington (1999, p.3) compared the Uniform Crime Reporting (UCR) data for 1986-1992 with 1980-1983 and found “a statistically non-significant increase of 5 percent in the per capita rate of young persons apprehended, and an increase of 29 percent in the rate of young persons charged.” He and other researchers (Doob, 1992; 1999; Doob & Sprott, 1996) concluded that youth violence had not increased during those years and attributed evidence to an increasing tendency to lay charges against youth under the Young Offenders Act (YOA) and under “zero tolerance” policies.

Although there is a possibility that the so-called “dark figure” of youth crime (Gabor, 1999, p. 385) could be somewhat larger than one reported in the official justice statistics, there is no doubt, that the sudden increase in the charge rate immediately after the YOA came into effect was unrelated to the rate of young persons apprehended (Carrington, 1999). Carrington attributes

this trend to a sudden drop in police diversion of young offenders and the jump in police charging. Similar conclusions were drawn from a census of the Criminal Code and other federal statute charges heard in Canadian courts, from 1986-87 to 1989-90, which led to the conclusion that the profile of the young offender in Canada had changed little during that period (Hendrick & Lechance, 1998). The majority of young offenders were found guilty of property offences and about the same proportion of first-time offenders and repeat offenders were convicted of violent and property offences.

The research data for 1992 to 1997 period indicate that the rate of youths charged by the police for an offence decreased except for the YOA and violent crimes, which have increased, albeit minimally. Sinclair and Dell (2000) reported an overall decrease in crime rates, from 607 per 10,000 youths in 1992 to 495 per 10,000 youths in 1997. The greatest decrease has been in property crimes, followed by the category of other federal statutes and other crime. Again, YOA and violent crimes increased somewhat. By specific offence, homicide, attempted murder and abduction rates remained stable, sexual assault and other sexual offences decreased, whereas robbery crimes and non-sexual assault increased. When these violent crimes were examined, a slight increase was evident, yet not one that would reflect the magnitude of youth offending portrayed by the media and evident in public opinion polls (Sinclair & Dell, 2000).

Most youth crimes are not violent. In 1992, 60% of youths charged with a Criminal Code or other federal statute offence were charged with a property offence, whereas just 14% were charged with a violent offence (Hung & Lipinski, 1995). Hung and Lipinski also demonstrated that, between 1986 and 1992, violent offending of adults and youths has increased at the same rate. It appears that the observed trend may reflect either heightened aggressiveness/violent

behaviour among various offender groups: adult males, females and male and female youth, or the society's growing intolerance of violent crimes, or perhaps both.

Andrews and Bonta's (1994; 1998) social learning perspective of criminal conduct can be informative when it comes to explaining the importance of the risk of re-offending in any individual, whether it be male, female or a Native person, a youth or an adult. Basically, it stresses that criminal behaviour can be predicted and that such predictability radically improves classification, supervision decisions, and treatment assignments (Andrews & Bonta, 1998; Wormith, 1997).

Social Learning Perspective of Criminal Conduct

Theory. An impressive amount of research has been conducted in corrections from the 1970s to the present. It is important for the empirical studies not to overshadow the significant changes in conceptualization that have occurred in the field and to recognize the theoretical advances that have been key in constructing the base of knowledge for corrections' policy and practice (Bonta & Cormier, 1999).

The notion of assessing risk and needs to guide forensic decision-making and to guide correctional supervision and rehabilitation comes largely from a social learning perspective of criminal conduct. The General Personality and Social Psychological Approach has been formulated as a result of reviewing the results from longitudinal and cross-sectional delinquency research (1970-1994) by Andrews and Bonta (1994; 1998). Within this theory, criminal behaviour is understood as a product influenced by an interaction of personal, interpersonal and situational (community) reinforcement (Andrews & Bonta, 1994; 1998). It includes the various classes of variables impacting on individual behaviour, "hierarchically ordered from the broadest context variables such as political, economic, cultural and socio-structural down to the person in

an immediate situation (Andrews & Bonta, 1994, p.113-114)". Such theory gives recognition to the broader social system and multiple developmental pathways responsible for the development, maintenance, and modification of the contingencies that guide individual behaviour.

Within the context of an immediate situation, antecedent and consequent events are considered very important for the analysis of behaviour, because they link the situational influences with the past learning experience and signal rewards and costs for that class of behaviour, providing indicators as to the likely outcome of certain actions. When rewards for antisocial behaviour outweigh the costs, the antisocial behaviour is likely to occur. This reward–cost ‘comparator’ mechanism works within a person’s cognitive and self-regulatory realm.

The model recognizes a central role of the antisocial attitudes, values and beliefs in the evaluation of a given situation as being favorable to crime (cost/benefit analysis), as they form cognitive standards of conduct. Criminal associates are also equally strong risk factors (Andrews & Bonta, 1994; 1998) since these associates provide antisocial modeling and impact on how the meaning of rewards and costs of such behaviour is negotiated. The model suggests that antisocial attitudes and criminal associates are particularly strong risk factors for delinquency. There is some evidence emerging from Hoge, Andrews and Leschied’s (1994) study of delinquent youth, that “an attitudinal variable might make a contribution to the prediction of criminal activity independent of the family and peer association variables” (p.557). These results emphasize the importance of cognitive mediation of antisocial conduct (through antisocial /anti-authority/procriminal attitudes and beliefs) and the central role of such a mind set in the promotion of criminal behaviour in young people.

In summary, the General Personality and Social Psychological model of criminal conduct provides an outline of paths (routes) to the occurrence of particular individuals in specific

situations, evaluated by them as favorable for crime. The model is “powered by a Big Four (4) predictor scheme - criminal history, criminal attitudes/cognitions, antisocial associates (social support), and antisocial personality traits - which all set against a framework of immediate situational facilitation” (Clements, 1999, p.390). These “Big Four” risk factors are the major psychological contributors to criminal conduct. Weaker (minor) correlates of crime include the following: parental criminality and supervision problems, family conflict, educational and employment status, and attachment. Andrews and Bonta (1994; 1998) explain that their “model does not assume that, for example, all young offenders are restless or aggressive and weakly tied to home and school” (1994, p.113). They emphasize that, as the number and variety of the more proximal risk factors increase, the probability of criminal behaviour increases rapidly.

The findings from the growing literature in developmental criminology (Day, 1998; LeBlanc, Cote, & Loeber, 1991; Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998; Loeber & Stouthamer-Loeber, 1996; Moffitt, 1993; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996; Stattin, Romelsjo, & Stenbacka, 1997) add support to this list of risk factors and claim that developmental (delinquency) pathways are best conceptualized as pathways with changing probabilities of outcome rather than fixed continuities or specific outcomes (Day, 1998). It means that they are open to influence and change. Path models suggest that the effect of early risk factors such as family problems (exogenous variable) are related to the development of subsequent risk factors such as school and peer problems (endogenous variables), which themselves lead to delinquency (endogenous variable). These data provide support for the early assessment of risk and protective factors as well as support for the close monitoring, through re-assessments, of any changes in dynamic risk/need factors, as they apply to different groups of offenders (low vs. high risk).

Offender classification. Andrews and Bonta (1994, 1998) were instrumental in increasing interest in the usefulness of risk and need classification and in the validity of instruments that measure risk and need in offenders. This is apparent in the growing literature on young offenders (Hoge & Andrews, 1996; Jung, Rawana & Lod, 1997; Ilacqua, Coulson, Lombardo & Nutbrown, 1999; Funk, 1999; Jung & Rawana, 1999; Cottle et al., 2001; Catchpole & Gretton, 2003). A social learning theory of criminal conduct stresses the importance of differentiating higher risk offenders from lower risk offenders and matching their needs with appropriate rehabilitative service (Andrews, Zinger, Hoge, Bonta, Gendreau & Cullen, 1990; Andrews & Bonta, 1998). Classification approach rather than prediction approach to risk assessment is being endorsed by the correctional system. The classification goal's key emphasis in risk assessment is "the extent to which it is able to identify groups of offenders with widely different rates of reoffending" (Wiebush, Baird, Krisberg, & Onek, 1995, p. 177). Wiebush and colleagues state that well-designed instruments are typically able to identify a group of high-risk offenders whose probability of recidivating is four to five times greater than the identified low-risk offenders.

Traditional approaches to decision making in juvenile justice have been described as "highly discretionary, subjective, and intuitive" (Wiebush, Baird, Krisberg & Onek, 1995, p. 174) and there has been only little research to guide risk assessments of future criminal behaviour, particularly violence, among adolescents and to demonstrate that we are able to estimate risks accurately (Grisso, 1998), which is beginning to change (Catchpole & Gretton, 2003). Most of the work in this area has been done with adults. Hoge and Andrews (1996, p. 22) confirm that, when it comes to youth, risk judgments are often based on "unsystematic and intuitive procedures and are of questionable validity."

Risk assessments are based on the Risk Principle and answer the following related questions: how likely is an offender to commit a new offence and what can be done to decrease this likelihood. Essentially, there are two assumptions related to the Risk Principle. One assumption is that criminal behaviour can be predicted based on the risk factors. These risk factors are characteristics of offenders and their situations that correlate with their future criminal behaviour (Andrews & Bonta, 1994, 1998; Bonta, 1995). For example, individuals with a history of prior convictions are more likely to commit a new offence than those without such a history (Bonta, 1995). Loeber and Farrington (1998) contend that the most serious and violent juvenile offenders tend to start displaying behaviour problems and delinquency early in life, pointing to the predictive significance of 'age of onset' and 'criminal history' variables.

Another assumption involves an argument that the level and intensity of treatment and supervision needs to be matched to the risk level of the offender. A contemporary research based on meta-analyses of large number of delinquency studies clearly supports the notion that the level of intensity of treatment should reflect the risk posed by an individual offender (Grisso, 1998; Krisberg, Currie, Onek & Wiebush, 1995; Lipsey, 1992; Wiebush, Baird, Krisberg & Onek, 1995). David Nussbaum (1999) notes the limits of this general principle with some currently available literature by pointing to the fact that intensive treatment leads to increased recidivism in psychopathic individuals, confirming that treatment must be specific to the offender's criminogenic needs, as per Andrews and Bonta's Responsivity Principle (discussed below).

In short, the current research indicates that treatment of offenders can "work" and tends to be more effective with higher-risk offenders (Andrews, Zinger, Hoge, Bonta, Gendreau, & Cullen, 1990; Andrews & Bonta, 1998; Gendreau, Little, & Goggin, 1996; Lipsey, 1992). Also,

it has been demonstrated that lower-risk offenders frequently gain less from treatment (Andrews, 1989; 1996) and that, in most cases, augmented services have no effect, or have negative impact on recidivism of low risk offenders (Andrews, Zinger, Hoge, Bonta, Gendreau & Cullen, 1990; Andrews, Kiessling, Robinson and Mickus, 1996; Andrews & Bonta, 1998).

The second principle of offender classification is the so-called Need Principle, which distinguishes between criminogenic and noncriminogenic needs, and argues that treatment to reduce recidivism should focus exclusively on criminogenic needs. These criminogenic needs are linked with criminal behaviour and, in a dynamic fashion, are predictive of it (Andrews & Bonta, 1994, 1998). They constitute critical offender problems and offender characteristics, which are changeable. Andrews and Wormith (1984) as well as Andrews and Bonta (1998) suggest that dynamic predictors are important because they are subject to change and, thus, may serve as treatment goals. When these problems and characteristics of offenders are targeted for change and then altered, they are associated with changes in the likelihood of recidivism. These changes in the dynamic predictors can be measured, so the changes in scores between the first and second assessments should be of interest to predict future recidivism (Andrews & Bonta, 1998).

No studies, to date, have evaluated whether change in a variable purported to be dynamic is related to a parallel change in risk, a requirement that must be met before it can be said that a variable is, in fact, a dynamic risk factor (Rice, Harris, & Quinsey, 2002). Some claim that the scales comprising mainly static (and not dynamic) risk predictors “give little credit to the offender who changes for the better nor do they inform the practitioner or supervising staff as to what needs to be done to reduce the offender’s level of risk” (Andrews & Bonta, 1998, p. 224). Unfortunately, the role of dynamic characteristics in violence risk assessment has become complicated and confused, for example when characteristics related to antisocial personality are

said to be changeable personal (i.e., dynamic) characteristics, whereas it is empirically unclear whether antisocial personality can be made to change and the stability of standard personality measures, especially in adults, is remarkably high (Rice, Harris, & Quinsey, 2002).

As previously mentioned, two major sets of dynamic criminogenic needs, which are widely supported by theories of crime, are criminal attitudes and criminal associates. Assessments of procriminal attitudes have consistently demonstrated significant associations with criminal behaviour among adult criminals (Andrews, Wormith & Kiesling, 1985; Bonta, 1990), and young offenders (Hoge, Andrews & Leshied, 1994; Hoge & Andrews, 1996; Simourd & Andrews, 1994). Of the dynamic risk/needs factors examined by Simourd and Andrews (1994), the most important were criminal attitudes, antisocial peers, temperament or misconduct problems, educational difficulties, poor parent-child relations, and minor personality variables. As in adults, young offenders' personal distress/anxiety variables were not strongly related to delinquency for either gender. This is not surprising, because traditional treatment targets such as anxiety or emotional empathy consistently failed to demonstrate predictive validity (Gendreau, Little & Goggin, 1996). They are secondary treatment targets since they have little impact on recidivism, or may have a negative impact, such that an improved self-esteem of a psychopath may augment his/her criminality (Nessbaum, 1999).

This last point is made explicit by Andrews and Bonta's Responsivity Principle of offender classification, which argues that treatment services ought to be tailored in accordance with the offenders' capacities, learning styles and personality characteristics. Treatment responsivity is a term that is used to describe client-based factors that influence the potential for positive treatment effects. It encompasses constructs related to treatability (treatment readiness and motivation), and is related to treatment response (method/personnel/environment) and

outcome (Serin & Kennedy, 1997). The responsivity principle stresses the importance of matching the treatment modality to the cognitive and personality characteristics of the offender suggesting, in general, that cognitive-behavioural interventions as opposed to, for example, psychodynamic therapies, are the more effective style of intervention for adult and young offenders (Andrews, Bonta & Hoge, 1990; Harris & Rice, 1997). Progress in treatment, along with other dynamic factors, are on a mnemonic list created by Harris and Rice in order to help clinicians to pay attention to those clinical factors for which there is relationship with violence. From the methodological point of view, the more assessment points (re-assessments at different time points in the offender's rehabilitation), the more reliable and valid the measurement of dynamic variables is.

The Professional Discretion Principle is the fourth principle of offender classification. It assigns a special value to the clinician's/administrator's judgment, which can be utilized to override the classification decisions based on the previous principles as they are evidenced in the use of special risk/need tools. Such careful clinical judgment, supported by empirical findings, can result in the lowering or heightening of the risk level for recidivism, impacting on supervision and treatment decisions for an offender. Authors of The Historical, Clinical and Risk Management Scheme (HCR-20), which is a violence prediction instrument for adults (see Appendix A), advise clinicians to "adjust the actuarial estimate only if there is sufficient justification to take account of current clinical factors" and recommend that "such adjustments be made sparingly (Webster, Douglas, Eaves & Hart, 1997, p. 260)".

Similarly, Girard (1999) found that the override of the actuarial LSI-OR estimate based on the standardized assessment process was endorsed by the assessors less than 3% of the time in her recent (large-sized) study of Ontario adult offenders (note that the rate of overriding is

reported to be about 15% across the province by the Ministry of Correctional Services). Girard (1999) observed a majority of the overrides used with the community offenders and, consistent with the principle of professional discretion, they did improve prediction of recidivism, albeit slightly. Harris and Rice (1997, p.1171) recommended that the “structured adjustment” (override) of the mechanically (actuarially)-derived classification scores be utilized, whereby a modest increase or decrease from “the anchor point”¹ would culminate in a full appraisal.

The role of dynamic risk factors (needs) in correctional assessment and intervention.

Most actuarial-based risk assessments have no theoretical basis (Andrews & Bonta, 1998) and consist almost entirely of static, historical items (i.e., prior criminal history, age, gender). They do not meet the principles of empirically valid prediction, such as the one recommended by the social learning perspective of criminal conduct, where dynamic predictors are considered potentially functional or causal factors of criminal behaviour. Such predictability improves when one uses a variety of predictors that include both static and dynamic variables.

Gendreau, Little and Goggin (1996) found that the dynamic predictor domains performed at least as well as the static domains with adult offenders ($r = .15$ vs. $r = .12$). Results from the Hoge, Andrews and Leshied’s (1994) study of predictors of delinquency provided general support for a model implicating dynamic variables such as attitudinal, family and peer variables in youthful criminal activity. The fact that the major dynamic correlates of criminal activity were essentially the same for boys and girls, may reflect the possibility that certain static predictors of delinquency, such as gender or age, may be of lesser importance in risk prediction when treated

¹ Harris and Rice (1997) declare that “structured discretion” accomplishes a task of incorporating clinical judgment by using the probability estimates from an actuarial tool as an anchor point and modestly increasing or decreasing them, taking into account clinical or dynamic factors (especially those not already considered in the research used to develop an instrument).

in isolation, without considering their relationships with the dynamic correlates of crime (i.e., attitudinal factors, academic achievement, poor verbal ability, hyperactivity, impulsivity).

For example, in trying to answer the question of whether age is important in understanding delinquency, Bartush, Lynam, Moffitt and Silva (1997) found that poor verbal ability and hyperactivity were strongly related to childhood antisocial behaviour (ages 5-11), whereas delinquent peers was the more important correlate among 13- to 15-year-olds (Andrews & Bonta, 1998). Another example demonstrating a complicated relationship between static factors, such as age and gender, and between the dynamic correlates of childhood and adolescent delinquency (i.e., early disruptive behaviour and poor school achievement), is the study by Tremblay, Masse, Perron, Leblanc, Schwartzman and Ledingham (1992). They found that, for age 14 boys, frequency of delinquent acts appears to be more a function of behavioural stability since age 7, whereas antisocial emotions, attitudes, and values (personality variables) appear to be more a function of poor school achievement during elementary school. The picture for girls appeared to be somewhat different, with the path from childhood leading through poor school achievement to delinquent personality and delinquent behaviour. It is essential for those designing an intervention aimed at preventing adolescent delinquent behaviour and antisocial personality to understand the importance of the dynamic correlates of future delinquency, such as early disruptive behaviour in boys and poor elementary school achievement in both boys and girls.

A study by Landsheer and Hart (1999) recently demonstrated significant interaction effects between attitude and age in relation to criminality of adolescents. They observed that only the adolescents who were permissive of violence showed a clear age curve, whereas the adolescents with other attitudes (i.e., permissive of causing material damage) showed slighter

age differences. To put it in other words, adolescents who were permissive of violence determined the larger part of the age differences in delinquent activity of youth. “When this group was removed, the attitude–age interaction became insignificant (Landsheer & Hart, 1999, p.385)”. Among other conclusions, this research shows that attitudinal differences can contribute to understanding age differences in criminal activity. It is significant, because as Landsheer and Hart’s (1999) data show there is the persistent increase of delinquent activity from age 12 to 17 and they show that it is particularly significant for those delinquents whose attitudes are permissive of violence, equivalently for boys and girls (these same delinquents become much less delinquently involved from age 17 to 20, but the reasons for the change remain unclear).

In keeping with the development of and progress in empirical validation of a modern psychological theory of criminal conduct (Andrews & Bonta, 1994, 1998) and based on a growing knowledge of dynamic risk/need factors, a new generation of risk assessments has been developed, the broad-based risk and need assessment procedures, for they systematically and objectively measure offender needs, in addition to considering well-known static risk predictors. Various practical and effective risk and need assessment instruments for special offender groups such as violent, mentally disordered, sexual and psychopathic offenders have been developed (see Appendix A for a description of relevant instruments).

Some advocate that the dynamic risk factors predicting general recidivism may not predict specialized types of criminal behaviour, for example sexual offending or violent offending. It is believed, that to prevent sexual offence re-occurrence, the dynamic factors related specifically to sexual offence recidivism need to be considered (Hanson & Harris, 2000). Hanson and Harris (2000) found that the dynamic risk factors (needs) reported by the officers continued

to be strongly associated with adult sexual recidivism, even after controlling for preexisting differences in static risk factors.

When it comes to violence, there has been a belief, due to many methodological concerns, that the prediction of violent recidivism, including sexual recidivism, is not a very productive pursuit. But since John Monahan's (1981) influential book on predicting violent behaviour, there has been a great deal of research in this area resulting in improvement in the ability of clinicians and researchers to make these predictions (Douglas & Webster, 1999; Harris, Rice & Quinsey, 1993; Rice & Harris, 1995; Steadman, Silver, Monahan, Appelbaum, Robbins, Mulvey, Grisso, Roth & Banks, 2000). The fundamental problem is that in the general population violent behaviour is a low frequency event. Predicting events in the population with a low antecedent probability leads to "an unacceptable level of false positives (Wakefield & Underwager, 1998)." However, recent research on high frequency violence populations, such as prison population or those with a history of violence, indicates that the accuracy of predicting future violent behaviour can be improved over chance by the use of actuarial methods (Borum, 1996; Monahan, 1996; Rice & Harris, 1995; Webster, Douglas, Eaves & Hart, 1997). During the past 20 years the research questions have shifted from whether violence could be predicted to how violence prediction could be improved (Borum, 1996; Monahan & Steadman, 1996;).

The literature suggests that a social-psychological approach to understanding violent behaviour of youth can lead to promising approaches in prediction, when special consideration is given to the dynamic factors related to exposure to family violence through modeling and through early victimization (Leshied, Andrews & Hoge, 1993). Leshied, Andrews and Hoge cite specific examples from the violence and victimization literature, noting that young persons exposed to violent models have an overwhelmingly increased probability of becoming violent

toward family members and demonstrate a generalized increase in violence potential. The victimization literature supports the notion that persons victimized from a violent event (i. e., sexually abused victims) have an increased potential of becoming sexual perpetrators themselves.

The major findings from Leshied, Andrews and Hoge's (1993) review suggest a combination of predisposing characteristics and precipitating environmental factors which interact in a way which affects the probability of delinquent acts occurring (a social-psychological approach). A shift in these dynamic personal and/or situational factors affects the probability of offending. Again, these and other characteristics consistently identified in the literature on youth at risk suggest the need for broad-based classification systems to reflect the relevant predisposing and precipitating factors. These areas can be then appropriately targeted for treatment with awareness of criminogenic risk and needs (factors directly related to youth antisocial behaviour), and programs reporting high levels of program integrity. Andrews, Zinger, Hoge, Bonta, Gendreau, and Cullen (1990) claim that what works in correctional treatment is based on the following psychological principles: delivery of service to higher risk cases; targeting of criminogenic needs; use of modes of treatment (cognitive, behavioural) that are matched with client need and learning styles.

Finally, based on the example of the Level of Service Inventory-Ontario Revised (LSI-OR), Andrews and Bonta (1998) explained evidence for the dynamic validity of broad-based risk/need instruments. They reported Andrews and Robinson's, 1984, results which showed that probationers' (LSI-R) scores changed over a period of six months, and that these changes were associated with changes in recidivism. For example, probationers in the moderate risk range at intake, who did not change, had a recidivism rate of 33%. For those who showed reductions in

risk level at re-test, the recidivism rate was 0 percent. Interestingly, the individuals whose risk has increased due to experienced difficulties over the re-test period (their LSI-R's scores increased at re-test), showed increased recidivism rates at 40%. The finding that changes in LSI-R scores are associated with changes in recidivism supports the notion that these dynamic (changeable) items and subcomponents of the LSI-R may be criminogenic and could be useful treatment targets, which ought to be monitored by re-assessing individuals at different time points.

Young offender characteristics and protective factors. There are four static (unchangeable) powerful risk correlates (age, sex, age of onset, criminal history), yet there is a complex spectrum of other variables involved. The American Psychological Association (1993) and the research by Loeber, Farrington, Stouthamer-Loeber, Moffitt and Caspi (1998) present the findings on the development of delinquency, aggression and violence. Longitudinal findings identify child risk factors for male delinquency, including impulsivity, intelligence, personality, attitudes, and drug dealing. They review other risk factors such as hyperactivity, academic factors, family factors, macro factors (socio-economic factors, neighborhood) and peer factors.

Cunningham (2000) summarized the results of research on youth violence as multi-determined by the interaction of individual factors (e.g., biology, temperament), family factors (e.g., parenting style, exposure to violence in the home), cultural factors such as norms that promote or discourage violence, and situational factors (e.g., access to firearms, gang membership, limited opportunities for pro-social activities) (Cunningham, 2000, p.2)". The same is concluded by other authorities in the field (Hoge, Andrews & Leshied, 1994; Leshied, Andrews & Hoge, 1993).

A new perspective (Jessor, 1998) on predictors of multiproblem male juvenile delinquency found the following strongest associations: with externalizing problems, particularly a high attention deficit hyperactivity disorder (ADHD) score, covert behaviour, physical aggression, conduct problems, and slightly less strong between delinquency and substance use. Behaviours that tended to be developmentally proximal were more closely interrelated than behaviours that were developmentally more distal. Externalizing problems were consistently related to internalizing problems.

In addressing important questions about the parameters of delinquent careers, Moffitt (1993) as well as Lopez and Emmer (2000) distinguish the childhood-onset or life-course-persistent antisocial behaviour as qualitatively different from adolescence-limited delinquency. This life-course-persistent delinquency occurred in about 7% of Moffitt's male sample (Moffitt, Caspi, Dickson, Silva & Stanton, 1996) and seems to be related to such risk factors as attention deficit disorder with hyperactivity (ADHD), as well as other instances of impulse-control pathologies. Adolescence-limited delinquency occurred in about 24% of Moffitt's male sample (Moffitt, Caspi, Dickson, Silva & Stanton, 1996) and is likely not correlated with impulse control pathologies. Such findings emphasize that significant individual differences exist between offenders (Andrews & Bonta, 1994; 1998; Grisso, 1998; Hoge & Andrews, 1996; Lopez & Emmer, 2000) and that many factors operate simultaneously in development (Magnusson & Bergman, 1990; Stattin, Romelsjo & Stenbacka, 1997).

Many authors agree that problems with "clinically significant impulsivity" play a crucial role in the externalizing disorders of childhood, especially attention deficit hyperactivity disorder (ADHD) and conduct disorder (CD) (Zaparniuk & Taylor, 1997, p. 158). The concept of impulsivity is central to explanations of various problems of childhood including academic

difficulties, poor peer relationships (Milich & Kramer, 1984; Milich, Hartung, Martin & Haigler, 1994), consequences of frontal lobe pathology (Fuster, 1997) such as self-regulation problems (Shue & Douglas, 1992) and delinquency (White, Moffitt, Caspi, Bartush, Needles, & Stouthamer-Loeber, 1994; Zimmerman, 1995).

There is a recognized link between cognitive development and delinquency (Ross & Fabiano, 1985; Andrews & Bonta, 1998; Nussbaum, 1999). In their new edition of *Psychology of Criminal Conduct*, Andrews and Bonta (1998) examine the verbal/performance IQ “split”, demonstrating that delinquents and criminals appear to do relatively less well on verbal as compared to visual-spatial measures of intelligence. Nussbaum’s (1999) own work with delinquents has confirmed an advantage to visual-spatial attention relative to auditory attention in most referred young male offenders. In his opinion, this may reflect a relative difficulty in attending to verbal communication channels through which concepts of morality and prosocial attitudes are learned. These data are in accord with other findings, which contend that those people whose thinking leads to crime do not process information in the same way as others (Zimmerman, 1995).

As emphasized by Magnusson and Stattin and colleagues, there are few reasons to believe that adverse developmental features are the only operating factors underlying future criminality, isolated from positive personal or environmental characteristics. Instead, a variety of factors related to individual functioning tend to form a total configuration, with some factors balancing, competing with, compensating for, or reducing the impact of others (Stattin, Romelsjö & Stenbacka, 1997). This approach is in accord with a General Personality and Social Psychological model of criminal conduct, which constitutes a theoretical framework for the current study. For example, Hoge and Andrews (1996, p. 420) suggest an importance of

“demonstrating the role of both risk and protective factors in delinquency, considering the possibility that interactive effect might occur between the two sets of factors”.

Loeber and Stouthamer-Loeber (1996) and Hoge, Andrews and Leshied (1996) suggest that if the researchers use an extended scope of risk factors and do not neglect protective factors, it can improve our understanding of why some individuals become delinquent, but some others do not, and “how such factors affect the various aspects of delinquency processes: onset, escalation, de-escalation, and desistance (Loeber & Stouthamer-Loeber, 1996, p.17)”. Such developmental perspective is in harmony with Hoge and Andrews’ (1996) formulations of “aggregating and mitigating factors (p.20)” in delinquent youths’ careers. These factors may have an impact on decisions about youth at all stages of processing. The description of individual differences (dynamic factors) can explain considerable transformations in criminal careers, when youngsters grow older, and are experiencing the presence of known risk factors, such as parental influences, peer influences, and academic failure (Loeber & Stouthamer-Loeber, 1996; Stattin, Romelsjo, Stenbacka, 1997).

A study by Stouthamer-Loeber (1993) evaluated a broad range of potential risk and protective factors in relation to various indices of delinquency in a sample of boys between 7 to 14 years of age. She incorporated a range of family variables, including those relating to supervision-disciplinary practices, parent–child relations and parental stress. Her results demonstrated that the parental stress variable functioned as a risk factor in relation to delinquency, whereas the supervision-disciplinary and parent-child relations’ factors functioned as both risk and protective factors. Thus, what has been commonly considered as family-related major set of risk factors for delinquency does, indeed, consist of many variables, which may work in different ways depending on the presence or absence of other variables, the age and the

risk level. Only few differences were found in regard to the conviction rate between subjects with few and those with many documented resources among low-risk individuals, whereas presence of such resources made significant contribution to lowering conviction rates of high-risk offenders (Stattin, Romelsjo & Stenbacka, 1997).

The current research on delinquency in boys shows that “protective and risk effects often co-occur in the same variables, that few variables have the risk effect only, and none have protective effects only” (Loeber, Farrington, Stouthamer-Loeber, Moffit & Caspi, 1998, p.160). Thus, the risk and protective factors ought not to be thought of as separate variables, since one variable may play either or both roles, as represented by opposite poles of the same dimension, in interaction with age and the risk level (see: interaction models and effects, Hoge & Andrews, 1996; Loeber, Farrington, Stouthamer-Loeber, Moffit & Caspi, 1998; Stattin, Romelsjo & Stenbacka, 1997).

More specifically, protective effects were found to be as likely to promote nondelinquency as to suppress serious delinquency. In contrast, risk effects were as likely to suppress nondelinquency as to promote serious delinquency (Loeber, Farrington, Stouthamer-Loeber, Moffit & Caspi, 1998). Loeber and associates found the following correlates of desistance in offending by male young offenders: low social withdrawal, low disruptive behaviour and positive motivational and attitudinal factors. More research is needed to examine factors that influence young offenders’ desistance from delinquency.

Existing Youth Risk/Need Devices

There is a range of risk/need instruments available for youth, but most of them are narrow in scope, that is, they do not assess an adequate range of risk/need factors within the instrument (Grisso, 1998; Girard, 1999). Many of these were collected, reprinted, and reviewed by Wiebush

and colleagues (1995). In most cases, their validity is not known. However, they are useful, because they increase the confidence of the assessor who is able to use a consistent set of (defined) risk factors, allowing the user to assign objective ratings based on those factors (Grisso, 1998).

For most of the risk and need screening devices, ratings are summed to produce a score. The criteria are provided that allow translation of the score into a level of risk or a type of placement within the juvenile justice system. These tools are presented by Wiebush, Baird, Krisberg and Onek (1995) as useful for various rapid decision making, such as pretrial detention, various placement decisions and, if they include assessment of needs, also useful for treatment decisions. Importantly, they improve consistency of correctional decision-making and improve effectiveness of resource allocation (Wiebush et al., 1995). In general, however, “they do not guide the clinician to make the finer discriminations (e.g., dimensions of past violent behaviour)”, because they do not include many factors which are thought to be important risk and need factors associated with future harm to others (Grisso, 1998, p. 154).

The broadband risk and risk/need systems, which are also used to identify critical (dynamic) offender needs/problems, have more value in assessing risk for future antisocial behaviour of youth (Hoge & Andrews, 1996). More complex scales/assessment systems provide more information on the important dynamic factors, yet some of the dynamic needs are subject to wide interpretation (e.g., emotional stability, family functioning) and the score will depend on how well these items are defined and on the processing of the information by the assessors. Some express concerns about the way in which the scores may be arrived at in light of the fact that the broadband instruments rely on information collected through clinical interviews and

observations, reviews of other assessment information and file information, dealing with a lot of clinical and dynamic variables, which are complex to measure and weigh.

Despite the above concerns and in spite of the limited information about the reliability and validity of the procedures, Leshied, Andrews and Hoge (1993) suggest that the broad-based classification systems reflecting the relevant predisposing and precipitating factors for youth criminality are also promising for violent offenders. They give examples of the promising approaches, such as the Youth Level of Service Inventory system (YLSI; Andrews, Robinson & Hoge, 1984). It was derived from the Level of Service Inventory (Andrews, 1982). The YLSI was developed for Phase I young offenders (12 – 15 year-olds). It was analyzed by Scott in 1985. The psychometric properties of the YLSI were examined in that study. Scott used a variety of recidivism measures on a sample of 84 youth having contact with the Ottawa juvenile probation offices. The results of the study showed the YLSI had acceptable psychometric properties and was positively associated with both level of supervision and various measures of recidivism. In a study by Simourd and colleagues (1994), the YLSI proved acceptable levels of reliability and internal consistency.

Jung, Rawana and Lod (1997), applied the YLSI instrument to young offenders (custody/probation and male/female), in one of Northern Ontario's large areas, over-represented by Natives. The follow-up period was 6 months after the assessment date (probation) or after the release (custody). Recidivism was defined as any offence committed during the six-month follow-up. The results supported the validity of the instrument for assessing a young offender's risk for re-offending. The study showed that the eight risk/needs factors of the YLSI were relevant to and important in differentiating recidivists from non-recidivist youth and that the

instrument was robust with respect to jurisdiction (could be used in other jurisdictions), ethnicity (Native vs. non-Native) and sex (Jung, Rawana & Lod, 1997).

Another adaptation of the LSI, and the recent modification of the YLSI, has been introduced for use with children and adolescents and with the Phase I young offenders (12–15 year-olds). It is called The Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 1994). This version is similar to the YLSI but has case management components incorporated into it. Hoge and Andrews (1996) describe the six major components of the YLS/CMI, which consists of a set of 42 risk/need items identified in the research literature as related to juvenile criminal activity, divided into eight subscales (see Hoge & Andrews, 1996, for more detailed information on the individual risk/need factors). There is also an opportunity in this section to indicate areas of strengths. This instrument has five additional parts, which are the following: Part 2—where the calculation of a total risk score takes place and a graphic summary of scores across the eight risk/need domains is plotted; Part 3—where variety of non-criminogenic needs are evaluated; Part 4—where mental health professional records his or her own estimate of risk and needs in the youth; Part 5—provides for an indication of the contact level recommended for the youth, and Part 6—allowing professional to recommend a case management plan. Such a plan requires stating specific treatment goals and means of achieving these goals.

The YLS/CMI has several potential strengths, among which there is one stemming from this instrument's very broad assessment of factors known to be associated with youth criminality. Also, the inventory provides information about characteristics of the youth and their needs, both criminogenic and non-criminogenic, as well as aggravating and mitigating circumstances (Hoge & Andrews, 1996). Such characteristics are “amenable to change and may provide information about responsivity or amenability to treatment” (Hoge, 1999, p. 259). Information about

criminogenic needs and responsivity are crucial for the effective decisions about intervention/treatment strategies to be made. The YLS/CMI is a relatively new instrument and only preliminary psychometric data are available on it (Hoge & Andrews, 1994, 1996). However, considerable psychometric support is available for instruments on which the inventory is based, the YLSI (Andrews, Robinson & Hoge, 1984; Simourd, Hoge, Andrews & Leshied, 1994), and the LSI (Andrews & Bonta, 1995).

Shields of the Ottawa–Carleton Detention Centre developed another version of the LSI instrument to assess risk and needs of delinquent youth, called the Young Offender–Level of Service Inventory (YO-LSI). The validity of the YO-LSI was initially established by Shields and Simourd (1991), where the YO-LSI was used to distinguish predators from nonpredators and showed satisfactory interobserver reliability and internal consistency. The results showed that predators had more extensive criminal histories and criminal sentiments. A considerable empirical validation with respect to probation samples was demonstrated. The validity of Shield’s YO-LSI was recently replicated by Ilacqua, Coulson, Lombardo and Nutbrown (1999). It appears that the YO-LSI inventory is a reliable predictor of criminal behaviour for both male and female young offenders. An examination of the categories of risk contained in the inventory, which consists of 76 items, shows no significant difference between general areas of risk and need for male and female young offenders.

In the meantime, a new version of the LSI instrument for adult offenders, the Level of Service Inventory–Ontario Revision (LSI-OR; Andrews, Bonta & Wormith, 1995), has routinely been in use within the Ministry of the Solicitor General and Correctional Services’ Phase II young offenders (16–18 year-olds). As already established, there is a considerable support for the predictive validity of the LSI-OR (Andrews, Bonta & Wormith, 1995), an interview–based,

multipurpose assessment instrument, with adult offenders. However, there is virtually no information on its reliability and validity when used with young offenders. Previous research has emphasized the importance of evaluating the validity of any risk-screening instrument (Ashford & LeCroy, 1988; Wormith & Goldstone, 1984). Some even argue that risk instruments should be validated every two years (Wormith & Goldstone, 1984). In any case, the LSI-OR's use with young offenders without the validation on that population places the institution at risk of using the instrument, which may be invalid with regards to both construct validity and predictive validity.

The Level of Service Inventory–Ontario Revision (LSI-OR; Andrews, Bonta & Wormith, 1995.)

The content and format of the LSI-OR instrument (Appendix B) reflect the recommendations that were generated from the province wide review of its previous version, the Level of Service Inventory (LSI; Andrews, 1982). Over the past 20 years, LSI presented a classification method for probation and parole offices in Ontario, since it assesses both an offender's risk level and needs (Andrews, 1982). The LSI-OR, like the LSI, focuses on both static and dynamic, major and minor, risk factors that have shown predictive criterion validity: a history of criminal behaviour, procriminal cognitions and attitudes, procriminal associates, criminal personality, substance abuse as well as home, leisure and school/work related problems (Andrews, Bonta, & Wormith, 1995; Gendreau, Little, & Goggin, 1996).

In addition to the changes in format and structure, there are eight major changes that were made to the LSI in order to produce the current LSI-OR instrument. Some of these changes will be discussed in the following content. Certain LSI items that were not criminogenic and lacked predictive validity were eliminated (i.e., accommodation, recreation, etc.). The scoring of the instrument was changed, strengthening the role of the General risk/need factors (Section A),

which currently produces the score out of the sum of its checked items (minimum = 0, maximum = 43) and is used in the Risk/need summary (Section D), to arrive at a summary (profile) of the risk/need level for a particular offender. Supplementary to the Section A, Sections B and C, were introduced as well. They enclosed additional, criminogenic, and specific to the offender's personal and institutional development (adjustment) risk factors. Section B's items were to be recorded in the Risk/need summary (Section D) of the LSI-OR instrument, next to the Section A and Strengths, using it to override the statistically (mechanically) derived overall risk level of the offender.

This is a significant change to the previous instrument because it is based on the assumption that these Specific risk/need factors (Section B), and also Strengths, all possess an incremental predictive validity, above and beyond Section A's contribution to the prediction of recidivism in offenders. The introduction of the clinical override was, in itself, another important change to the LSI-OR instrument. Presently, making a modest adjustment (up and down) of the mechanically derived overall score, based on dynamic factors, is recommended by the authors of other risk/needs tools such as The Historical, Clinical and Risk Management Scheme (HCR-20) developed by Webster, Douglas, Eaves and Hart (1997), and The Violence Risk Appraisal Guide (VRAG), a 12-item tool, that has shown impressive predictive validity for violent re-offending among mentally disordered and violent offenders (Harris, Rice & Quinsey, 1993; Rice & Harris, 1995) (see Appendix A for a discussion of the specialty risk/need assessment tools).

The most vital change to the LSI instrument was increasing the number of risk levels from three (low, medium, high) to five on the LSI-OR instrument (very low, low, medium, high, and very high). Subdividing the low and high-risk levels onto low and very low, and high and very high, accomplished this objective. A five-level risk system compared to a three-level system

of the earlier versions of the LSI was conceptualized as capable of making more precise decisions regarding the classification and risk level of the offender. The research shows that a linear relationship exists between the risk level of an offender and the probability of recidivism even if the correlation representing the relationship is low, such that false positive and negative errors can be further reduced by discriminating or separating lower- and higher-risk offender groups on the basis of small differences between the groups (Girard, 1999).

Besides the above mentioned changes, the LSI-OR benefited from the introduction of the Other client issues, Section F, and the Special responsivity considerations, Section G, to the LSI-OR instrument, both devoted to the identification of important but noncriminogenic needs and not counted toward the risk/need assessment total score. This added important information about the needs of offenders that could affect treatment readiness, performance, and its amenability (Serin & Kennedy, 1997; Serin, 1998).

Regarding the LSI-OR instrument, as it presently exists, it has been divided into eight sections and includes an appendix for supplementary information. The Appendix B reveals the order of the LSI-OR's sections: A. General Risk/Need Factors, B. Specific Risk/Need Factors, C. Prison Experience: Institutional Factors, D. Risk/Need Summary, E. Risk/Need Profile, F. Other Client Issues, G. Special Responsivity Considerations, H. Program/Placement Decision. The LSI-OR instrument has 43 items, which are grouped into these eight categories (Scales).

More specifically, the General risk/need factor (Section A) encompasses the following: (1) criminal history (8 items), (2) education/employment (9 items), (3) family/marital (4 items), (4) leisure/recreation (2 items), (5) companions (4 items), (6) procriminal attitude orientation (4 items), (7) substance abuse (8 items), and (8) antisocial pattern (4 items). Again, these eight

areas of risk/need reflect the risk/need factors supported by research findings as representing the major correlates of criminal behaviour (Andrews & Bonta, 1994, 1998).

The Specific risk/need factors, (Section B), is devoted to specific risk/needs items, which were added when the new version of the LSI-OR created in 1995. Again, this section is the result of consultations with the Ministry of Correctional Services, in consideration of the research literature and the Ministry staff's experience with the LSI-OR's earlier version, including their experience with the young offender supervision. The idea behind these changes was that these specific risk/needs could have significant clinical importance and affect the responsivity of a client to treatment or interventions. These items were thought to be criminogenic in nature and useful for overriding the actuarial-based risk level (Wormith, 1997) determined from the General risk/need factors (Section A) of the LSI-OR, based on the assumption of their incremental predictive validity.

Specific risk/need factors (Section B) are conceptualized as personal problems with criminogenic potential (14 items) and also include history of perpetration (9 items) (see Appendix B). These Specific risk/need factors (Section B) total scores are to be recorded in the Risk/need summary (Section C), where they are expected to be integrated with the General risk/need factors (Section A) and with the Strengths' scores, in order to determine the overall risk level of an offender. Again, the Specific risk/need factor (Section B) samples dynamic risk/need factors, which were correlated ($r = .52$) with the Antisocial patterns subscale in Girard's (1999) sample, supporting the idea that it assesses criminogenic factors related to antisocial personality. It correlated highly with the Criminal history ($r = .44$) and Procriminal attitudes ($r = .48$) subscales. Furthermore, the Specific risk/need factor section correlated significantly with the total Strengths in the expected negative direction, showing its dynamic character.

Overall, Section B performed very well in Girard's (1999) study, differentiating recidivists from nonrecidivists in her adult male sample. It means that adult male recidivists have more specific personal problems (i.e., antisocial patterns), which are related to violent offending when compared to nonrecidivists. Girard (1999) reported the following Specific (Section B) items that were significantly related to re-offending: problems with compliance, self-management skill deficits, underachievement, a history of physical assault, assault on an authority figure, and a history of escapes. Other items associated with violent re-offending were problems with compliance, anger management deficits, intimidating / controlling behaviours, and peers outside the age range.

Girard (1999) found that the Specific risk/need factors (Section B) performed better than the General risk/need factors (Section A) in the prediction of violent recidivism across all offender groups, including the special offender groups such as mentally disordered, domestic violence and sex offender groups, except for the young offender group. However, her YO sample was only 31 and her findings are tentative. The current study will undertake to analyze the performance of the LSI-OR's Section B in predicting violent recidivism of young offenders.

Forth and Tobin (1995) studied performance of the PCL-R (young offender version) on 95 male young offenders from secure custody and found more offenders classified psychopathic than commonly reported for adult male offender populations (37% vs. 15%-25%). These authors suggested that, possibly, some general characteristics of adolescence (e.g., impulsiveness, irresponsibility) might contribute to higher scores. Section B of the LSI-OR does not assess psychopathy as such, yet it contains one specific item directly addressing any evidence of psychopathy and, the whole Section B appears to assess criminogenic factors related to antisocial personality (Girard, 1999). Interestingly, it includes items related to self-management and anger

management skills deficits, intimidating/controlling behaviour and other clinical/dynamic factors that are conceptually related to some of the core interpersonal and affective characteristics of psychopaths (Hare, 1996) and/or impulsive children and adolescents (Zaparniuk & Taylor, 1997).

Furthermore, the Specific risk/need factors (Section B) include 9 items encompassing the history of perpetration, which can be conceptually related to Factor 2 of the PCL-R (items that reflect a socially deviant lifestyle). In knowing that the finding of psychopathy makes a significant contribution to the prediction of violent recidivism (Harris & Rice, 1997), it is hypothesized that Section B of the LSI-OR, in some ways theoretically linked to the violent recidivism criterion, will be useful in predicting violent recidivism of young offenders. The present study will explore this issue in relation to the needs and recidivism of young offenders.

The current study will also look into how Strengths, Responsivity factors and Override perform in the sample of young offenders. In relation to the construct of Strengths, it is not that clearly defined by the authors of the LSI-OR. Their assumption underlying the inclusion of Strengths in the LSI-OR instrument is believed to be along the same lines as the data on compensatory, protective factors and special resources presented earlier. It is now understood by many (Magnusson & Bergman, 1990; Stattin, Romelsjo & Stenbacka, 1997; Loeber, Farrington, Stouthamer-Loeber & Van Kammen, 1998) that adverse developmental features do not operate in isolation from positive personal or environmental characteristics. They interact in complex ways.

Based on the knowledge to date, it is hypothesized that consideration of strengths is likely to enhance predictive accuracy of the LSI-OR. It is supported by the results of Girard's (1999) study, where Strengths total in her young offender sample correlated well with any

recidivism ($r = -.35$), in the predicted direction. Such a correlation was greater than the one she obtained with her adult sample. The LSI-OR introduces a structured way of scoring strengths. The Strengths Total is the sum of strengths notations checked in the General risk/need factors (Section A), with the minimum of zero and maximum of eight risk/need areas on which offenders receive a “very low” or “low” risk/need score. After these areas of strengths are summarized, the assessor has the opportunity to give positive reasons for lowering security/supervision levels or for releasing clients. However, this is entirely a subjective clinical decision as to how many and which strengths are required to lower the offender’s risk and by how many levels.

For example, participation in organizations might be viewed as a protective factor against the effects of physical punishment that is linked to future delinquency if such participation is absent (Loeber, Farrington, Stouthamer-Loeber & Van Kammen, 1998). Similarly, Hoge, Andrews and Leshied (1996) found that the effective use of leisure time, as well as positive peer relations, good educational achievement and positive response to authority are protective factors for youth and they are associated with lower levels of re-offending and more positive overall adjustment. This was confirmed by Grisso (1998), who reported Smith et al’s, 1995, findings about youths who did not engage in serious delinquencies despite the fact that they were in a high-risk group, with relatively transient families, poor, and abusive of the youth, and with family members often experiencing trouble with drugs and the law. They found that youths in this group “who did not engage in serious delinquency were more often committed to school, did well in school, intended to continue their education, were well attached to their parents, and associated with conventional peers who themselves were approved of by the youth’s parents” (Grisso, 1998, p.149).

These data indicate that the LSI-OR assessment creates an important opening for the assessor to focus on the presence of risk factors along with the areas of strength. Future research will probably refine the clinician's ability to identify youths with high-risk profiles who turn out to be the exception to the rule (Grisso, 1998). Also, interventions could benefit from this evidence of strengths and focus on the enhancement of factors, which may help the individual to deal with negative risk factors, not always amenable to change.

Another important feature of the LSI-OR is the concept of the clinical override. Practically, it means that every assessment requires that the practitioner review the risk level generated by the General risk/need subscales (Section A) and the Specific risk/needs factors (Section B), in conjunction with the client's Strengths. This requires a careful review and integration of all the information by the assessor, who subsequently either endorses or modifies the level of overall risk (Wormith, 1997). As already mentioned, the assessor now has the opportunity to either give positive reasons for lowering the overall risk level or to list added concerns (e.g., finding of psychopathy, extreme minimization/denial of offences, substance abuse, uncooperation with supervision and mood deterioration/increased anger) for increasing the overall risk level in sexual offenders (Boer, Wilson, Gautier & Hart, 1997; Hanson & Harris, 2000). Such process reflects the principle of professional discretion, endorsed by a General Personality and Social Psychological theory of criminal conduct. It recognizes that empirically based decision making is, by definition, founded on existing evidence and that special conditions having to do with settings, offenders, workers, and managers may render that information less or more relevant than is typically found under routine conditions.

There is also Section F of the LSI-OR, called Other client issues, which is devoted to the identification of noncriminogenic needs which may, in complex ways, have an indirect impact

on offender's changing risk level. Noncriminogenic needs are derived from personality variables such as personal distress, self-esteem and anxiety (Serin & Kennedy, 1997) and are considered less relevant targets for treatment than criminogenic needs such as feelings of hostility and anger or substance abuse (Andrews & Bonta, 1994, 1998; Bonta & Cormier, 1999). However, attending to them may have an indirect impact on other treatment areas (criminogenic needs) and, thus, on the probability of reoffending. It is important, because in most correctional agencies today, "treatment is viewed as an integral part of the risk management continuum and offender responsivity is a critical issue for correctional programs" (Serin & Kennedy, 1997; Serin, 1998). The responsivity principle states that styles and modes of treatment service must be closely matched to the preferred learning style and abilities of the offender to enhance efficacy (Bonta, 1995). Bonta and Cormier (1999) suggest that offender characteristics affect how they will respond to a therapist or treatment.

Section F of the LSI-OR consists of 18 items reflecting social, health, and mental health problems (financial/accommodation problems, homelessness, health problems, depression, low self-esteem, learning disability, victimization, etc.). However, it may lack specific items related to developmental conditions known to be linked to delinquency, even though they are not being causal of it (ADHD, Fetal Alcohol Syndrome, Trauma Disorders, Brain Syndromes, etc.). Harris, Rice and Cormier (1991) reported that psychiatric factors such as psychotic disorders or schizophrenia were negative predictors of recidivism and Girard (1999) observed that Section F of the LSI-OR was inversely related to general and violent recidivism. It means that, in those studies, offenders who did not recidivate had more mental health problems than those who did recidivate. Yet it is worth noting that recent research efforts, including two large-scale epidemiological surveys, and a new generation of risk studies that improved on the limitations of

earlier research now suggest, that “mental disorder may be a robust and significant risk factor for the occurrence of violence “(Borum, 1996; Webster, Douglas, Eaves & Hart, 1997). Monahan indicates that mental disorders of various kinds do correlate with actual violence as measured during the follow-up studies (Monahan, 1996; Webster, Douglas, Eaves & Heart, 1997). Again, Monahan emphasizes the role of current psychiatric symptomatology and stresses that psychiatric diagnosis by itself is not a strong predictor of violence as compared to substance abuse, for example. Hence, it would be vital to know about present delusions or hallucinations, for example, and it would be necessary in some cases to address specific effects of insults to the brain (Bowman, 1997).

Finally, regarding Section G, Bonta and Cormier (1999) listed several potential responsivity factors but cautioned the reader that these factors should be viewed as tentative, because there has been very little research conducted in this area, particularly with offenders. He suggested that each of the general population responsivity factors might be present in the offender group, like in any other client group. These are anxiety, self-esteem, depression, mental illness and age. It is Bonta and Cormier’s (1999) opinion that these factors regulate the ways in which clients respond to treatment and learn from instruction. He indicates that some responsivity factors are more common in offender populations. Generally, these are poor social skills, little internal motivation to change and concrete orientation in their thinking. Many of such factors relevant to young offenders were reviewed earlier in this paper (i. e., reference to lower verbal abilities and stronger perceptual/spatial intelligence). A perusal of these factors makes it clear that structured behavioural intervention is more effective than other treatment strategies with offenders. Other responsivity factors are no more common in offenders than in any other client group (i. e., anxiety or shyness can be found in anyone), yet they affect

responsivity to treatment (Bonta & Cormier, 1999). For example a shy and anxious person may not benefit from group therapy, where people have to perform in front of each other.

The Section G of the LSI-OR allows for the sampling of the responsivity factors that may affect the choice of the most appropriate style and mode of service for the offender (Girard, 1999). It contains important items, such as “other evidence of distress” or “other clinical issues” which may have an indirect impact on an offender’s changing risk level through a moderating effect on interventions as a result of the client’s responsivity. Offender’s responsivity to external influence (e.g., treatment mode, therapist’s influence) will interact with his/her internal processes and produce dynamic changes in motivation. Serin and Kennedy (1997) and Serin (1998) emphasize the importance of an extensive assessment of criminogenic treatment targets, the need for programs of high integrity and appropriate matching of offenders to treatment modalities, consideration of therapist and offender characteristics, and assessment of treatment readiness. It is important to note, that the treatment may be more appropriate and its effects may be maximized if the responsivity of the client to that intervention can be affected.

In summary, the LSI-OR instrument appears to provide a well theoretically grounded and comprehensive assessment of an offender’s risk level, treatment needs, as well as protective and responsivity-related factors. Moreover, the LSI-OR is consistent with the principles of effective correctional intervention because it incorporates a variety of historical (static) and dynamic risk/need factors. Also, it measures both major and minor risk factors and includes noncriminogenic needs, which are important in terms of an offender’s response to treatment, which should be optimized. In addition, it allows for combining a systematic assessment based on statistical and clinical principles through the use of strengths and overrides. It ensures consistency across different assessor groups through special (province-wide) training sessions

and through a well-developed manual, which defines and describes the meaning of individual items as well as the scoring options, accompanying the instrument for an ongoing reference. This effort enhances the consistency and reliability of the instrument.

Purpose of the Present Study

The primary purpose of the present research was to conduct a longitudinal study on the predictive validity of the Level of Service Inventory-Ontario Revision (LSI-OR) with older (phase II) young offenders. The Ministry of Correctional Services in Ontario has used the LSI-OR instrument with older young offenders, but only little information is available on its utility with this population (Girard, 1999). Recently, Girard found that the instrument distinguished between young offenders who recidivated and those who did not among a small sample of delinquent youth ($n = 31$). Young offenders in her study recidivated at an overall rate comparable to that of adult offenders (general recidivism = 56.3%, violent recidivism = 43.8 %), indicating that older adolescent offenders may be appropriate clients for an LSI-OR assessment in spite of the fact that the instrument was developed for adults. Girard reported a correlation coefficient between the LSI-OR instrument's total score and recidivism for 31 young offenders in her sample to be $r = .37, p < .05$. This finding is consistent with the prediction made by some authorities (Clements, 1996) that there will be increasing overlap between adult-oriented instruments and practices for older juveniles.

However, Girard's results on the applicability of the LSI-OR to young offenders are tentative and need to be replicated on a larger sample. The present research has undertaken such a task. It has also included various comparisons between institutional and community offenders. More specifically, it has attempted to determine the relationship between various aspects or components of the LSI-OR (the General risk/need factors section, the Specific risk/need factors

section, the Strengths, the initial and final risk levels (override)), and various measures of recidivism.

The main purpose of this study is to determine whether the General risk/need factors' subscales, alone or in combination with the Specific risk/need factors subsections, and Strengths' variable, are predictive of recidivism in young offenders (i.e., predictive validity). It was also designed to examine the performance of the LSI-OR's newly added sections (B, C, F, G), by assessing their incremental predictive validity. Moreover, it undertook to determine the best predictors of recidivism by exploring the incremental predictive validity of the scales' minor predictors, other than the theoretically established 'Big Four' predictors (Andrews & Bonta, 1998). Finally, the current study sought to determine whether the LSI-OR classification (risk system) is adequate and whether the final risk level endorsed by an assessor following the use of the clinical override is a better predictor of re-offending than the initial risk level.

Specific Hypotheses

1. It is hypothesized that the LSI-OR is reliable and has predictive validity when used with the young offender population. This will be assessed in the following ways. The LSI-OR will classify young offenders' risk levels in such a way that high and very high risk offenders would re-offend at a significantly higher rate than offenders from low or very low risk categories (4 or 5 times greater than the identified low-risk offenders) (Wiebush et. al., 1995). There will be a linear relationship between risk levels and recidivism. The instrument will predict recidivism in young offenders at the respectable level, with predictions of general and violent recidivism being highly significant (i.e, exceeding the $r = .40$ level for general recidivism).

2. LSI-OR instrument should be applicable to both subgroups of offenders. It is hypothesized that those who were sentenced to custody will score significantly higher on various LSI-OR variables and will recidivate at the significantly higher rate than the community offenders.
3. It is hypothesized that the LSI-OR Section A (the four major and four minor risk factors) and Section B (specific risk/need factors) will perform better than Section C (institutional factors due to prison experience), Section F (other mental/health issues), and section G (special responsivity factors) in prediction of young offenders' recidivism.
4. It is hypothesized that the LSI-OR's Section B (special criminogenic risk/needs factors) and Strengths will add incremental validity to the Section A, particularly for prediction of violent recidivism of youth (Girard, 1999) when multiple regression analyses are used to create predictive models.
5. It is hypothesized that sections B, C, F, and G of the LSI-OR will demonstrate incremental predictive validity, above and beyond the Location (custody-community) and the LSI-OR General risk/need factors' (Section A) contributions, the latter section having constituted the core component of the original instrument.
6. Research indicates that the eight major risk factors are the strongest correlates of recidivism, the "Big Four" plus an additional minor set of risk factors. Since these factors are sampled in the General risk/need factors section of the LSI-OR, it is hypothesized that the Criminal history, Companions, Procriminal attitudes, and Antisocial pattern (major predictors) will have the strongest correlations with recidivism.

7. It is hypothesized that the declared risk level following the use of an override will be a more accurate predictor of recidivism than the initial risk level.

Methodology

Sample Size, Selection Criteria, Power

The criteria employed in the young offender sample selection process were as follows: firstly, the catchment's area for the cohort was selected based on the physical accessibility principle, due to a great dispersion of the respective probation offices in the Northern Ontario region. A geographically based selection of correctional settings appeared to be typical for Northern Ontario, with one central secure and several smaller open custody settings, in addition to two large probation offices with their remote satellite offices. Secondly, young offenders were drawn from the Ministry's database, based on their natural admissions to the system during the period from July 1, 1997 to June 30, 1998. The original list of admitters to the correctional system during the above-specified period comprised 397 names, yet the final YO sample consisted of only 154 participants.

The loss of data is attributed to the following reasons. Firstly, the source of the predictor data, the Level of Service Inventory-Ontario Revised (LSI-OR), was not available for 39.5 % of the participants, narrowing the sample down from 397 to 240 participants. The reasons for such considerable attrition were as follows: (a) some LSI-OR copies were missing from the files across various sites; (b) some offenders' files were moved to remote locations, being not easily retrievable; (c) some inactive files were sent to central government archives and were no longer accessible; and (d) some short-term incarcerated youth were not assessed due to the Ministry's policy that the LSI-OR assessment does not have to be completed for custody offenders with sentences of 30 days or less. Secondly, an additional sample reduction occurred, due to the exclusion of gender and ethnicity as variables, because the numbers of subjects did not warrant their inclusion (i.e., 53 females and 42 offenders of native origin). Aboriginal and female

offenders were eliminated from the group of 240 subjects, reducing the number to 154, since their unique quality precluded their merge with the remaining Caucasian male young offenders.

Finally, the 154 Caucasian male young offenders from northern Ontario constituted the current sample. They were all between 16 to 19 years of age at the time they committed their Index Offence ($M = 17.46$, $SD = 0.75$). Index Offence was defined as the offence or set of offences for which the offender was admitted to the correctional system during the Admission Period (July 1, 1997 to June 30, 1998), subsequently having been administered the LSI-OR. The LSI-OR instrument is an actuarial survey of an offender's personal and social history, and it is the Ministry's policy to administer the LSI-OR at intake or admission for all young offenders both in secure and open custody and for all probationers and parolees. The LSI-OR is required to be readministered every six months for any subsequent decisions related to the offender. The information to score the instrument was obtained through a structured interview and validated through the use of the official records by the trained Ministry staff. Some of these employees were at a masters or doctoral level of training in psychology, some were social workers with various levels of education, and some were correctional workers and probation officers, a rather broad scope of professional background and experience. Only those who received training in the administration of the LSI-OR were involved in the completion of the assessments on the participants of the current study.

The custody-community split in the current sample of 154 was 37 % youth in custody and 63 % youth in community. In contrast, the provincial custody-community split is 12 % youth in custody and 88% youth in community groups (Underhill, 2002; Wormith, 2002, personal communication). In addition, 66.7% of custody offenders were placed in secure, as opposed to open custody. As such, the custody offenders are over-represented in this sample compared to

the provincial average. Therefore, the community offenders are underrepresented and these groups are studied separately.

The admission period baseline was established as July 1, 1997, allowing the time for the correctional staff's training in the usage of the LSI-OR instrument, since its official introduction was in 1996. It was selected based on the requirement of a sufficient follow-up time, which would allow for the study of actual recidivism rates with confidence. A formal follow up period was 3.5 years, from June 1998 to December 2001.

Recidivism data were collected from existing Ministry of Correctional Services' databases, the Offender Management System (OMS) and the Offender Tracking Information System (OTIS), which replaced OMS in August 2001, as well as from the RCMP's Canada-wide database, the Central Police Intelligence Computer (CPIC) system. The Level of Supervision Inventory-Ontario Revised scores were obtained from a hard copy of offender files at the Ministry of Correctional Services' secure custody facility and from probation offices. Information detailing the subjects' demographic/legal characteristics and pre-index offence history were obtained from the Ministry's former and current offender databases.

A priori power computations were completed, based on the effect-size estimates derived from previous research (Gendreau, Little, & Goggin, 1996; Girard, 1999) and theory (Andrews & Bonta, 1994, 1998). "GPOWER" computer program (Faul & Erdfelder, 1992) was used for various designs, such as t Test for Correlations, t Test for Means, F test on Means in the Anova, F test in Multiple Regression, and Chi-Square Tests. These tests demonstrated a generally sufficient statistical power for the sample in the proposed research. To illustrate the results of the F-Test in Multiple Regression, when alpha was set to 0.05 and power was .80, high power by Cohen's (1969, 1988, 1990) criteria, the recommended sample size should be 118 given the

effect size of 0.15 (10 predictors). It means that, with the lesser number of predictors, and with the total sample of 154, as well as the community subsample of 97, the F-tests in Multiple Regression should have sufficient power.

However, for the custody sample of 57, the statistical power in F-Test in Multiple regression would be low, when all other conditions remained the same and there were 10 predictors (Task Force on Statistical Inference, APA Journals, 2000). The highest number of predictors that will be utilized in the current research is nine (i.e., recidivism model including 'location' and eight subscale predictors). Other models enclose two or six independent variables apparently constituting less of a problem with statistical power that could lead to Type II error. However, for the custody group ($N = 57$), at the conventional .05 level of p , and levels of r which may be conceptualized as small ($r = 10$) to medium ($r = 30$), the likelihood of a Type II error occurring is 18 times greater than the chance of performing a Type I error (Rosnow & Rosenthal, 1992). Therefore, by testing the predictive multiple regression models of recidivism in the current study on all young offenders ($N = 154$), the Type II to Type I error ratio will be reduced from 18 to 3 (Rosnow & Rosenthal, 1992, p.300).

Measures

Level of Service Inventory-Ontario Revision (predictor measures). The LSI-OR is an interview-based, risk/need assessment instrument, which allows for a systematic quantitative survey of an offender's personal and social history, obtained through the structured interview and the use of file information and official records. The Ministry of Correctional Services trains its employees to be able to administer the LSI-OR at intake or admission to all young offenders both in secure and in open custody and for all probationers and parolees. The LSI-OR is intended to be re-administered every six months for decisions related to the offender and to monitor his/her

treatment-related or general progress yet, for practical reasons, this expectation is not always fulfilled. The instrument's format (sections, subscales and specific items) was previously described. The LSI-OR is displayed in the Appendix B section. The LSI-OR Section A, the General risk/need factors' section, yielded a total score and eight risk/need subscales scores for, namely, Criminal History (8 items), Education/Employment (9), Family/Marital (4), Leisure/Recreation (2), Companions (4), Substance Abuse (8), Procriminal Attitudes/ Orientation (4), and Antisocial Pattern (4).

The LSI-OR Section B, the total Specific risk/need factors' section, yielded a total score and two subscale scores for, namely, Personal problems with criminogenic potential (14 items) and History of perpetration (8). A total General risk/need factors score, its eight subscale scores, a total Specific risk/need factors score and its two subscale scores, as well as a total strengths score, initial risk level prior to the use of the override, and final risk level following the use of the override, constituted the main independent variables of the study.

Research indicates that the LSI-OR has predictive validity for both male and female adult offenders for general and violent recidivism, reincarceration, and new offences (Andrews & Bonta, 1994; 1998). The instrument was validated on a large adult female population (Rettinger, 1998) and on a large adult sample of institutional and community male/female offenders, including violent offenders, exceptional offender groups, and young offenders (Girard, 1999).

Recidivism (outcome measures). General recidivism was the dependent variable and was defined as any conviction for a new offence, or any number of custodial admissions due to a breach/technical violation of release condition. Violent recidivism was broadly defined as any conviction for an offence involving crimes against persons, including offences that involve physical harm to other persons (e.g., homicides, serious violent offences such as robberies,

violent sexual offences such as rapes and sexual assaults, other assaults) and violent offences which did not necessarily involve physical contact with another person (e.g., attempted murder, uttering threats, vandalism and other forms of property damage, weapon related charges, arson) (Douglas & Webster, 1999). Please refer to Appendix C where violent offence types are listed among other offense categories as per The Ministry of Correctional Services' classification.

Recidivism data were collected from existing Ministry of Correctional Services' databases, the Offender Management System (OMS) and the Offender Tracking Information System (OTIS), which replaced OMS in August 2001, as well as from the RCMP's Canada-wide database, the Central Police Intelligence Computer (CPIC) system.

A dichotomous general recidivism variable was scored based on whether or not there were any convictions. A dichotomous violent recidivism variable was scored based on whether or not there were any violent convictions. A dichotomous nonviolent recidivism variable was scored based on whether there were any nonviolent convictions. The total number of (any) convictions was another important general recidivism variable. It was differentiated into the total number of violent and total number of nonviolent convictions. Following that, the total number of (any) charges variable was generated and differentiated into the number of violent and nonviolent charges. Based on the offence severity, in accordance with the Ministry's 26 offence severity categories (Appendix C), the most serious violent type of recidivism variable was differentiated from the most serious nonviolent recidivism variable. The extreme violent recidivism variable was created, which comprised three most serious violent offence categories (Ministry's categories 1-3): homicide, robbery, and violent sexual assault. The lesser violent recidivism variable comprised Ministry's categories number 5 (nonviolent sexual), 7 (weapons), 9 (mischief against the person), and 11 (assault related). The offence diversity measure was

included as well, based on total number of conviction types. Included was also a variable indicating a total number of recidivism events (sets).

For all recidivism combined, the variables scored were as follows: the total number of convictions (violent and nonviolent), the total number of charges (violent and nonviolent); the most serious conviction; the most serious offense (based on convictions and other charges); total number of conviction types (diversity); total number of charge types (broader concept of diversity); total number of recidivism sets; total number of breach convictions; total number of breaches (based on charges, including those convicted for); total number of fines; total number of suspended sentences; total number of conditional sentences; total number of intermittent sentences; total number of withdrawn charges; total number of outstanding charges; total sentence length/custody; total sentence length/probation. All together, there were twenty-one (21) recidivism variables collected for each offender, reflective of a broad (all-inclusive) definition of recidivism in the current study.

The three (general, violent and nonviolent) binary recidivism variables were intended to be the focal outcome variables of the current study. They were to be complemented by a continuous recidivism variable that would be selected from those that best represented the recidivism of the research participants, based on the magnitude of the predictor-outcome correlation coefficients.

The index offence measure. The Index offence measure was defined as the offence or set of offences for which the offender was admitted to the sample and, later on, administered the LSI-OR. Index offences were coded according to the Ministry's offence categories, distinguishing severity of offending, violent from nonviolent offending, the total number of charges, and the total sentence (order) length.

Follow-up period. The follow up period for young offenders in the study was a variable. All offenders were followed to their C-PIC investigation, December 2001. However, the start date of the follow-up period varied according to group membership. For the custody group, the beginning of the follow-up period was the provincial departure date, representing the potential discharge date. The provincial departure date meant the earliest date that the offender was released to the community and, consequently, was at risk for reoffence. For the custody offenders, whose criminal records, (based on the OMS/OTIS and CPIC data), indicated re-offending while being held in custody for the Index offence, Time-to-recidivism (otherwise known as the Lapse time) was scored zero. For the community offenders, the beginning of the follow-up period was the date of administration of the LSI-OR risk/need instrument, which took place between July 1997 and July 1998.

Time-to-recidivism. Time-to-recidivism was calculated from the time that an offender was in the community, and at risk for reoffence, to the date of sentencing for the first recidivating event as found on the C-PIC and verified by OMS data.

Procedure

The data collection took place in three phases. The first phase involved gathering the original LSI-OR's from the Northeastern Ontario Region for the purpose of the research. The respective custody and probation-parole sites were identified, based on an offender's admitting location and on the follow-up to the secure custody location, which could be an open custody and/or a probation location. Once these custody and community sites were all identified, they were either visited by the researcher (i.e., North Bay, Sudbury, and Sturgeon Falls sites) or approached in writing by the Ministry's management, who sponsored this research, in order to

provide the documentation to the researcher due to their remote location (e.g., Timmins, Elliot Lake, Kenora, Ottawa).

The originally scored LSI-ORs were collected and reviewed by the researcher. In order to enhance the reliability and validity of the LSI-OR instrument, when a scoring error was identified, it was adjusted accordingly. For example, on the Substance Abuse subscale, if an offender had a current drug problem scored but did not have the item indicating “drug problem, ever” scored, verification was sought from other LSI-OR items and the scoring error was adjusted, accordingly. The addition errors were also corrected. These corrections occurred in 4 cases only (2.6 %) and did not influence any changes in the offenders’ risk levels. When inconsistencies occurred between CPIC and OMS/OTIS data, the consultation with the research department of the Ministry of the Correctional Services was solicited (Underhill, 2001, 2002, personal communication) and the OTIS data were studied to clarify the offenders' criminal records.

Hard copies of the originally completed LSI-OR’s were numbered and stored by the researcher. From these copies of the LSI-OR, a master list with offender name, date of birth, Offender Management System number and Finger Print number was drafted in order to prepare for accessing the Ministry of the Solicitor General and Correctional Service’s Offender Management System (OMS) and, later on, the Offender Tracking Information System (OTIS). A detailed coding manual was constructed and used to objectively define background, pre- and post- variables for each offender.

The second phase of the data collection involved using client identification numbers to locate the offender file on the Offender Management System (OMS/OTIS) in order to verify client information and accuracy. The OMS system, replaced by OTIS system in July 2001, was

accessed with the assistance of the Ministry staff, in order to collect post-release data on each offender. The Regional Ontario Provincial Police Headquarters, North Bay, provided official offender record sheets from the Royal Canadian Mounted Police's Canadian Police Intelligence Computer (C-PIC) for each offender in the sample. These offender record sheets were delivered to the researcher and the information on both prior offences (criminal history) and recidivism information (post-release offences) in the data were gathered through official criminal record sheets from these two databases. The OMS/OTIS data files were used to verify follow-up data from the C-PIC offender record sheets. If there were any inconsistencies, the most current information provided by OTIS was obtained.

All information collected for the purpose of the study was kept confidential. Once record sheets were retrieved, the names of the offenders were replaced with appropriate numeric identifiers. Three types of variable sets were obtained from the LSI-OR, OMS-OTIS and C-PIC data bases: a client descriptive variable set which includes demographics and legal items, a risk/need assessment variable data set, and an outcome (recidivism) data set.

The third phase of the procedure involved coding and transferring the data sets into an SPSS data file for statistical analyses, aimed at testing the proposed hypotheses. The master list was destroyed once all the data were collected and numeric codes were assigned. At the end of the study, all LSI-OR's were returned to the Ministry's office. In this phase, all the statistical analyses were performed and recorded. Recording and interpreting the results of statistical analyses were the main tasks of this phase. Two special offender groups were identified from the data set based on Location (custody-community), and whether they were violent or nonviolent offenders at their Index Offence.

Design and Analyses

The current study employed a longitudinal design and three types of variables: client descriptive variables and risk assessment variables, both of which were documented as part of the offender intake process, and recidivism outcome variables, which were collected some time thereafter.

Initially, several reliability analyses were performed in order to test the reliability of the LSI-OR instrument. The instruments' internal consistency estimate (Cronbach's alpha) was obtained for each section total and for their corresponding subscales. Inter-correlations between the sections and subscales were performed. The LSI-OR instrument's reliability evaluation included examination of its temporal stability and inter-rater consistency simultaneously, resulting in a 'hybrid' (not standard) combined reliability estimate on collapsed (custody and community) samples.

The second section of analyses generated young offender norms for the LSI-OR and examined its psychometric properties. In order to obtain norms, descriptive statistics were generated for the whole sample, for community and institutional (custody) groups, and for mean LSI-OR subscale and total section scores, strengths, and other variables. These included various legal and demographic variables as they pertained to these groups. The differences between institutional and community offenders were examined. These analyses established base rates for the index offence by institutional and community groups. Subsequently, these two groups were compared on their scores on all risk/need factors (general and specific), and other subscales of the LSI-OR. Frequencies were obtained for the initial and final risk levels.

All the offenders were grouped into initial risk level categories based on the offender's General risk/need factor total score prior to the use of the 'override.' The initial and final risk

level categories were analyzed, including the process of the 'override,' and final risk level categories were not relied upon in deriving the LSI-OR's risk levels (subject to final analyses and conclusions) since the final risk category did not improve LSI-OR's correlations with recidivism variables. In reviewing frequencies for the initial and final risk levels, percentages of the override were examined. The use of the override across different risk categories and direction in which it was used (to increase or decrease risk level) were evaluated. The initial risk level constituted the base for the LSI-OR's risk levels in predictive analyses.

In order to further an examination of the LSI-OR instrument's psychometric properties on the sample of young offenders, an exploratory factor analysis was performed on the General risk/need factor (Section A) of the LSI-OR, which comprises 43 items. This was done in order to evaluate the LSI-OR instrument's construct validity, by inspecting whether the data reduced to factors that correspond to the 8 subscales of the General risk/need factor or some other meaningful combination. Any factor with an eigenvalue of less than 1.0 was removed as per Kaiser-Guttman criterion and a scree plot was used to determine the optimal number of factors (Norman & Streiner, 1999). Extracted factors were rotated to an oblique solution, using the stringent criteria for optimal factor composition: (1) primary loadings of .42 or greater, based on the formula for significance of factor loadings: the loadings being greater than $5.152/\sqrt{(N-2)}$ (Norman & Strainer, 1999, p.146); (2) more than three items per factor; and (3) clear interpretability of items (Clough, 2002; Darlington, 2002). A factor-loading matrix was analyzed, showing how much each variable correlated with, or loaded on, each factor.

The third section of the analyses focused on offender recidivism. Descriptive recidivism data were obtained for general, violent and nonviolent recidivism on the total sample and the custody and community subgroups. The description of recidivism included comparisons of the

custody and community groups' odds of recidivating rather than not recidivating, for the three types of recidivism (general, violent and nonviolent). The definition of (general) recidivism was based on any (yes-no) convictions, and violence included violent offences that did not necessarily involve contact with the person (e.g., uttering threats, arson, weapon related). Such a broad definition of violence was applied to a population with an increased frequency of violent behaviour (although base rates for violent re-offending in the current study were 20.1% as compared to above 41% in Girard's (1999), YO sample, they were still much higher than in the general population). A final portion of the recidivism descriptive section included a comparison of survival rates for the total, custody and community samples. Survival analyses, which were conducted using the Kaplan-Meier (K-M) approach (Norman & Streiner, 1999), added a time dimension to the already reported recidivism rates for the total sample and for its two, custody and community, subgroups.

The fourth section of the analyses included the bivariate correlations between LSI-OR subscales, sections and various recidivism variables. The LSI-OR item correlations with general, violent and nonviolent recidivism were examined. A series of 2x4 chi-square analyses was applied to determine whether risk level categories differentiated between recidivists and nonrecidivists in the two offender groups. The differences between community and institutional offender groups were examined in terms of recidivism percentages for each of the LSI-OR four risk levels (high and very high risk groups were combined due to reduced *n*). Finally, a series of 2 x 2 chi-square analyses were completed, in order to compare the recidivism rates associated with the risk levels to one another.

A number of other procedures were performed as a part of the fourth section of the analyses. The modern Signal Detection Theory's (SDT) accuracy index (the ROC method) was

utilized, as nonparametric procedures are now available for estimating the Area Under the Curve (*AUC*) statistic. Such ROC analyses were completed for the two subgroups of interest. The effect sizes were presented for the LSI-OR's Section A, the two derived (Static and Dynamic) factors, Initial and Final risk (4 levels), Sections B, C, F, G, and the Strengths variable on general, violent and nonviolent recidivism.

Other analyses included a series of survival analyses. They were conducted using the Kaplan-Meier (K-M) approach (Norman & Streiner, 1999). Survival techniques were used in order to model the timing of qualitative change, in this case from nonrecidivism to recidivism status, using the specific period of a follow-up time. All the required assumptions for an identifiable starting and a clearly defined end point were met (Norman & Streiner, 1999). The starting point for institutional offenders was the day of their release to the community, while the day of LSI-OR administration served as the starting date for the community offenders. The ending point for all recidivists was the date of reconviction (provincial order start date). For nonrecivists, it ended on a common date (December, 2001) when the CPIC records were obtained and examined for post-assessment (follow-up) criminal activity. The purpose of these survival analyses was to examine the rate and speed of reoffending, and to compare the resulting survival curves of young offenders who were assigned to different LSI-OR risk categories. Survival analyses were completed on the entire sample, by risk level.

A graphic review of group membership (i.e., the LSI-OR instrument's risk groups and violent-nonviolent recidivism groups) and their survival rates were generated. At this point the mean survival time of the very low, low, medium and (combined) high/very high-risk groups, for general, violent and nonviolent recidivists became known, as did the relationships between the group memberships, risk level and survival time. The use of two separate methods (confidence

interval analysis and Breslow statistic) allowed for a thorough examination of survival curves, (representing respective risk levels), with each other.

In this section, hierarchical multiple regression analyses were conducted to assess the capacity of the LSI-OR variables to predict a variety of recidivism variables, including general, violent, nonviolent binary recidivism and the number of violent and nonviolent charges, a continuous outcome variable. The statistical regressions were used to develop a subset of independent variables, which would be useful in predicting the dependent variable (recidivism) and to eliminate those independent variables that do not provide additional predictive validity (Pedhazur, 1997; Tabachnik & Fidell, 1996).

Multiple regression analyses were performed on the total sample of Caucasian male young offenders ($N = 154$), controlling for the effects of Location (force-entered first). The location variable (custody-community) has been shown in the literature to be associated with differential recidivism rates, speed and patterns. As such, it is important to establish whether the LSI-OR instrument, which predicts recidivism for a variety of offender populations, also demonstrates sufficient predictive power for the young offender population, after the location variable has been controlled for.

By utilizing the hierarchical (sequence of blocks) logistic regression analyses in prediction of the binary (yes-no) recidivism variables, it was determined whether LSI-OR Sections A, B, C, F, and G offered any incremental predictive validity after having force-entered Location (custody-community). The next question was whether the added LSI-OR Sections B, C, F, and G were able to predict the likelihood of an offender's general, violent and nonviolent recidivism, controlling for Location and Section A. It is of theoretical and practical interest to see whether the revised LSI-OR, in particular its newly added sections B, C, F, and G, actually add

an incremental predictive validity to the Location and Section A's (total score) variables. The order of predictor block entry was pre-determined by the researcher, based on the existing research on the LSI-OR instrument (Andrews & Bonta, 1998) and, based on how the total score was initially derived and how it was later revised. By using the ROC method with its *c* statistic (*AUC* value), the diagnostic value of the logistic regression models was assessed.

The regression analyses also included multiple regression models with Blockwise and Stepwise selection methods, in prediction of the Number of charges (total, violent and nonviolent), which are continuous recidivism variables. As before, these analyses were performed on the total young offender sample ($N = 154$) and Location (custody-community) was force-entered first, in order to control for its effects on recidivism. Subsequent to that, the LSI-OR (predictor) variables were grouped into 2 Blocks and force-entered in a pre-established order, based on the current theoretical knowledge regarding the best predictors of recidivism (Andrews & Bonta, 1997; Hoge, Andrews, & Leschied, 1994; Simourd & Andrews, 1994). The 'Big Four' recidivism predictors were force-entered first and this way they were controlled for before the Stepwise method was applied to perform the remaining predictor variables' selection (based solely on mathematical principles). The latter procedure allowed for exploration of other than the 'Big Four' Section A's subscales, for their unique effects on recidivism. This way the best predictors of recidivism for the current sample of young Caucasian male offenders from Northern Ontario were established.

Results

Foreword

The results of this study are presented in four sections. The first section provides a number of descriptive statistics about the participants. Comparisons are broken down by location of the offender during the administration of the LSI-OR instrument and participants from the custody and community groups are compared on their age, education level, mental-health problems/suicide, most severe index offence, violent and nonviolent index offending, sentence length and, finally, on the offender release mode. An alpha level of .05 was used for all statistical tests.

The second section describes the psychometric properties of the LSI-OR and includes norms and analysis of the override. The third section focuses on offender recidivism. It includes a number of descriptive variables regarding the offender follow-up, recidivism rates, the odds of recidivating versus not recidivating, and Survival analyses, showing the overall rate of survival of the total sample and assessing group differences in survival time for custody and community participants. This is in keeping with the general, violent and nonviolent recidivism constructs for the whole sample and the subgroups of interest.

The fourth section involves a series of predictive analyses between the LSI-OR and recidivism. The ability of the LSI-OR risk/need categories to differentiate between recidivists and nonrecidivists was examined (chi-square analyses). This was followed by a review of a number of bivariate correlations between predictor (LSI-OR) and outcome (recidivism) variables. Estimates of the LSI-OR instrument's predictive power were obtained by utilizing ROC analyses and Survival Analyses. Subsequent to that, multiple regression analyses were conducted, using both Hierarchical Logistic and Blockwise/Stepwise multiple regression

methods, in order to assess the incremental predictive validity of the LSI-OR instrument's Sections and Section A's subscales, in blocks of variables, and individually (Stepwise), after Location's (custody-community) impact on recidivism has been accounted for.

Hierarchical multiple regression procedures permitted the establishment of whether the LSI-OR variables and, actually, which specific ones, or their combinations, make a unique contribution to the prediction of recidivism variables for the young offenders of this current sample. In particular, exploratory statistical methods (Stepwise selection) were utilized to select the most significant predictors of recidivism for this unique sample. The predictors selected mathematically were those that were above and beyond the "Big Four" major predictors, which were entered first, because they were already theoretically established (Andrews & Bonta, 1997). Therefore, caution should be exercised when the results of statistical selection amongst other than the "Big Four" predictors are generalized to all young offenders. Recidivism variables included the binary general, violent and nonviolent outcome measures, and total number of charges quantitative (continuous) recidivism measure.

Offender Descriptives

In this section offenders are compared on age, last grade completed, presence or absence of acute mental-health problems/suicidal ideations or attempts, most severe index offence, violent and nonviolent index offending, sentence length and, finally, on their release mode to the community. It includes comparisons based on location (custody-community).

The sample consisted of 154 Caucasian male young offenders from Northern Ontario. Aboriginal and female young offenders had also been a part of the initial cohort of 240 but were removed from the sample due to their reduced numbers and because there was evidence that they

contributed in a unique fashion. Those who were removed were 42 aboriginal and 53 female young offenders, some of whom were also of female gender and native ethnic background.

The remaining sample of 154 was broken down by location, showing that the custody sample consisted of 57 (37%) participants while the community sample consisted of 97 (63%) youth.

Age. At the time of LSI-OR administration, the average age for the total young offender (YO) sample was 17.46 ($SD = .75$) years, with a range of 16.1 to 20.0 years. In order to compare the subjects' mean age between two locations (custody, community), t test was performed. The custody offenders' mean age ($M = 17.36$, $SD = .64$) was not significantly different from that of the community participants ($M = 17.52$, $SD = .80$), $t(152) = 1.309$, $p = .192$. Custody offenders' age range was from 16.3 to 18.7 years and community offenders' age range was from 16.1 to 20.0 years. These results suggest that age cannot account for any differences between groups in other analyses.

Last grade completed. The average level of formal education was measured by the 'last grade completed' by 142 (92%) young offenders, on whom such data were available. For the last grade completed, the average was 9.96 ($SD = 1.29$) with the grade range from 1 to 12. The custody's grade range was 1 to 12, while community's grade range was 7 to 12. In order to compare custody and community locations on their average last grade completed, t test was performed (unequal variances). The custody offenders' mean last grade completed ($M = 9.72$, $SD = 1.65$) was not significantly different than that of the community participants ($M = 10.10$, $SD = 1.01$), $t(75.790) = -1.536$, $p = .129$. These results suggest that formal education cannot account for any differences between groups in other analyses.

Mental health problems/suicide. The presence or absence of acute mental-health problems/suicidal ideations was established in 152 (98.8%) young offenders on whom such binary data were available. These data indicated that 39 (25.7%) young offenders presented with acute mental-health/suicide needs, whereas 113 (74.3%) youth apparently did not have such needs. In comparing two locations (custody, community) on the proportion of those who had mental-health/suicide problems with those who did not have them, a 2x2 Chi-square analysis was completed. As a result, it was found that those with mental health/suicide problems and those who did not have these needs, were distributed in a similar fashion within the custody and community groups, $\chi^2(1, 152) = .808, p = .849$. The proportions of those affected to those not affected by mental health/suicide needs were as follows: in custody, 15 (16.8%) to 41 (73.2%) youth and, in community, 24 (25.0%) to 72 (75.0%) youth. Judging by the discussed distribution, both groups of young male offenders did not differ on their rates of acute mental health/suicide problems and, thus, these types of problems would not account for any differences between groups in other analyses.

Index offence severity (IOS). For the IOS, offences were coded according to the Ministry's 26-point offence severity categories (MCS Manual, 1997), eight of which included violent offences (Appendix C). On their most severe offence, the custody ($M = 18.34, SD = 3.93$) and community offenders ($M = 18.54, SD = 3.93$) did not significantly differ, $t(152) = 1.309, p = .192$.

Violent vs. nonviolent index offending. The custody and community groups were compared on their most severe violent and nonviolent index offences and on number of convictions, including number of violent and nonviolent convictions.

For violent offences, youth in custody and community did not differ from one another. Three variables represented degrees of violent index involvement, an extreme violence, violence and no violence, and did not differentiate between custody and community groups $\chi^2(2, 154) = .609, p = .737$. Extreme violence included the Ministry's most severe offence categories number 1 to 3 (homicide, serious violent, violent sexual). Other violence included the Ministry's most severe offence categories 5, 7, 9, 11, and 12 (nonviolent sexual, weapons, mischief against the person, assault related, arson/property damage).

The number of extremely violent offenders was very low for both custody and community groups (1.8 % vs. 3.1 %, respectively), indicating that a basic violence-nonviolence dichotomy will be more useful in future analyses, due to very low baserates of extreme violence (2.6% for the total sample).

Table 1 shows the baserates of violent and nonviolent offending throughout the custody and community samples. It can be seen that the baserate of violence for the total sample was 22.1%, with 28.1 % of violent convictions in the custody and 18.6 % in the community groups. Chi-square analysis confirmed that the ratios of nonviolent and violent offending in custody and community groups were not significantly different, $\chi^2(1, 154) = 1.889, p = .169$.

In summary, the custody and community groups did not significantly differ on their violent index offending, including their mean number of violent convictions ($M = .40, SD = .84$ vs. $M = .22, SD = .50$, respectively), $t(89.051) = 1.523, p = .132$. However, as for the number of nonviolent convictions, the custody group ($M = 2.96, SD = 2.22$) had significantly higher mean number of these in comparison to the community group ($M = 1.91, SD = 3.19$), $t(152), p = .029$. Finally, regarding the total number of (violent and nonviolent combined) index convictions, the custody offenders ($M = 3.37, SD = 2.22$) had a significantly higher number than did their community

counterparts ($M = 2.12$, $SD = 3.17$), $t(152) = 2.609$, $p = .010$. Therefore, the difference between custody and community participants was traced to the number of nonviolent offences and to the number of any (total) offences, which were both significantly higher in the custody group, while violent offences were relatively low (22.1%) and did not deviate between these groups.

Table 1

Base rates of Violent and Nonviolent Index Offending by Location and for the Total Sample

	Custody ($n = 57$)	Community ($n = 97$)	Total ($N = 154$)
Offence Type	n (%)		
Nonviolent	55 (96.5)	86 (88.7)	141 (91.6)
Violent *	16 (28.1)	18 (18.6)	34 (22.1)

Note. There is an overlap between violent and nonviolent categories. * refers to violent offences as per the Ministry's 26 offence categories (Appendix C).

Sentence length. Comparisons between the custody and community offenders on their sentence length were made specifically in order to contrast the supervision time, which these two types of offenders received. Young offenders in custody ($M = 133.82$, $SD = 99.6$) received significantly shorter sentence lengths than community offenders ($M = 408.09$, $SD = 142.5$), $t(147.372) = -14.013$, $p < .001$.

Such comparisons illustrate that the custody offenders, including those with open custody to follow secure (OCFS) and those with probation to follow incarceration (PFI), were under significantly shorter total supervision time than were their community counterparts. There was

also a significant difference between open ($M = 187.47$, $SD = 135.29$) and secure custody ($M = 107.00$, $SD = 62.29$) offenders on supervision time, with the secure custody offenders receiving significantly less supervision (i.e., a total sentence length), $t(21.898) = 2.465$, $p = .022$.

Offender release mode. Out of 57 custody offenders, 19 (33.3%) were sentenced to open custody and 38 (66.7%) were sentenced to secure custody, 2 times as many offenders being in secure than in open custody. The community group ($n = 97$) consisted of 84 offenders with a sole probation sentence (86.6%) and 13 offenders with a previous incarceration term (13.4%). Interestingly, 40.4% of the current custody sample ($n = 23$) will have a community portion of their sentence to follow their incarceration, either through straight probation to follow incarceration (PFI) or gradual release to open custody following secure custody (OCFS). This elucidates an independent character of the current custody and community samples in relation to the disposition they received (i.e., supervision time and release mode).

Table 2 presents the two (secure and open) custody samples based on their location at LSI-OR testing time and reveals the various release modes for these custody offenders. Thirteen out of 19 open custody offenders as well as 23 out of 38 offenders from secure custody (64.5% of 57 total custody subjects), will have a community portion of their sentence to follow incarceration, indicating a gradual release mode being utilized with more than half young offenders placed in custody. Thirteen (34.2%) secure custody offenders and 6 (31.6%) open custody offenders will be released directly to the community (33.3% of total custody sample). In addition, two secure custody offenders (5.3%) will have an open custody sentence following secure custody, without the probation term to follow. This is in contrast to 64.5% custody offenders, with whom a slower but steady (gradual) community re-adaptation strategy will be utilized.

Table 2

Custody Location at Testing and Offender Release Mode

	Open Custody	Secure Custody	Total Custody
Release Type	<i>n</i> (%)		
PFI ¹	13 (68.4)	19 (50.0)	32 (56.1)
OCFS and PFI	0 (0.0)	4 (10.5)	4 (7.0)
OCFS ²	0 (0.0)	2 (5.3)	2 (3.6)
Straight Release	6 (31.6)	13 (34.2)	19 (33.3)
Total	19 (100.0)	38 (100.0)	57 (100.0)

Note. ¹ probation following incarceration. ² open custody following secure custody.

Psychometric Properties of the LSI-OR Instrument

In examining the psychometric properties of the LSI-OR, the first set of analyses generated norms for the total sample of young offenders and for their custody and community groups. This was followed by analysis of the override. Reliability measures were obtained, which included internal consistency, inter-item reliability, and a 'hybrid,' combined estimate of inter-rater consistency and temporal stability. Finally, a factor analysis on the General risk/need factor section was performed, providing construct validity estimation.

Offender norms. The first analyses performed provided preliminary normative data for the total sample (Table 3) for each of the LSI-OR risk/need factor's total and subscale scores,

Specific risk/need factor's total and subscale scores, total Strengths, Institutional factors, Other Client issues, as well as Responsivity factors.

Table 3

Mean LSI-OR Subscale and Total Section Scores for the Total Sample (N = 154)

Subscales & section totals	<i>M</i>	<i>SD</i>
General risk/need factors	14.47	7.91
Criminal history	2.94	2.75
Education/employment	3.58	2.28
Family/marital	1.02	0.87
Leisure/recreation	1.29	0.81
Companions	1.66	0.88
Procriminal attitudes	0.71	1.02
Substance abuse	2.21	2.14
Antisocial patterns	1.08	1.09
Specific risk/need factors	2.32	2.00
Personal problems [†]	1.82	1.59
History ^{††}	0.50	0.81
Strengths	0.74	1.58
Institutional factors	0.04	0.28

Table 3 (continued)

Mean LSI-OR Subscale and Total Section Scores for the Total Sample (N = 154).

Subscales & section totals	<i>M</i>	<i>SD</i>
Other client issues	1.62	1.75
Responsivity factors	0.67	0.82

Note. † refers to Specific risk/ need factors with criminogenic potential. †† refers to Specific risk/need factor subscale, History of perpetration.

Table 4 reveals normative data for custody and community young male offenders, on the same LSI-OR Sections' totals and Subscales' scores. Initial custody and community comparisons revealed that institutional offenders scored significantly higher on the majority (14 out of 15) of variables, with the exception of Strengths total. This was prior to the more stringent significance (Bonferroni) criteria being applied. When standard t-tests were evaluated against modified Bonferroni *t* tables for 15 comparisons (Howell, 1992, $p = .05/15 = .003$; *critical value* = 2.94), the following additional variables no longer differentiated between custody and community offenders: Education/employment, Family/marital, Leisure/recreation, and Companions' Section A subscales, as well as Sections F, Other client issues, and Section G, Responsivity considerations.

Consequently, significant differences between the custody and community offenders were established to be due to the LSI-OR Section A total and its four subscales, Criminal history, Procriminal attitudes, Substance abuse, and Antisocial pattern, in addition to Section B total and its two subscales, Personal problems with criminogenic potential and History of perpetration.

Table 4

Custody-Community Comparisons on LSI-OR Section Totals and Subscales

Subscales & section totals	Custody		Community		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
General risk/need factor total	19.72	6.34	11.39	7.09	-7.312 ^{***}	152
Criminal history	5.02	2.38	1.72	2.16	-8.795 ^{***}	152
Education/employment	4.16	2.09	3.24	2.34	-2.456 [*]	152 ^{†††}
Family/marital	1.26	0.79	0.88	0.88	-2.730 ^{**}	238 ^{†††}
Leisure/recreation	1.46	0.7	1.19	0.82	-2.032 ^{**}	152 ^{†††}
Companions	1.93	0.88	1.51	0.84	-2.929 ^{**}	13.078 ^{†††}
Procriminal attitudes	1.05	1.16	0.51	0.88	-3.312 ^{***}	152
Substance abuse	3.21	1.97	1.62	2.02	-4.760 ^{***}	152
Antisocial patterns	1.65	1.06	0.74	0.97	-5.406 ^{***}	152
Specific risk/need factor total	3.25	1.90	1.78	1.87	-4.661 ^{***}	152
Personal problems [†]	2.47	1.50	1.44	1.53	-4.068 ^{***}	152
History of ^{††}	0.77	0.93	0.34	0.69	-3.055 ^{**}	92.784
Strengths total	0.95	2.17	0.62	1.09	-1.065	72.951 ^{†††}

Table 4 (continued)

Custody-Community Comparisons on LSI-OR Section Totals and Subscales

Subscales & section totals	Custody		Community		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Other client issues total	2.04	1.68	1.37	1.76	-2.301 [*]	152 ^{†††}
Responsivity considerations total	0.89	0.88	0.54	0.75	-2.683 ^{**}	152 ^{†††}

Note. [†] refers to Specific risk/need factors, Personal problems with criminogenic potential. ^{††} refers to Specific risk/need factor subscale, History of perpetration. ^{†††} Bonferroni's correction = not significant. ^{*} $p < .05$; ^{**} $p < .01$; ^{***} $p < .001$.

Override. LSI-OR scores were grouped into 5 risk levels based on a priori established cutoffs, producing the initial risk levels. LSI-OR assessment also utilized professional discretion or 'override', used to derive the final risk categories. Frequencies were obtained for the total, custody and community samples for the initial (Table 5) and final (Table 6) LSI-OR's risk levels.

From reviewing the numbers and percentages across the initial and final risk groups, it can be seen that a low percentage of offenders was found in the two extreme risk categories (14.9% and 12.3% for initial and final risk levels, respectively). As expected, custody offenders were assigned to higher risk categories compared to the community offenders. Initially (initial risk level), there were no custody offenders in the very low risk category. After the clinical 'override' was used (final risk level), there was one offender placed in the very low risk category, whose risk changed from low to very low. Regarding the very high-risk level, it initially comprised four offenders (2.6%), but one of them descended to the high risk category

(due to the use of ‘override’) and there were only three very high risk offenders (1.9%) in the final version of the LSI-OR risk levels. Therefore, due to such small n , all subsequent analyses based on risk levels (initial and final) have collapsed the high and very high-risk groups.

Table 5

Initial Risk Level Frequencies for the Total Sample, Custody and Community Groups

	Custody	Community	Total
Risk Level (score)	n (%)		
VL (0 - 4)	0 (0.0)	19 (19.6)	19 (12.3)
L (5 - 10)	5 (8.8)	33 (34.0)	38 (24.7)
M (11 - 19)	21 (36.8)	31 (32.0)	52 (33.8)
H (20 - 29)	29 (50.9)	12 (12.4)	41 (26.6)
VH (30+)	2 (3.5)	2 (2.0)	4 (2.6)
Total	57 (100.0)	97 (100.0)	154 (100.0)

Note. VL = very low; L = low; M = medium; H = high; VH = very high.

Table 6

Final Risk Level Frequencies for the Total Sample, Custody and Community Groups

	Custody	Community	Total
Risk Level (score)	<i>n %</i>		
VL (0 - 4)	1 (1.8)	15 (15.5)	16 (10.4)
L (5 - 10)	3 (5.3)	25 (25.8)	28 (18.2)
M (11 - 19)	19 (33.3)	40 (41.2)	59 (38.3)
H (20 - 29)	33 (57.8)	15 (15.5)	48 (31.2)
VH (30+)	1 (1.8)	2 (2.0)	3 (1.9)
Total	57 (100.0)	97 (100.0)	154 (100.0)

Note. VL = very low; L = low; M = medium; H = high; VH = very high.

Table 7 presents the (4x4) relationship between the initial and final LSI-OR risk levels for the total sample ($N = 154$) of young offenders. The 'override' utilization pattern can be clearly seen from the (below- and above- diagonal) offender distribution across the categories of risk. The chi-square analysis indicated that there is an association between the initial and final risk categories, as the hypothesis that the initial and final risk patterns were significantly different was rejected ($\chi^2 = 318.939$, $df = 9$, $p < .001$). Table 7 reveals that, for the total sample, the 'override' was used in 13.6% of the cases, and the professional discretion principle was not utilized in 86.4% of the cases of young offenders, when they were assessed with the Level of Service Inventory-Ontario Revised.

Table 7 reflects specific changes made from the initial to final risk levels, for the total sample of young offenders. There were nineteen offenders in total (12.3%) who were moved to the higher risk category based on the professional discretion principle ('override'). Specifically, in the initially very low risk category, three offenders (15.8%) were shifted to the final medium risk category (2 levels higher in risk) and one offender (5.3%) was re-positioned to the high/very high category (3 risk levels elevation due to sexual offending). The greatest increase in risk level occurred in the low risk category, where the final risk level indicated that low initial scores were heightened by one level (to medium) in nine cases (23.7%). Further, six offenders (11.5%) were moved from medium to the high/very high category of risk, following the use of the override.

From following the override in the opposite direction, higher to lower risk levels, there were two offenders whose risk was lowered by one level, including one from the low to very low (2.6%) and one from the high/very high to medium (2.2%) risk levels.

In summary, it can be seen from Table 7 that, for the total sample of young offenders, the override carried upward ($N = 19$) was considerably more than the override carried downward ($N = 2$), with no override across diagonal representing the remainder (86.4%).

Table 7

The Initial by Final Risk Level for the Total Sample of Young Offenders

Final Risk Level (score)	LSI-OR Initial Risk <i>n</i> (%)				Total
	VL	L	M	H/VH	
VL (0 - 4)	15 (78.9)	1 (2.6)	0 (0.0)	0 (0.0)	16 (10.4)
L (5 - 10)	0 (0.0)	28 (73.7)	0 (0.0)	0 (0.0)	28 (18.2)
M (11 - 19)	3 (15.8)	9 (23.7)	46 (88.5)	1 (2.2)	59 (38.3)
H/VH (20 - 29)	1 (5.3)	0 (0.0)	6 (11.5)	44 (97.8)	51 (33.1)
Total	19 (12.3)	38 (24.7)	52 (33.8)	45 (29.2)	154 (100.0)

Note. V = very low; L = low; M = medium, H/VH = high & very high

Table 8 reflects specific changes made from the initial to final risk levels for the young offenders in custody. There were five offenders in total (8.8%) who were moved to the higher risk category based on the professional discretion principle ('override'). There were no custody offenders assigned to the very low risk category. In the initial low risk category, one offender (20.0%) was shifted to the final medium risk category (1 level higher in risk). The greatest increase in risk level occurred in the medium risk category, where the final risk level indicated that medium initial scores were heightened by one level, from medium to high/very high risk, in four cases (19.0%), following use of the override.

From following the override in the opposite direction, higher to lower risk levels, there was a total of two offenders (3.5%) whose risk was lowered by one level, including one from the low to very low (20.0%) and one from the high/very high to medium (3.2%) risk levels.

In summary, it can be seen from Table 8 that, in the custody group, the override carried upward ($N = 5$) was somewhat higher than the override carried downward ($N = 2$), with no override across diagonal representing the remainder (87.7%). The downward override percentage is slightly underestimated due to the merge of high and very high risk levels, which concealed one 'override' that had been used downward, from the very high to high risk level, when these risks were separated.

The chi-square analysis indicated that there is an association between the initial and final risk categories, as the hypothesis that the initial and final risk patterns were significantly different was rejected ($\chi^2 = 80.532$, $df = 6$, $p < .001$).

Table 8

The Initial by Final Risk-Level for the Custody Group of Young Offenders

Final Risk Level (score)	LSI-OR Initial Risk <i>n</i> (%)				Total
	VL	L	M	H/VH	
VL (0 - 4)		1 (20.0)	0 (0.0)	0 (0.0)	1 (1.8)
L (5 - 10)		3 (60.0)	0 (0.0)	0 (0.0)	3 (5.3)
M (11 - 19)		1 (20.0)	17 (81.0)	1 (3.2)	19 (33.3)
H/VH (20 - 29)		0 (0.0)	4 (19.0)	30 (96.8)	34 (59.6)
Total		5 (8.8)	21 (36.8)	31 (54.4)	57 (100.0)

Note. V = very low; L = low; M = medium, H/VH = high & very high

Table 9 reflects specific changes made from the initial to final risk levels for young offenders in the community sample. There were fourteen offenders in total (14.4%) who were moved to the higher risk category based on the professional discretion principle ('override'). In the initial very low risk category, three offenders (15.8%) were shifted to the final medium risk category (2 levels higher in risk) and one offender was elevated to the high/very high risk level (3 levels upward), constituting the furthestmost elevation in risk. The greatest increase in risk level, in terms of frequency, occurred in the low risk category, where the final risk level indicated that low initial scores were heightened to medium level in eight cases (24.2%), following use of the override. There were also two offenders who were moved from the medium to high/very high-risk level (6.5%).

From following the override in the opposite direction, higher to lower risk levels, there was no 'override' utilized downward in the community sample. In summary, it can be seen from Table 9 that, in the community group, the override was carried upward ($N = 14$), to higher risk levels, with no override across diagonal representing the remainder (85.6%). Of note, the lack of downward override is misrepresented due to the merge of high and very high-risk levels, which concealed one 'override' that had been used downward, from the very high to high-risk level, when these risks were separated.

The chi-square analysis indicated that there is an association between the initial and final risk categories, as the hypothesis that the initial and final risk patterns were significantly different was rejected ($\chi^2 = 205.622$, $df = 9$, $p < .001$).

Table 9

The Initial by Final Risk-Level for the Community Group of Young Offenders

Final Risk Level (score)	LSI-OR Initial Risk <i>n</i> (%)				Total
	VL	L	M	H/VH	
VL (0 - 4)	15 (78.9)	0 (0.0)	0 (0.0)	0 (0.0)	15 (15.5)
L (5 - 10)	0 (0.0)	25 (75.8)	0 (0.0)	0 (0.0)	25 (25.8)
M (11 - 19)	3 (15.8)	8 (24.2)	29 (93.5)	0 (0.0)	40 (41.2)
H/VH (20 - 29)	1 (5.3)	0 (0.0)	2 (6.5)	14 (100.0)	17 (17.5)
Total	19 (19.6)	33 (34.0)	31 (32.0)	14 (14.4)	97 (100.0)

Note. V = very low; L = low; M = medium, H/VH = high & very high

In Table 10, the association of the risk level categories with the General risk/need factors and total section scores was examined for the total YO sample. The correlations decreased from the initial to the final risk level on the General risk/need factors' total ($r = .94$ to $r = .84$). The correlation coefficient between the initial and final risk level was .88, $p < .001$, reflecting that there was only little change from initial to final risk and that the change, due to utilization of the professional discretion principle, diminished the final risk levels' correlation with the LSI-OR instrument.

Table 10

Total Sample (N=154): Spearman Correlations between Initial Risk Levels, Final Risk Levels, and General Risk/Need Factors' Subscales and Total

LSI-OR Scale or Subscales	Initial Risk level	Final Risk level
	(1 - 4)	
General risk/need factors (total)	.94	.84
Criminal history	.71	.65
Education/employment	.62	.56
Family/marital	.44	.40
Leisure/recreation	.57	.48
Companions	.46	.35
Proc. Attitude/orientation	.56	.47
Substance abuse	.67	.62
Antisocial patterns	.75	.67

Note. All correlation coefficients significant at .001. Initial and Final 4-level risk schedule, $r = .88, p < .001$.

Table 11 presents association between the initial and final risk level categories with the General risk/need factors and total section scores, for custody and community young offenders. For custody offenders, Spearman correlations between their initial and final risk levels and

General risk/need factors decreased for most of the risk/need factors, with the exception of the Criminal history and Companions' subscales. Improved correlation between Criminal history and Companions subscales with final risk, as compared to initial risk, may indicate that the clinical 'override' successfully tapped into this category of offenders' needs, influencing risk-level adjustment in the right direction. However, there was a substantial decrease in the magnitude of all other LSI-OR subscales' associations with the LSI-OR final risk, as compared to initial risk, including some associations that had initially been robust and significant, and became smaller and insignificant upon 'override' (i.e., Family/marital, Leisure/recreation, Procriminal attitude/orientation). The average Spearman correlation coefficient between the initial and final risk level for the custody group was $.855, p < .001$, reflecting a change from the initial to final risk levels.

As for the community group, there were no increased correlations from the initial to final risk levels. Instead, all correlations substantially decreased. In contrast to what seemed like the case of a successful 'override' in the custody group, for Criminal history and Companions, the particular Companions subscale deteriorated and became not significant when 'override' was applied to the community offenders. This shows that the newly added clinical information and the (final) risk adjustment do not correlate with one another when it comes to the Companions Section A's subscale. The average correlation coefficient between the initial and final risk levels for the community group was $.835, p < .001$, reflecting a negative change from the initial to final risk levels.

Table 11

Custody (N=57) and Community (N=97) Samples: Spearman Correlations between Initial Risk Levels, Final Risk Levels and General Risk/Need Factors' Subscales and Total

LSI-OR Scale or Subscales	Custody		Community	
	Initial Risk	Final Risk	Initial Risk	Final Risk
General risk/need factors (total)	.91 ^{***}	.79 ^{***}	.96 ^{***}	.80 ^{***}
Criminal history	.56 ^{***}	.66 ^{**}	.64 ^{***}	.50 ^{***}
Education/employment	.48 ^{***}	.42 ^{**}	.71 ^{***}	.62 ^{***}
Family/marital	.43 ^{**}	.25	.38 ^{***}	.37 ^{***}
Leisure/recreation	.36 ^{**}	.16	.65 ^{***}	.54 ^{***}
Companions	.48 ^{***}	.51 ^{***}	.38 ^{***}	.18
Proc. attitude/orientation	.39 ^{**}	.22	.66 ^{***}	.59 ^{***}
Substance abuse	.59 ^{***}	.54 ^{***}	.64 ^{***}	.57 ^{***}
Antisocial patterns	.66 ^{***}	.49 ^{***}	.74 ^{***}	.67 ^{***}

Note. Custody group: Initial and Final 4-level risk schedule, $r = .86, p < .001$. Community group: Initial and Final 4-level risk schedule, $r = .84, p < .001$. * $p < .05$. ** $p < .01$. *** $p < .001$.

As seen in Table 11, the LSI-OR Section A's subscales, Criminal history and Companions, improved their correlations with the LSI-OR final risk, as compared to initial risk, showing some gains from use of the 'override' ($r = .56$ to $.66$ and $r = .48$ to $.51$, for initial and final risk, for Criminal history and Companions, respectively). However, all other Section A's subscales and its total, did not benefit from use of the 'override' option, as reflected in their

decreased correlations between Section A variables and final risk level in comparison to initial risk level. Although use of the clinical ‘override’ intended to improve classification of offenders who were either in custody or community, it did not accomplish that objective for either of these groups.

Reliability. The next set of analyses provides information about the reliability of the LSI-OR for the total YO sample and for the subsample of 57 YOs, who had two (test-retest) LSI-OR assessments completed. Regarding reliability for the total sample, computing Cronbach’s alpha for each section total and their corresponding subscale scores assessed the internal consistency of the LSI-OR. The overall coefficient for the LSI-OR General risk/need factor (Section A) total score was $\alpha = .89$, with subscale alphas ranging from .18 to .88. The overall coefficient for the Specific risk/need factor total score was .58 with subscale alphas of .51 and .37. Institutional factors, Other Client issues, and Responsivity factors’ alphas were .75, .57, and .30, respectively. These coefficients are reported in Table 19.

Table 12

Internal Consistency Estimates¹ of LSI-OR Subscales & Section Totals (N=154)

LSI-OR subscales/sections (items)	Total sample
General risk/need factors (43)	.888
Criminal history (8)	.876
Education/employment (9)	.718
Family/marital (4)	.179
Leisure/recreation (2)	.608
Companions (4)	.574
Procriminal attitudes (4)	.594
Substance abuse (8)	.740
Antisocial patterns - subitems (15)	.721
- total items (4)	.514
Total specific risk/need factors (23)	.583
Personal problems [†] (14)	.513
History ^{††} (9)	.365
Institutional factors ² (9)	.746

Table 12 (continued)

Internal Consistency Estimates¹ of LSI-OR Subscales & Section Totals (N=154)

LSI-OR subscales/sections (items)	Total sample
Other client issues (19)	.569
Responsivity factors (8)	.290

Note. ¹ refers to Cronbach's alphas. ² Institutional factors are specific to institutional group, n = 57. [†] refers to Specific risk/need factors with criminogenic potential subscale. ^{††} refers to Specific risk/need factor subscale, History of perpetration.

Pearson product moment intercorrelation coefficients for the General risk/need factors and Part-whole correlations are shown in Table 13. Intersubsection correlations ranged from a high of .63, $p < .001$, for Antisocial pattern and Criminal history, to a non-significant low correlation of .11 for Companions and Education/employment. The intersubsection correlation between Companions and Family/marital was .03 and was not significant. The average intersubsection correlation across all combinations was $r = .38$. Part-whole correlations ranged from .47 for both Family/marital and Companions to .81 for Antisocial pattern.

Table 14 shows correlations between the Specific risk/need factors total and each of its two subscales, ranging from .92, $p < .001$, between the Specific risk/need factors total score and Personal problems with criminogenic potential, to a correlation of .32, $p < .001$, for the Specific risk/need factors' total score and History of perpetration subscale.

As per Table 14, Pearson Product moment correlation coefficients for the association between each of the General risk/need factor subscales and the Specific risk/need factors total

section score and its two subscale scores were also examined. Total General and total Specific sections correlated at .58, $p < .001$. Specific risk/needs factors section total correlated robustly with each and every subsection of Section A. Its highest associations were, in descending order, with Antisocial patterns, Procriminal attitude/orientation, Criminal history, and Education/employment.

Personal problems with criminogenic potential's four highest correlations were with Procriminal attitudes, Education /employment, Criminal history, and Leisure/recreation. The History of perpetration exhibited generally lower correlations with the General risk/need factors' subsections than did the Personal problems subsection. One correlation was significant at .001, that with Criminal history ($r = .28$), but other significant correlations being weaker. Four correlations were not significant at all, showing that History of perpetration and related issues were not associated with Education/employment, Family/marital, Leisure/recreation and Companions' Section A subsections.

Table 13

LSI-OR General Risk/Need Factors Intercorrelations and Reliability Estimates

LSI-OR (items)	History ¹	Educat/ employ ²	Family/ marital ³	Leisure/ recreat ⁴	Comp ⁵	Pro- criminal ⁶	Subst. abuse ⁷	Anti- social ⁸
History ¹ (8)	-							
Edu/empl ² (9)	.28***	-						
Fam/mar ³ (4)	.31***	.24**	-					
Leis/rec ⁴ (2)	.20*	.54***	.26**	-				
Comp ⁵ (4)	.35***	.11	.03	.30***	-			
Procrim ⁶ (4)	.28***	.38***	.17*	.28**	.25**	-		
Subst ⁷ (8)	.39***	.37***	.26**	.36***	.36***	.29***	-	
Anti ⁸ (4)	.63***	.50***	.44***	.39***	.29***	.59***	.42***	-
Section A total	.75***	.70***	.47***	.57***	.47***	.57***	.71***	.81***

Note. ¹ refers to Criminal history subscale. ² refers to Education/employment subscale. ³ refers to Family/marital subscale. ⁴ refers to Leisure/recreation subscale. ⁵ refers to Companions subscale. ⁶ refers to Procriminal attitudes subscale. ⁷ refers to Substance abuse subscale. ⁸ refers to Antisocial patterns subscale. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 14

Specific Risk/Need Factor Correlations with General Risk/Need Subscales and Section Total

General & Specific Scales	Personal Problems †	History ††	Tot Specific Risk/Need
General risk/need factors	.61***	.25**	.58***
Criminal history	.40***	.28***	.43***
Education/employment	.47***	.08	.41***
Family/marital	.24**	.15	.25**
Leisure/recreation	.40***	.04	.33***
Companions	.27**	.09	.25**
Procriminal attitudes	.48***	.16*	.45***
Substance abuse	.37***	.20*	.37***
Antisocial patterns	.55***	.17*	.50***
Personal problems †	-	.32***	.92***
History ††	-	-	.66***
Total Specific risk/need	-	-	-

Note. Coefficients derived from the total sample (N = 154). † Refers to Specific risk/need factor subscale, Personal problems with criminogenic potential (B1). †† Refers to Specific risk/need factor subscale, History of perpetration (B2). * $p < .05$. ** $p < .01$. *** $p < .001$.

In Table 15, correlations between all of the LSI-OR sections can be found. A high association occurred between the General risk/need factors total score and Specific risk/need factors total score. No significant association occurred between Institutional factors and all other LSI-OR sections. The strong positive association between the Specific risk/need factor and the Responsivity factors sections supports the hypothesis that, as the total number of specific risk/needs increases, so does the total number of offender responsivity concerns (i.e., motivational problems, denial/minimization, low intelligence, etc). The responsivity concerns were highly correlated with the General risk/need section. Other client issues section was also robustly correlated with General, Specific and Responsivity Sections, whereas such correlations for Institutional factors were all non-significant for the Caucasian male young offenders from Northern Ontario.

Table 16 reveals Pearson product correlations between the Strength total and both the General and Specific risk/need factors subscales. Two significant negative (as expected) associations were found between Strengths and Family/marital subscale and between Strengths and Antisocial patterns subscale. Surprisingly, there were no significant associations between the Strengths total and the General and Specific risk/needs factors sections, as well as their respective subscales, other than the already mentioned Family/marital and Antisocial patterns.

Unexpectedly, the Strengths variable demonstrated no significant associations with the LSI-OR Sections A, B, C, F, and G.

Table 15

LSI-OR Sections' Intercorrelations

LSI-OR Sections	General	Specific	Institution. ³	Client issues ⁴	Responsiv. ⁵
	risk/need ¹	risk/need ²			
General risk/need ¹	-				
Specific risk/need ²	.58***	-			
Institutional ³	.09	.07	-		
Client issues ⁴	.36***	.35***	.09	-	
Responsivity ⁵	.51***	.57***	.06	.18*	-

Note. Coefficients derived from the total sample ($N = 154$). ¹ refers to General risk/need factors, (Section A tot). ² refers to Specific risk/need factors, (Section B tot). ³ refers to Institutional factors, (Section C tot). ⁴ refers to Other client issues (Section F tot). ⁵ refers to Responsivity factors (Section G tot). * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 16

Strengths' Correlations with the LSI-OR Scales and Subscales

General risk/need factor total and subscales	Pearson <i>r</i>
General risk/need factors total score (Section A)	-.129
Criminal history	-.037
Education/employment	-.097
Family/marital	-.206*
Leisure/recreation	-.064
Companions	-.073
Procriminal attitudes	-.063
Substance abuse	-.069
Antisocial patterns	-.173*
Specific risk/need factors total score (Section B)	-.021
Specific risk/need factors [†]	-.016
History ^{††}	-.020
Institutional factors (Section C)	.083

Table 16 (continued)

Strengths' Correlations with the LSI-OR Scales and Subscales

General risk/need factor total and subscales	Pearson <i>r</i>
Other client issues (Section F)	-.036
Responsivity considerations (Section G)	-.042

Note. Coefficients derived from the total sample ($N = 154$). [†] refers to Specific risk/need factors with criminogenic potential. ^{††} refers to Specific risk/need factor subscale, History of perpetration. All other correlation coefficients are not significant ($p > .05$). * $p < .05$.

LSI-OR reliability testing involved examination of its temporal stability (test-retest correlations) and inter-rater consistency (agreement) simultaneously. These were tested on the sample of 57 (37.0%) subjects who had two assessments completed by two different raters. Of these 57 participants who were tested twice, 24 (42.1%) were community offenders and 33 (57.9%) were institutional youth.

As the retest data were derived from 'scores of convenience,' a 'hybrid' (not standard) reliability estimate is presented on collapsed (custody and community) Caucasian male subjects, who had two LSI-OR assessments completed. In using two different raters and two different (short and long-delay) test-retest periods, the lack of agreement could be due either to changes over time or to differences between raters, or both. Therefore, such a 'hybrid' method resulted in a conservative estimate of the LSI-OR Scales's reliability. This method was selected after all other traditional approaches were excluded, such as separate analyses of temporal stability and inter-rater consistency, or common statistical approaches to testing inter-rater agreement, such as

Cohen's kappa. The latter could not be completed due to reduced n and absence of certain LSI-OR risk categories, required to be not different for both administrations, which was not met.

First, a robust correlation between the two LSI-OR total scores was obtained, which was $r = .634, p < .001$. Table 17 shows that test-retest reliability estimates were significant for all LSI-OR subscales and sections, with the exception of Specific risk/need factor's Personal problems with criminogenic potential, Strengths, and Institutional factors sections. Significant correlations ranged from .79 for Specific risk/need factor's History of perpetration subscale, to .26 for Leisure/recreation subscale of the General risk/need factor scale. Specific risk/need factors total, and especially its History of perpetration subscale, did very well in terms of showing strong test-retest correlations of .51 and .79, respectively ($p < .001$).

Table 17

Test/Retest Reliability Coefficients (n=57)

LSI-OR subscales and sections	<i>R</i>
General risk/need factors total	.63***
Criminal history	.71***
Education/employment	.47***
Family/marital	.72***
Leisure/recreation	.26*
Companions	.42**
Procriminal attitude/orientation	.53***
Substance abuse	.70***
Antisocial patterns	.56***
Specific risk/need factors total	.51***
Personal problems [†]	.26
History ^{††}	.79***
Strengths total score	.06
Institutional factors total	-.07

Table 17 (continued)

Test/Retest Reliability Coefficients (n=57)

LSI-OR subscales and sections	<i>R</i>
Other client issues total	.54 ^{***}
Responsivity factors total	.34 ^{**}

Note. [†] refers to Specific risk/need factors, Personal problems with criminogenic potential. ^{††} refers to Specific risk/need factor subscale, History of perpetration. * $p < .05$, ** $p < .01$, *** $p < .001$.

To advance the assessment of inter-rater reliability and temporal stability simultaneously, the General and Specific risk/need factors total scores, Initial and Final risk/need levels (interval data), and Strengths total scores, were compared on their test-retest correlations (Table 18), looking at the possibility of their decreasing over time.

These analyses were completed on the same 57 participants whose double LSI-OR data were obtained over a mean inter-test interval of 316.63 days ($SD = 166.03$), with a minimum of 43 and maximum of 754 days between the first and second administration of the LSI-OR Scale. As per Table 18, these 57 participants were grouped into the two time intervals of 12 months each. This exercise was meant to demonstrate the level of initial inter-rater reliability but also show that the instrument was sensitive to dynamic changes of the client, by revealing decreasing reliability over time.

Table 18 demonstrates the inter-rater reliability indices when the lapse time is 'short,' between 43 to 365 days ($M = 215.5$, $SD = 79.6$) and when it is 'longer,' between 365 to 754 days ($M = 503.7$, $SD = 111.7$). A strong and highly significant association between the two LSI-OR

General risk/need factor total scores was found during the short lapse time, $r = .75, p < .001$.

The association unmistakably weakened over time, during the longer inter-test interval,

Pearson's r having become moderate and less significant, $r = .53, p < .05$. As for the Specific risk/need factors, a similar pattern was noted regarding their total scores at test-retest. A robust and highly significant association between them was found during the short lapse time, $r = .57, p < .001$, which diminished during the longer inter-test interval period, becoming somewhat smaller and not significant, $r = .41, p > .05$. This latter finding of no significance, in spite of the moderate strength of the correlation, could be partly related to the smaller n of 20 in the longer inter-test interval period, as compared to the short inter-test interval period, when n was 37.

Similarly, for the LSI-OR risk levels (at test and re-test), Spearman correlation coefficients indicate a similar declining tendency from the short to the longer inter-test intervals. In particular, for the initial LSI-OR risk categories, Spearman correlations between the two LSI-OR tests show significant deterioration over time, from being a very strong and significant association to being much weaker and not significant one. However, this is not the case for the final LSI-OR risk categories, their inter-correlation for the longer inter-test interval being somewhat smaller, yet, remaining significant ($Rho = .61, p < .001$ to $Rho = .47, p < .05$).

Interestingly, it may suggest that the 'override' is being used to bring the risk level more in line with the first assessment's risk level, since it is somewhat higher than the initial risk level's r for the longer delay group. Unfortunately, there is no way of knowing if or how many of the retests in either interval group were blind to the previous test.

Finally, the Strengths variable's inter-correlations between the two LSI-OR assessments during the two inter-test interval periods show the lack of association during both times. It may indicate that, perhaps, there was no association between the offenders' perceived strengths,

whether the re-assessment is completed soon or later, but it might also mean that the assessment of Strengths in young offenders is lacking.

Table 18

Pearson r and Spearman Rho Coefficients Between LSI-OR (1) and LSI-OR (2) Variables

	Inter-test interval			
	43 to 365 days ¹		366 to 754 days ²	
	<i>n</i> = 37		<i>n</i> = 20	
LSI-OR sections, risk levels and strengths	Pearson	Spearman	Pearson	Spearman
General risk/need factors total score	.75***		.53*	
Specific risk/need factors total score	.57***		.41	
Initial risk categories		.69***		.37
Final risk categories (override)		.61***		.47*
Strengths total score	.02		.44	

Note. *N* = 57. ¹*M* = 215.5, *SD* = 79.6. ²*M* = 503.7, *SD* = 111.8. * $p < .05$, *** $p < .001$.

Factor analysis. For construct validity evaluation, a factor analysis was conducted on the LSI-OR General risk/need factor items in order to examine whether the items reduced to approximately 8 factors, which corresponded to the 8 subscales. The factor analysis was to discover the pattern of relationships among the variables (Darlington, 2002), by examining only "meaningful" variance accounted for by one or more "latent factor", eliminating error variance, and exploring interdependency and data pattern delineation (Malle, 2002, p.1; Rummel, 2002).

Since the distribution of the respective variables was inspected to be normal and the researcher wished to obtain parameters reflecting natural (correlated) latent constructs or factors, maximum likelihood method of extraction with an oblique rotation was chosen, reintroducing colinearity back into the factor solution (Clough, 2002).

In order to avoid undue variance overlap, several items with a logical relationship between them (e.g. No anti-criminal acquaintances, No anti-criminal friends; Alcohol problem currently, Alcohol problem ever; etc.) have been collapsed into single, no longer binary, items (a priori method). In addition, from the Antisocial Pattern subsection, only item 40 was utilized because items 41, 42, and 43 were repetition of items from other subscales. As a result, only 33 out of the original 43 Section A's items were entered into the factor analysis.

Extracted factors were rotated to an oblique solution and a scree plot (Appendix D, Figure D1) was used to determine the optimal number of factors. An optimal factor composition was determined using the following criteria: (1) primary loadings of 0.42, based on the formula for significance of factor loadings (Norman & Strainer, 1999, p.146): the loadings must be greater than $5.152/\sqrt{(N-2)}$; (2) more than three items per factor, and (3) clear interpretability of items (Clough, 2002; Darlington, 2002).

Nine large factors emerged from the initial factor analysis based on the Keiser rule of retaining eigenvalues greater than 1.0, which together accounted for 59.62 % of the variance. However, the items' loadings on the nine factors did not meet the earlier presented criteria for optimal factor composition. There were many items (10), which loaded on two or more factors, in particular criminal history and current offence-related items, as well as history of problematic peer/authority interaction-based items. They were composed in a manner unclear for interpretation and inconsistent with the scree plot, which was indicative of a two-factor solution.

Subsequently, factor analysis was replicated, forcing a two-factor oblique solution (see Scree Plot in Appendix D). The two factors together accounted for 29.51 % and the resulting factor model was tested with significant results of the fit for the model, ($\chi^2 = 678.582$, $df = 463$, $p < .001$). Table 28 presents the items comprising the two factors. These factors' pre-rotation eigenvalues were: 6.71 for Static Factor (1) and 3.03 for Dynamic Factor (2). The Static Factor accounted for 20.35 % of the variance, while Dynamic Factor accounted for 9.17 % of the variance. The factor loadings, which met the significance criterion of $r > 0.42$ (Norman & Strainer, 1999) are marked †.

The set of initial 33 items comprised one factor with 7 significant primary factor loadings and second factor with 12 significant primary factor loadings, leaving 14 items, which did not load significantly, on either factor. The items (4, 23, 32) that did not load significantly but approached significance were consistent with the direction and the meaning of the other items, which significantly loaded on both factors. There were 5 items greater than .30, which are sometimes used as indicator (4, 11, 21, 23, 32) and 2 of them had double loadings (11 & 21). It illustrates an overlap between the static and dynamic factors, which was expected, and is formally reflected in the 2 factors' correlation of .32.

The frequency of endorsement was either high or low for some of the items that did not significantly load on either factor. For example, 3 items representing being unemployed for a full year (currently, frequently, never), which were combined into one item that entered factor analysis, were endorsed 70% of the time, showing that the issues related to unemployment are a pervasive problem in the sample of Caucasian male youth from northern Ontario. At the same time, they could not be explained by any of the two underlying latent variables (factors).

Some other nonsignificant loadings were associated with the items that were very infrequently endorsed, such as the item from the family/marital cluster, Dissatisfaction with marital or equivalent, endorsed only 6% of the time. This is in comparison to 16% endorsement for Nonrewarding, other relatives, 34% for Criminal, family/spouse, and 48% endorsement for Nonrewarding, parental, all from the same family of items. Analyses revealed that these four family/marital items' intercorrelations were weak (see Cronbach's $\alpha = .179$), demonstrating that the General risk/need factor's Family/marital subscale taps into a variety of unrelated characteristics, none of which can be explained by either one of the underlying latent variables (factors).

Factor 1 was labeled Static Factor as it encompassed items related to criminal history. Factor 2 was labeled Dynamic Factor and it included four dynamic item clusters related to educational performance, achievement, school relationships and conduct, as well as those related to leisure time patterns, unconventional attitudes, and a broad spectrum of substance abuse-related issues. Static and Dynamic factors were found to be intercorrelated at .323, as per factor correlation matrix, Oblimin rotation method. Even though the oblique rotation used did not put constraints on these factors to remain orthogonal and in spite of the fact that they were correlated to some extent, none of the 33 items significantly loaded on both factors.

Regarding the Static factor, all 7 significant items demonstrated very high loadings on this factor, much higher than those of other items. These items reflected the criminal history domain and their loadings varied from the lowest of .651 for two items, (i.e., ever incarcerated and ever punished for institutional misconduct), to the highest loading of .858 for, Two or more prior adult/youth dispositions. All the above items clearly reflected a static (historic) and unalterable domain.

Regarding the Dynamic factor, it encompassed 12 items, which significantly loaded on it, representing dynamic (changeable) attitudinal and social/interactional items, also including strong representation of variables related to school performance, compliance with authorities and achievement. There were also two important items related to the use of time (leisure activities) and participation in organized activities that loaded on Dynamic factor of the LSI-OR.

Table 19 presents the items comprising the two, Static and Dynamic, LSI-OR factors, uncovered through the use of factor analysis, maximum likelihood with oblique rotation.

Table 19

LSI-OR Section A 33 Items' Primary Factor Loadings on 2 Factors: Static and Dynamic

Item no.	LSI-OR items' number	LSI-OR Section A items' descriptions	Static factor loading	Dynamic factor loading
1	A1.1	Any prior y.o./adult dispositions	.771 [†]	.239
2	A1.2	Two or more prior adult/youth disposit.	.858 [†]	.221
3	A1.3	Three or more prior adult/youth disposit	.741 [†]	.105
4	A1.4	Three or more present offences	.372	.261
5	A1.5	Arrested or charged under age 16	.679 [†]	.171
6	A1.6	Ever incarcerated upon adjudication	.651 [†]	.358 [†]
7	A1.7	Ever punished for institut. misconduct	.651 [†]	.321
8	A1.8	Charge laid, probat. breached or parole	.738 [†]	.316
9	A2.9 A2.10			
	A2.11	Unemployed for a full year now, frequent, never	-.056	.234
10	A2.12 A2.13	Less than regular grade 10,12 or equival.	.278	.469 [†]
11	A2.14	Suspended or expelled at least once	.358	.334
12	A2.15	Participation/Performance	.239	.659 [†]
13	A2.16	Peer interactions	.099	.468 [†]

Table 19 (continued)

LSI-OR Section A 33 Items' Primary Factor Loadings on 2 Factors: Static and Dynamic

Item no.	LSI-OR items'		Static factor loading	Dynamic factor loading
	number	LSI-OR Section A items' descriptions		
14	A2.17	Authority interactions	.085	.534 [†]
15	A3.18	Dissatisfaction with marital or equivalent	.043	.001
16	A3.19	Nonrewarding, parental	.138	.230
17	A3.20	Nonrewarding, other relatives	.179	.256
18	A3.21	Criminal – Family/Spouse	.226	.136
19	A3.22	No recent participation in organized activity	.168	.483 [†]
20	A4.23	Could make better use of time	.169	.569 [†]
21	A5.24			
	A5.25	Some criminal acquaintances/friends	.344	.357
22	A5.26			
	A5.27	No anti-criminal acquaintances/friends	.179	.209
23	A6.28	Supportive of crime	.111	.342
24	A6.29	Unfavourable toward convention	.327	.439 [†]
25	A6.30	Poor, toward sentence/offence	.077	.257

Table 19 (continued)

LSI-OR Section A 33 Items' Primary Factor Loadings on 2 Factors: Static and Dynamic

Item no.	LSI-OR items'		Static factor loading	Dynamic factor loading
	number	LSI-OR Section A items' descriptions		
26	A6.31	Poor, toward supervision/treatment	.215	.250
27	A7.32			
	A7.34	Alcohol problem, ever/currently	.108	.456 [†]
28	A7.33			
	A7.35	Drug problem, ever/currently	.295	.620 [†]
29	A7.36	Law violations	.336	.466 [†]
30	A7.37	Marital/Family	.290	.487 [†]
31	A7.38	School/Work	.249	.567 [†]
32	A7.39	Medical or other clinical indicators	-.002	.315
33	A8.40	Specialized assessment for Antisocial pattern	.166	.078

Note. [†] refers to factor loadings meeting the significance criterion of $r > 0.42$ (Norman & Streiner, 1999).

Offender recidivism

This section presents an analysis of recidivism, the main dependent variable in this study. At first, the mean follow-up time and recidivism rates are described for the total sample and for the custody and community subgroups. Subsequently, general, violent and nonviolent recidivism is discussed within the context of the subgroups of interest. Following that, the results of survival analyses for the total sample and the subgroups are described.

Follow-up time and recidivism rates. The mean follow-up time for the current institutional (custody) sample was the follow-up date (CPIC) minus the release date from institution to the community. For the community offenders, it was the follow-up date (CPIC) minus the LSI-OR administration date. The mean follow-up time for the total sample ($N = 154$) was 1371.22 days ($SD = 138.43$), or 3.76 years, with the minimum of 968.00 (2.7 years) and maximum of 1790.00 (4.9 years). This time represented the average time that young offenders in the current study were eligible to recidivate.

For the custody offenders, their mean follow up time was 1335.07 ($SD = 127.04$) and, for the community offenders, it was 1392.46 ($SD = 141.05$) days. A pooled t test, $t(152) = 2.528$, $p = .013$, confirmed that the mean follow up time for the custody group was significantly less than that for the community group. By the end of the follow-up period, 50.6% of all young offenders recidivated based on any convictions, 20.1% recidivated based on any violent convictions and 46.8% recidivated based on any nonviolent convictions. Table 20 demonstrates the rates of general, violent and nonviolent recidivism for the current (total) sample and for the custody/community subgroups.

Table 20

Recidivism Rates of General, Violent, and Nonviolent Offenders: Custody and Community Groups

Sample (N)	% Recidivists			Mean number of convictions		
	General	Violent	Non-violent	General	Violent	Non-violent
Custody (57)	73.7	28.1	68.4	4.21	0.51	3.70
Community (97)	37.1	15.5	34.0	1.67	0.25	1.42
Total (154)	50.6	20.1	46.8	2.61	0.34	2.27

General recidivism. Seventy-eight young offenders (50.6%) from the current sample of 154 recidivated based on any convictions (yes-no) criteria. Seventy-six offenders (49.4%) did not engage in any violent criminal activity during the 3.8-year-long follow up period. Table 21 shows distribution of young offenders across location (custody-community) by general recidivism (yes-no). With an alpha set at .001, the custody and community offenders differed significantly in terms of their distribution patterns across 'yes' (recidivated) and 'no' (did not recidivate) categories of variables, $\chi^2 (1, 154) = 19.210, p < .001$. Based on this distribution (in Table 21), the odds of recidivating were calculated for the custody and community young offenders. By dividing the odds for custody offenders by those for community offenders, an odds ratio was obtained, in accordance with the following formula (Pedhazur, 1997):

$$OR = (a/c)/(b/d) = (ad)/(bc)$$

Table 21

A 2 x 2 Design: Observed Distribution of Young Offenders (N = 154) Across Location (1 = Custody; 0 = Community) by General Recidivism (1 = Yes; 0 = No)

Recidivism	Custody	Community	Total
Yes	42 (a)	36 (b)	78 (a+b)
No	15 (c)	61 (d)	76 (c+d)
Total	57 (a+c)	97 (b+d)	154

Note. (a) = number of custody offenders who recidivated; (b) = number of community offenders who recidivated; (c) = number of custody offenders who did not recidivate; (d) = number of community offenders who did not recidivate.

Based on the numbers presented in Table 21, it was established that the general recidivism's odds were 4.74 times greater (more favorable) for custody than community offenders, $OR_{cust} = (42 \times 61) / (36 \times 15) = 2562 / 540 = 4.74$.

The odds ratio for community offenders, $OR_{comm} = (36 \times 15) / 61 \times 42 = 540 / 2562 = 0.211$, indicates that the odds of becoming a recidivist, rather than a nonrecidivist, were .211 times greater, or $(1 - .211 = .789)$ 79% less likely for a community offender than a custody offender.

Table 22 reveals that there were significant differences between custody and community groups on several selected recidivism variables. These two groups differed in terms of the number of convictions and charges they received, the most serious offence, and the number of breach offences for which they were convicted.

Table 22

Custody-Community Comparisons on Selected Recidivism Variables

Recidivism variable	Custody		Community		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Num of convictions	4.21	5.00	1.67	3.19	-7.312***	152
Num of Charges	5.28	6.34	2.18	4.11	-3.313**	84.038
Most serious offense	14.63	9.38	7.35	9.95	-4.478***	152
Num of breaches	1.56	1.84	0.73	1.52	-2.871*	100.621

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

Violent recidivism. Thirty one (20.1%) young offenders from the current sample of 154 recidivated violently, based on any violent convictions (yes-no) criteria. One hundred twenty three (79.9%) did not engage in any violent criminal activity during the 3.8-year-long follow up period. Table 23 shows distribution of young offenders across location (custody-community) by general recidivism (yes-no). With an alpha set at .05, the custody and community offenders did not differ significantly in terms of their distribution patterns across 'yes' (violently recidivated) and 'no' (did not violently recidivate) categories of variables, $\chi^2 (1, 154) = 13.549, p = .060$.

Based on this distribution (in Table 23), the odds of recidivating were calculated for the custody and community young offenders. By dividing the odds for custody offenders by those for community offenders, an odds ratio was obtained.

Table 23

A 2 x 2 Design: Observed Distribution of Young Offenders (N = 154) Across Location (1 = Custody; 0 = Community) by Violent Recidivism (1 = Yes; 0 = No)

Violent recidivism	Custody	Community	Total
Yes	16 (a)	15 (b)	31 (a+b)
No	41 (c)	82 (d)	123 (c+d)
Total	57 (a+c)	97 (b+d)	154

Note. (a) = number of custody offenders who recidivated; (b) = number of community offenders who recidivated; (c) = number of custody offenders who did not recidivate; (d) = number of community offenders who did not recidivate.

Based on the numbers presented in Table 23, it was established that the violent recidivism's odds were 2.13 times greater (more favourable) for custody than community offenders, Odds Ratio_{cust} = $(16 \times 82) / (41 \times 15) = 1312 / 615 = 2.133$.

The odds ratio for community offenders, OR_{comm.} = $(15 \times 41) / (82 \times 16) = 615 / 1312 = 0.469$, indicates that the odds of becoming a violent recidivist rather than not recidivating violently, were .469 times greater, or $(1 - .469 = .531)$ 53% less likely for a community offender than for the custody offender.

For the number of violent convictions, the custody offenders ($M = .51$, $SD = 1.00$) were found to be not significantly different from community offenders ($M = .25$, $SD = .78$), $t(95.657)$, $p = .094$. However, the custody offenders incurred significantly higher number of violent charges as compared to their community counterparts, ($M = .84$, $SD = 1.42$ and $M = .38$, $SD = 1.31$), t

(109.749) = 1.996, $p = .048$. As for the most serious violent offence, (based on the Ministry's 26 offence categories), although the custody offenders' average most serious offence ($M = 18.70$, $SD = 3.62$) was a lower (seriousness) category than that of the community group ($M = 20.75$, $SD = 4.79$), these levels of seriousness in offending were not significantly different, $t(19.852) = -1.142$, $p = .267$. When violent recidivists from the custody and community groups were compared on their most serious offence (violent and nonviolent), almost identical results ($M = 19.94$, $SD = 4.06$ and $M = 19.67$, $SD = 3.94$, respectively) were discovered, $t(29) = .188$, $p = .852$.

Nonviolent recidivism. Seventy-two young offenders (46.8%) from the current sample of 154 recidivated nonviolently, while eighty-two offenders (53.2%) did not engage in any nonviolent criminal activity during the 3.8-year-long follow up period. Table 24 shows distribution of young offenders across location (custody-community) by nonviolent recidivism (yes-no). With an alpha set at .001, the custody and community offenders significantly differed in terms of their distribution patterns across 'yes' (nonviolently recidivated) and 'no' (did not nonviolently recidivate) categories of variables, $\chi^2(1, 154) = 17.067$, $p < .001$. Based on this distribution (in Table 24), the odds of recidivating were calculated for the custody and community young offenders. By dividing the odds for custody offenders by those for community offenders, an odds ratio was obtained.

Table 24

A 2 x 2 Design: Observed Distribution of Young Offenders (N = 154) Across Location (1 = Custody; 0 = Community) by Nonviolent Recidivism (1 = Yes; 0 = No)

Nonviolent			
recidivism	Custody	Community	Total
Yes	39 (a)	33 (b)	72 (a+b)
No	18 (c)	64 (d)	82 (c+d)
Total	57 (a+c)	97 (b+d)	154

Note. (a) = number of custody offenders who recidivated; (b) = number of community offenders who recidivated; (c) = number of custody offenders who did not recidivate; (d) = number of community offenders who did not recidivate.

Based on the numbers presented in Table 24, it was established that the nonviolent recidivism's odds were 4.20 times greater (more favourable) for custody than community offenders, $OR_{cust} = (39 \times 64) / (33 \times 18) = 2496 / 594 = 4.202$.

The odds ratio for community offenders, $OR_{comm} = (33 \times 18) / (39 \times 64) = 594 / 2496 = 0.238$, indicates that the odds of becoming a nonviolent recidivist rather than not recidivating nonviolently, were .238 times greater, or $(1 - .238 = .762)$ 76% less likely for a community offender than for the custody offender.

As for the number of nonviolent convictions, the custody offenders ($M = 3.70$, $SD = 4.70$) had a significantly higher number of these convictions than community offenders ($M = 1.42$, $SD = 2.95$), $t(82.157) = 3.300$, $p < .001$. The custody offenders also incurred significantly higher

number of nonviolent charges as compared to their community counterparts, ($M = 4.44$, $SD = 5.78$ and $M = 1.79$, $SD = 3.47$), $t(80.161) = 3.137$, $p < .01$. Regarding the most serious nonviolent offence (as per the ministry's 26 offence categories), the custody offenders' average most serious nonviolent offence ($M = 20.22$, $SD = 3.72$) was a higher (more serious) category than that of the community group ($M = 19.33$, $SD = 3.93$), yet these values (representing seriousness of nonviolent offending) were not significantly different, $t(54) = .860$, $p = .394$. When nonviolent recidivists from the custody and community groups were selected and compared on their total number of breach convictions, similar results ($M = 2.15$, $SD = 1.84$ and $M = 1.91$, $SD = 1.93$, respectively) for the groups were discovered, $t(70) = .550$, $p = .584$.

In summary, there is a consistent difference between the custody and community groups in terms of their different outcomes with general and nonviolent recidivism. These include a significantly different distribution of offenders across recidivism and non-recidivism categories and a significant difference on the number of convictions and charges recidivism variables. Violent recidivism is not as clearly different between these two groups as is general and nonviolent recidivism, as the distribution of offenders is not different across violent recidivism yes-no categories and there is no significant difference on the number of violent convictions. Yet, their odds of recidivating versus not recidivating are different and they significantly differ on the number of violent charges. It may be that the small numbers of violent offenders and a low base rate of violent recidivism to begin with may have been responsible for these differences being somewhat less pronounced for violent recidivism.

The above findings are in accord with the theory of offender risk, which is reflected in hypotheses of the current study. When the LSI-OR scores of specific sub-samples vary, recidivism rates should vary in the same direction. This is the case in the present study as

custody offenders' LSI-OR score and recidivism rates are both significantly higher than those of community offenders.

Survival analyses. In this section, survival analyses were conducted using the Kaplan-Meier method (Norusis, 1995; Steinberg, 1999), a widely used and a precise way of estimating the probability of a terminal event (i.e. first re-offending event). Survival techniques are often used in modeling the timing of qualitative change (Norman & Streiner, 1999), which, in the current study, means the change from nonrecidivist to recidivist status during the specified follow up period for each offender. Kaplan-Maier techniques are useful for studies with the smaller samples and where the survival intervals are variable (Steinberg, 1999).

The Kaplan-Meier method was used in order to determine the typical time of surviving during the risk time/follow up time for the whole young offender sample. Group membership (custody-community) was also examined to determine whether offender 'location' influences survival time and the differences in the rate of survival over time. Survival analyses allowed for graphic evaluation and interpretation of 'time-to recidivism' throughout the entire follow up time, comparing the recidivism rates at each point along the follow-up period. These analyses were completed for the general, violent and nonviolent recidivism.

Firstly, analysis was conducted for the entire sample. A time variable was calculated based on the time to first reconviction for the recidivist group and the duration of an offender's follow up time for the nonrecidivist group. For all young offenders, the mean survival time was 1070 days ($CI = 953, 1186, SE = 59$), which is not the arithmetic mean, equaling the area under the survival curve for the uncensored cases (Steinberg, 1999). The median survival time was 1008 days, indicating that 50 % of the sample had recidivated by this time (Steinberg, 1999).

The survival curve for general (yes-no) recidivists can be found in Figure 1. The height of the curve indicates survival probability at any one point in time, while the slope indicates changes in survival rate over time.

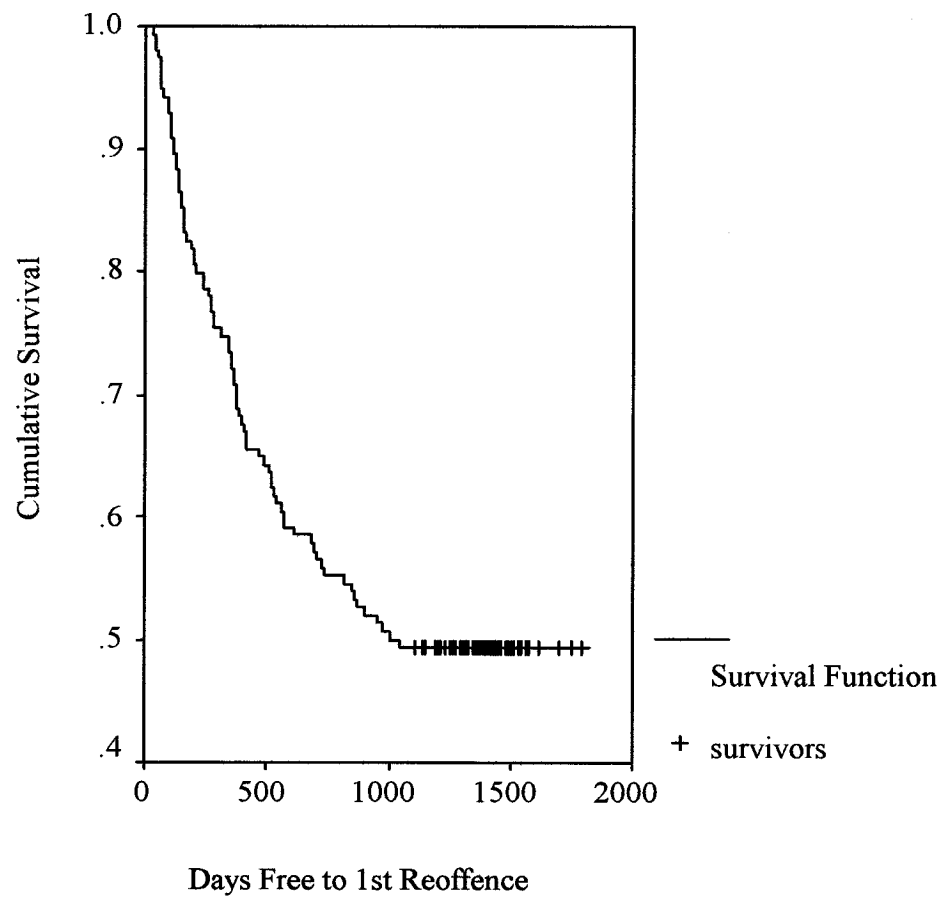


Figure 1. General Recidivism: Survival Function For All Young Offenders ($N = 154$)

Group membership evaluations for the custody and community groups were conducted. The differences in survival rates between the community and custody offenders were assessed. The mean survival time for the custody group was 613 days ($CI = 472, 753, SE = 72$) and for the community group was 1287 days ($CI = 1152, 1423, SE = 69$). The median survival time was calculated only for the custody group and it was 373 days ($CI = 323, 423, SE = 25$), because the cumulative survival never reached 0.5 (50%) in the community group.

The larger mean for the community group suggests longer survival times for this group, as confirmed by the Log Rank statistical test (Steinberg, 1999). The Log Rank test for survival times of the custody and community samples was significant ($Log Rank = 25.12, df = 1, p < .0001$), indicating that survival time for the custody offenders was significantly shorter than that of the community offenders. The Log Rank statistic was selected due to the current sample's recidivism rates being relatively close to 50% and because it employs equal weighting (of 1.00) throughout each survival time point, not emphasizing any particular recidivism points (e.g., early or late recidivism).

A graphic review of group membership and survival time can be found in Figure 2.

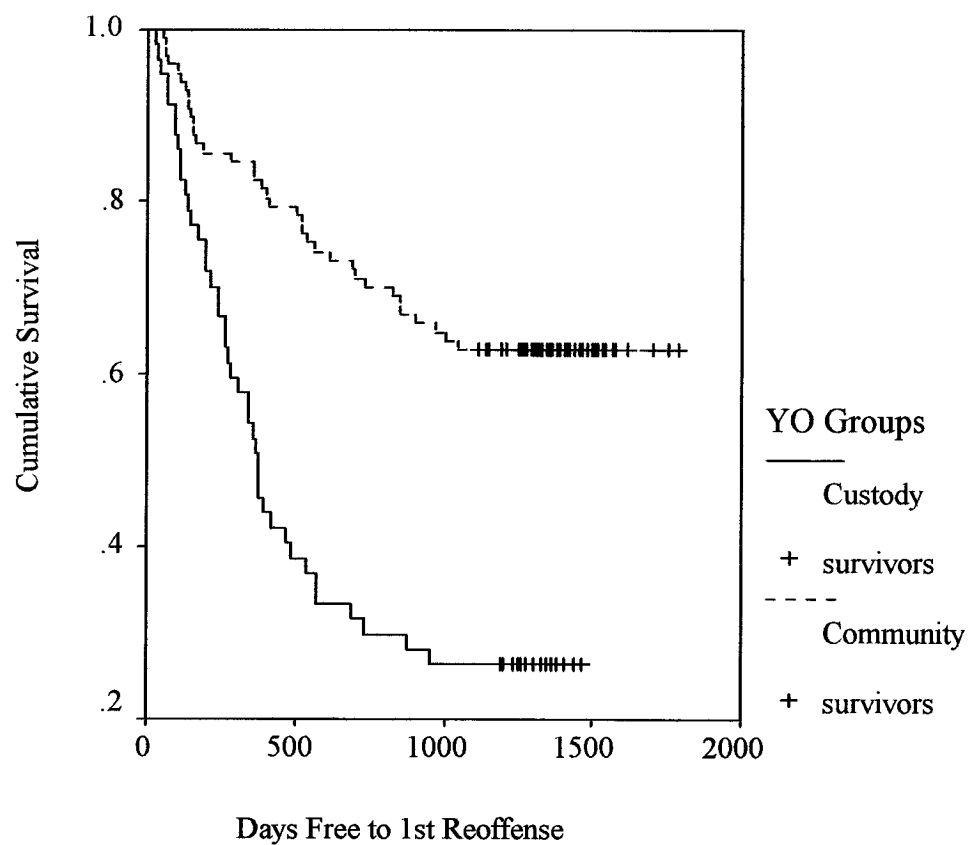


Figure 2. General Recidivism: Survival Function by Location (Custody – Community)

Figure 2 showed that the custody slope was steeper than the community slope, indicating shorter survival times for the institutionalized young offenders. The community curve was flatter and, as could be seen by the end of the follow up period, had a greater proportion of community offenders who did not recidivate (*percent censored* = 62.89 %) as compared to the custody offenders who did not recidivate (*percent censored* = 26.32 %).

It was of interest to compare the custody and community general recidivists on their time-to-recidivism, while non-recidivists were excluded. When alpha was set at .05, the custody recidivists' average time-to-recidivism was significantly shorter ($M = 309.50$, $SD = 224.28$) than their community counterparts ($M = 435.50$, $SD = 315.09$), $t(62.017) = -2.003$, $p = .05$. This provides additional evidence for a significant difference between the custody and community offenders on a 'time-to-recidivism' variable, in addition to the 'risk time' variable, which was captured by survival analyses while recidivists and nonrecidivists' risk times were combined. As to the latter time combination, the custody offenders' risk time was significantly shorter ($M = 575.53$, $SD = 490.19$) than that of the community offenders ($M = 1034.66$, $SD = 512.91$), $t(152) = -5.451$, $p < .001$.

These survival analyses were then repeated for violent recidivism, beginning with the entire sample. A time variable was calculated based on the time to first reconviction for the violent recidivist group and the duration of an offender's follow up time for the nonrecidivist group. For all young offenders, the mean survival time was 1451 days ($CI = 1345, 1556$, $SE = 54$). The median survival time was not calculated because the cumulative survival never reached 0.5 (50%) or less (Steinberg, 1999).

The survival curve for violent (yes-no) recidivists can be found in Figure 3. The height of the curve indicates survival probability at any one point in time, while the slope indicates changes in survival rate over time.

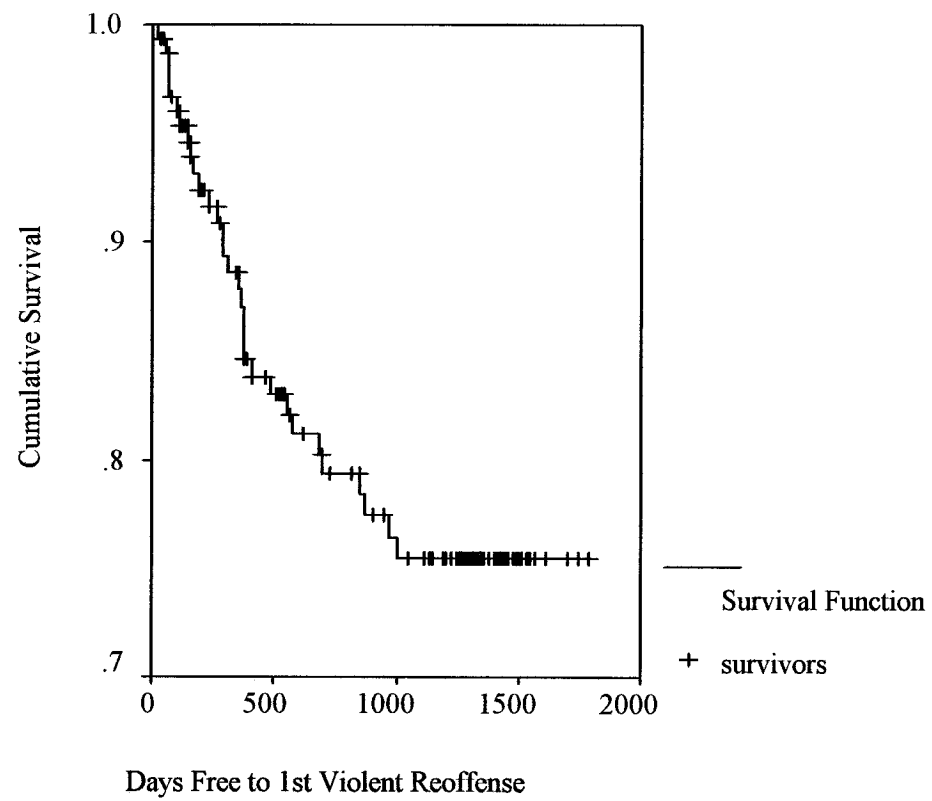


Figure 3. Violent Recidivism: Survival Function for All Young Offenders ($N = 154$).

Group membership evaluations for the custody and community groups were conducted. The differences in survival rates between the community and custody offenders were assessed. The mean survival time for the custody group was 1020 days ($CI = 846, 1193, SE = 89$) and for the community group was 1556 days ($CI = 1447, 1666, SE = 56$). The median survival time was not calculated because the cumulative survival never reached 0.5 (50%) in both groups (due to low base rates of violence).

The larger mean for the community group suggests longer survival times for this group, as confirmed by the Log Rank statistical test (Steinberg, 1999). The Log Rank test for survival times of the custody and community samples was significant ($Log Rank = 8.27, df = 1, p = .004$), indicating that there was an overall significant difference between survival curves of the custody and community offenders.

A graphic review of group membership and survival time can be found in Figure 4.

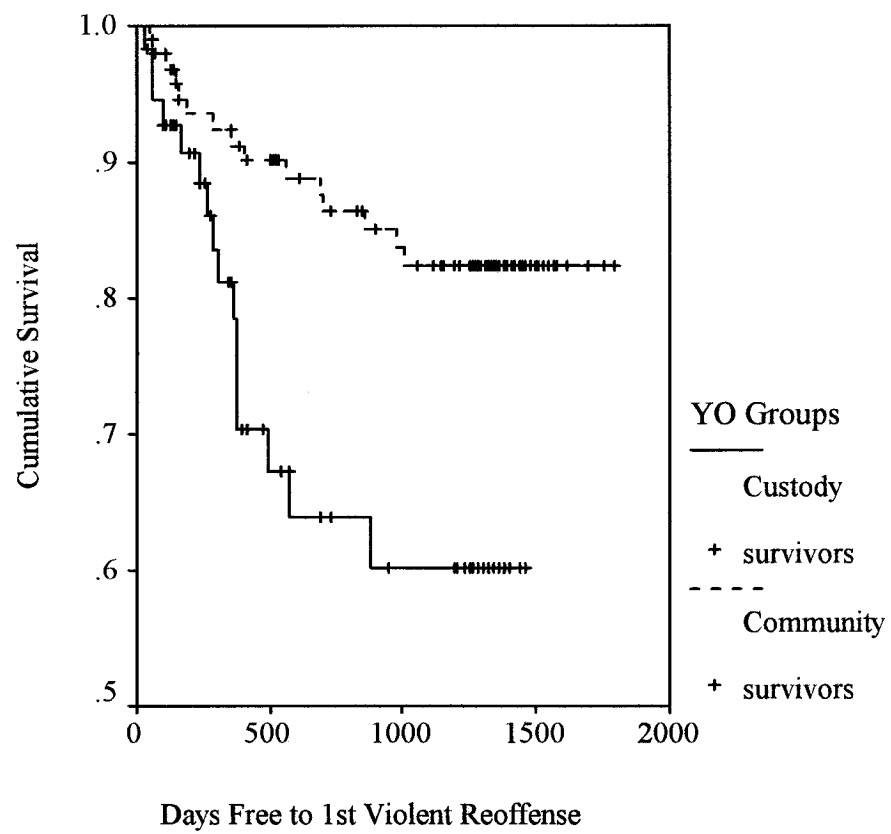


Figure 4. Violent Recidivism: Survival Function by Location (Custody-Community).

Figure 4 showed that the custody slope was steeper than the community slope, indicating shorter survival times for the institutionalized young offenders. The community curve was flatter and, as could be seen by the end of the follow up period, had a greater proportion of community offenders who did not recidivate (*percent censored* = 84.54 %) as compared to the custody offenders who did not recidivate (*percent censored* = 71.93 %).

The custody and community violent recidivists were compared on their time-to-violent recidivism, while non-recidivists were excluded. The custody recidivists' average time-to-recidivism was not significantly shorter ($M = 307.88$, $SD = 217.42$) than their community counterparts ($M = 436.20$, $SD = 336.81$), $t(23.699) = -1.251$, $p = .223$. This lack of a significant difference between the custody and community offenders on a 'time-to-recidivism' variable indicates that institution and community youth who recidivated violently did not differ in the average time it took them to recidivate. Within the context of the reported earlier Log Rank test's result, that there was an overall significant difference between the two survival curves, this lack of a significant difference between the custody and community offenders on a 'time-to-recidivism' variable suggests that their survival curves may diverge mainly due to the differing numbers of recidivists, as opposed to the speed with which they recidivated.

Regarding nonviolent recidivism, at first, analysis was conducted for the entire sample. A time variable was calculated based on the time to first reconviction for the nonviolent recidivist group and the duration of an offender's follow up time for the nonrecidivist group. For all young offenders, the mean survival time was 1108 days ($CI = 990, 1226$, $SE = 60$). The median survival time was not calculated because the cumulative survival never reached 0.5 (50%) or less (Steinberg, 1999).

The survival curve for nonviolent (yes-no) recidivists can be found in Figure 5. The height of the curve indicates survival probability at any one point in time, while the slope indicates changes in survival rate over time.

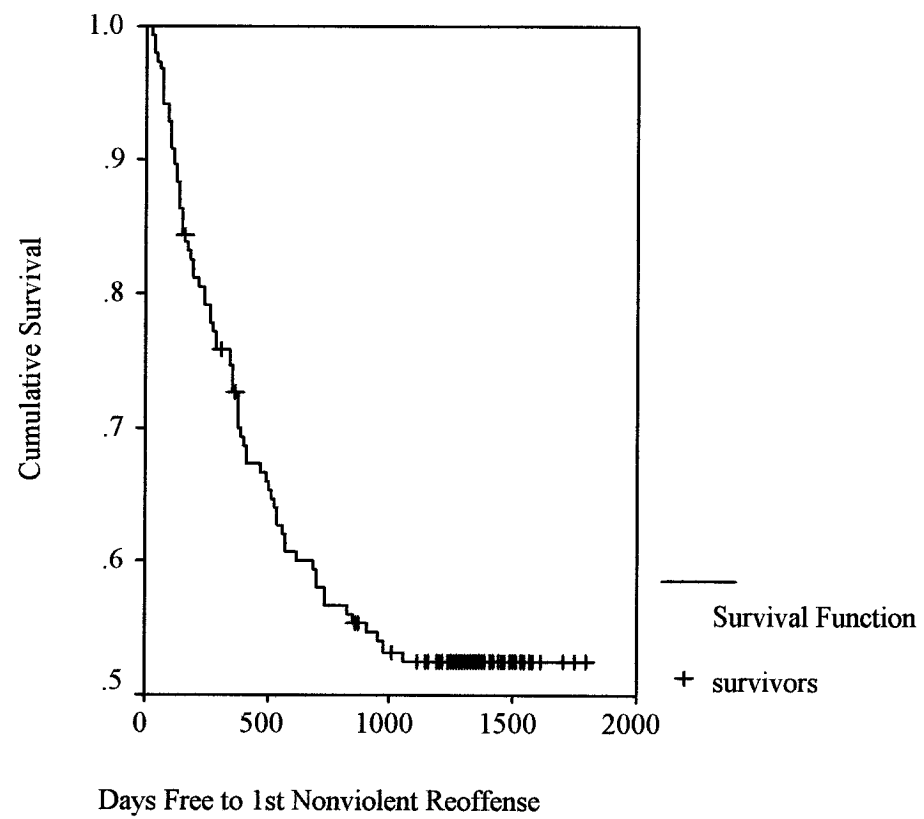


Figure 5. Nonviolent Recidivism: Survival Function for All Young Offenders ($N = 154$).

Group membership evaluations for the custody and community groups were conducted. The differences in survival rates between the community and custody offenders were assessed. The mean survival time for the custody group was 646 days ($CI = 498, 794, SE = 75$) and for the community group was 1318 days ($CI = 1183, 1453, SE = 69$). The median survival time was calculated only for the custody group and it was 376 days ($CI = 295, 457, SE = 41$), because the cumulative survival never reached 0.5 (50%) or less in the community group.

The larger mean for the community group suggests longer survival times for this group, as confirmed by the Log Rank statistical test (Steinberg, 1999). The Log Rank test for survival times of the custody and community samples was significant ($Log Rank = 23.13, df = 1, p < .0001$), indicating that there was an overall significant difference between survival curves for the custody and community offenders.

A graphic review of group membership and survival time can be found in Figure 6.

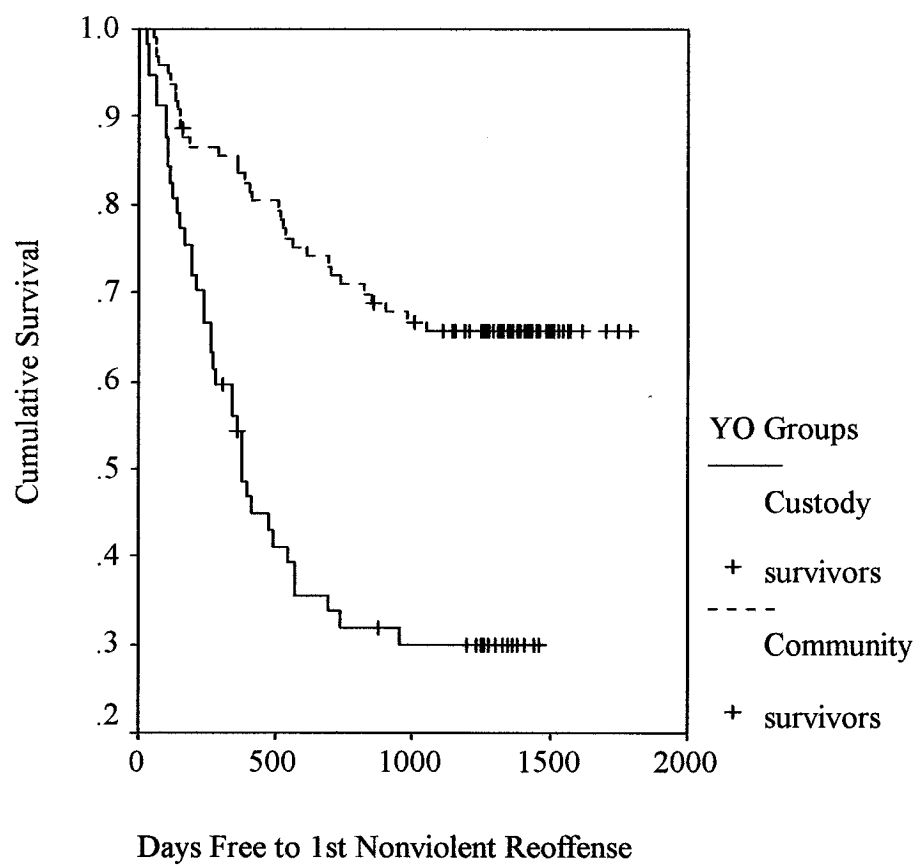


Figure 6. Nonviolent Recidivism: Survival Function by Location (Custody-Community).

Figure 6 showed that the custody slope was steeper than the community slope, indicating shorter survival times for the institutionalized young offenders. The community curve was flatter and, as could be seen by the end of the follow up period, had a greater proportion of community offenders who did not recidivate (*percent censored* = 65.98 %) as compared to the custody offenders who did not recidivate (*percent censored* = 31.58 %).

The custody and community nonviolent recidivists were compared on their time-to-nonviolent recidivism, while non-recidivists were excluded. When alpha was set at .05, the custody nonviolent recidivists' average time-to-recidivism was not significantly shorter ($M = 293.72$, $SD = 213.52$) than their community counterparts ($M = 413.91$, $SD = 299.87$), $t(56.576) = -1.926$, $p = .059$. This lack of a significant difference between the custody and community offenders on a 'time-to-recidivism' variable suggests that their survival curves may diverge mainly due to the differing numbers of recidivists, as opposed to recidivism speed.

In summary, offender survival curves were different for custody and community offenders. For all three types of recidivism, general, violent and nonviolent, the custody offenders had significantly lower survival rates than their community counterparts. Moreover, the custody recidivists' time-to-recidivate, for violent or nonviolent offending, was significantly shorter than that of the community recidivists. However, when violent and nonviolent recidivism were examined separately, there was no difference between the time to recidivate for institution and community recidivists.

Predictive Analyses

Section overview. Several predictive analyses were conducted and are reported in this section. These are in accordance with the fundamental principle of this section, which is to demonstrate the relationship between the independent and dependent variables. Therefore, the relationship between independent and dependent variables for each subgroup of interest (custody-community) is examined. While controlling for the effects of location (custody-community), assessment of various combinations of the LSI-OR variables (scales and subscales) in prediction of the general, violent and nonviolent (binary) recidivism and of the select continuous outcome variable, “Number of charges,” is completed and presented.

Initially, recidivists and nonrecidivists were compared on the LSI-OR Sections and subsections. Next, comparisons were made for the percentage of offenders across the LSI-OR four levels of risk by the binary recidivism rates (for the general, violent, nonviolent recidivists), employing the 4 x 2 chi-square analyses. Individual risk levels were compared with one another, using paired risk level comparisons (2 x 2 chi-square analyses). Simple correlations between the LSI-OR and recidivism variables were also presented. Next, not confounded by changing cutoff values or prevalence rates, The Receiver Operating Characteristic (ROC) curves were demonstrated, aimed at evaluating the diagnostic accuracy of the LSI-OR variables. Further, Survival Analyses on the LSI-OR risk levels for the total sample were conducted, controlling for the custody and community’s differing risk-time starting and ending points. Moreover, controlling for location, for LSI-OR Section A and for the theoretically-based “Big Four” recidivism predictors (Andrews & Bonta, 1998), the multiple (hierarchical logistic and blockwise/stepwise) regression analyses were employed in prediction of the binary recidivism

and the select continuous recidivism variable, Number of charges, assessing for the LSI-OR variables' incremental predictive validity.

LSI-OR's sections and subscales and recidivist-nonrecidivist status. In comparing recidivists to nonrecidivists on the LSI-OR's subscales and sections, t-tests were completed for the young offender total sample as well as for its custody and community groups. For each group, the means and standard deviations are provided in Tables 25 to 27.

For the total young offender sample (Table 25), recidivists had significantly greater mean scores on most LSI-OR section totals and subscales, except for the Specific risk/need factors history of perpetration, Strengths, and Other client issues section total. However, when standard t-test results were evaluated against modified Bonferroni t tables (i.e., Bonferroni Multi Comparison Test, 15 comparisons, $\alpha = .05$, $df = \infty$, *critical t* = 2.94), the difference between recidivists and nonrecidivists on the Family/marital and Substance abuse subscales did not remain significant (Howell, 1992).

Table 25

Recidivist (n = 78)/Nonrecidivist (n = 76) Comparisons on LSI-OR Scale's Variables

LSI-OR Variables	Nonrecidivist		Recidivist		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
General risk/need factors	10.80	6.83	18.05	7.25	6.383	152	.000
Criminal history	1.74	2.13	4.12	2.79	5.959	143.666	.000
Education/employment	2.83	2.15	4.31	2.18	4.235	152	.000
Family/marital	0.86	0.87	1.18	0.83	2.355	152	.020 ^{††}
Leisure/recreation	1.01	0.82	1.55	0.70	4.381	152	.000
Companions	1.45	0.84	1.87	0.87	3.074	152	.003
Procriminal attitudes	0.46	0.89	0.95	1.09	3.050	147.216	.003
Substance abuse	1.71	2.06	2.69	2.12	2.914	152	.004 ^{†††}
Antisocial pattern	0.74	0.94	1.41	1.13	4.012	148.406	.000
Specific risk/need total	1.84	1.90	2.79	2.00	3.029	152	.003
Personal problems [†]	1.43	1.54	2.21	1.56	3.085	152	.002
History of perpetration ^{††}	0.41	0.77	0.59	0.84	1.396	152	.165
Strengths total	0.80	1.30	0.68	1.83	-.481	152	.631

Table 25 (continued)

Recidivist (n = 78)/Nonrecidivist (n = 76) Comparisons on LSI-OR Scale's Variables

LSI-OR Variables	Nonrecidivist		Recidivist		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Other client issues	1.37	1.70	1.86	1.78	1.747	152	.083
Special responsivity	0.38	0.63	0.95	0.88	4.599	139.740	.000

Note. [†] refers to Specific risk/need factors with criminogenic potential, Personal problems. ^{††} refers to Specific risk/need factors, History of subsection. ^{†††} Bonferroni correction = not significant.

For the custody group, in Table 26, the findings were unexpected, because none of the LSI-OR variables were able to differentiate between recidivists and nonrecidivists, including the LSI-OR Criminal history subscale, after Bonferroni's correction was applied (i.e., Bonferroni Multi Comparison Test, 15 comparisons, $\alpha = .05$, $df = 50$, critical $t = 3.08$) (Howell, 1992).

Table 26

Custody Recidivist (n=42)/Nonrecidivist (n=15) Comparisons on LSI-OR Scale's Variables

LSI-OR Variables	Nonrecidivists		Recidivists		<i>t</i> (55)	<i>P</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
General risk/need factors	18.07	5.54	20.31	6.56	1.180	.243
Criminal history	3.80	2.40	5.45	2.24	2.406	.020 ^{††}
Education/employment	4.00	2.04	4.21	2.12	0.339	.736
Family/marital	1.07	0.80	1.33	0.79	1.123	.266
Leisure/recreation	1.47	0.74	1.45	0.77	-.062	.951
Companions	1.67	0.82	2.02	0.90	1.354	.181
Procriminal attitudes	0.87	0.92	1.12	1.23	0.723	.473
Substance abuse	3.40	2.38	3.14	1.83	-1.431	.668
Antisocial pattern	1.80	1.08	1.60	1.06	-.638	.526
Specific risk/need total	3.67	1.80	3.10	1.94	-.999	.322
Personal problems [†]	3.00	1.60	2.29	1.44	-1.604	.114
History of perpetration ^{††}	0.67	0.82	0.81	0.97	0.509	.613
Strengths total	1.07	1.67	0.90	2.35	-.245	.807
Other client issues	1.47	1.55	2.24	1.69	1.546	.128

Table 26 (continued)

Custody Recidivist (n=42)/Nonrecidivist (n=15) Comparisons on LSI-OR Scale's Variables

LSI-OR Variables	Nonrecidivists		Recidivists		<i>t</i> (55)	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Special responsivity	0.73	0.70	0.95	0.94	0.825	.413
Prison experience	0.00	0.00	0.10	0.43	0.851	.399

Note. All correlation coefficients not significant at .05. [†] refers to Specific risk/need factors, Personal problems. ^{††} refers to Specific risk/need factors, History of perpetration. ^{†††} Bonferroni correction = not significant

Table 27 presents the results for the community group. The LSI-OR General risk/need factors' section and most of its subscales discriminated between the community recidivists and nonrecidivists, with the exception of Family/marital, Companions and Substance abuse subscales. The Specific risk/need factors' history of perpetration subscale, Strengths total and Other client issues' sections also did not demonstrate discriminatory power based on correlations. However, when standard t-test results were evaluated against modified Bonferroni tables (i.e., Bonferroni Multi Comparison Test, 15 comparisons, $\alpha = .05$, $df = 100$, *critical t* = 3.01), the difference between recidivists and nonrecidivists on the Criminal history and Procriminal attitudes' subscales and on the Specific risk/need factors' section did not remain significant (Howell, 1992).

In conclusion, when more stringent significance criteria were applied to control for Familywise error, it was the LSI-OR's General risk/need factors (Section A), and three of its

eight subscales, which effectively discriminated between community recidivists and nonrecidivists: Education/employment, Leisure/recreation, and Antisocial pattern (personality). Other than the General risk/need factors (Section A), the Special responsivity considerations (Section G) discriminated community recidivists from nonrecidivists. The remaining LSI-OR Sections B and F, as well as the Section A's subscales Criminal history, Family/marital, Companions, Procriminal attitudes, and Substance abuse, as well as LSI-OR's Strengths total, did not discriminate between the recidivists and nonrecidivists among the community offenders.

Table 27

Community Recidivist (n=36)/Nonrecidivist (n=61) Comparisons on LSI-OR Scale's Variables

LSI-OR Variables	Nonrecidivists		Recidivists		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
General risk/need factors	9.02	5.89	15.42	7.21	4.753	95	.000
Criminal history	1.23	1.73	2.56	2.57	2.752	53.913	.008 ^{††}
Education/employment	2.54	2.09	4.42	2.27	4.129	95	.000
Family/marital	0.80	0.89	1.00	0.86	1.063	95	.290
Leisure/recreation	0.90	0.81	1.67	0.59	5.371	91.016	.000
Companions	1.39	0.84	1.69	0.82	1.716	95	.089
Procriminal attitudes	0.36	0.86	0.75	0.87	2.146	95	.034 ^{†††}
Substance abuse	1.30	1.75	2.17	2.34	1.939	58.405	.057
Antisocial pattern	0.48	0.70	1.19	1.19	3.303	49.435	.002
Specific risk/need total	1.39	1.65	2.44	2.05	2.771	95	.007 ^{†††}
Personal problems [†]	1.05	1.27	2.11	1.70	3.245	58.102	.002
History of perpetration ^{††}	0.34	0.75	0.33	0.59	-.075	95	.940
Strengths total	0.74	1.20	0.42	0.87	-1.519	90.560	.132

Table 27 (continued)

Community Recidivist (n=36)/Nonrecidivist (n=61) Comparisons on LSI-OR Scale's Variables

LSI-OR Variables	Nonrecidivists		Recidivists		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Other client issues	1.34	1.75	1.42	1.79	.195	95	.846
Special responsivity	0.30	0.59	0.94	0.83	4.139	56.074	.000

Note. [†] refers to Specific risk/need factors, personal problems. ^{††} refers to Specific risk/need factors, History of perpetration. ^{†††} Bonferroni correction = not significant.

LSI-OR risk levels and recidivism rates. In analyzing recidivism rates by four risk levels, 2 x 4 chi-square analyses were completed for all young offenders on general, violent and nonviolent recidivism, with recidivism being coded in a binary (yes-no) fashion. Further, comparisons of individual risk levels were conducted for the three types of recidivism by pairing risk levels and conducting six, 2x2 chi-square comparisons. These analyses were conducted on the total sample in order to determine which pairs of risk levels were significantly different from each other and then repeated on the custody and community samples.

With an alpha level of .05, it was found that general recidivists and nonrecidivists were distributed in a significantly different fashion across the four LSI-OR risk levels when both the initial and final risk levels were used, $\chi^2(3, 154) = 31.888, p < .001$, and $\chi^2 = (3, 154) = 26.377, p < .001$, respectively. Secondly, the distributions of nonviolent recidivists and nonrecidivists across the four risk levels differed significantly for both the initial and final risk levels, $\chi^2(3, 154) = 26.339, p < .001$, and $\chi^2(3, 154) = 23.974, p < .001$. Finally, the results also indicated

significant differences for violent recidivists and nonrecidivists, in their distribution across four risk levels, $\chi^2(3, 154) = 12.624, p < .01$ for initial risk, and $\chi^2(3, 154) = 9.362, p < .05$, for final risk. These results show a slightly stronger relationship for initial, rather than final, risk schedules across all three types of binary outcome variables (general, violent and nonviolent recidivism). Therefore, the initial (4-level) risk schedule is used to represent the LSI-OR risk levels in all future validity analyses (Table 28).

Figure 7 reflects a relationship between the LSI-OR four risk levels and (general, violent and nonviolent) recidivism for the total sample of young offenders ($N = 154$). Numerical values representing recidivism rates associated with specific risk levels are reported immediately below this figure. Figure 7 portrays a robust, positive linear relationship between the four risk levels and the three binary recidivism variables, including violent recidivism. As depicted in Figure 7, although there is a low base rate (20.1%) of violent recidivism in the current sample of 154 (Caucasian) male young offenders, the LSI-OR Scale's ability to predict general, nonviolent and violent recidivism rates is strong for all three types of recidivism.

Figures 8 and 9 represent relationship between the LSI-OR four risk levels and (general, violent, and nonviolent) recidivism for the custody and community offenders. Numerical values representing recidivism rates associated with the specific risk levels are reported immediately below the respective figures. Custody-community comparisons on the percentage of their recidivists and nonrecidivists (2×2 chi-squares) indicated a significant difference between these two groups on all three types of (general, violent, and nonviolent) recidivism. For general recidivism, the custody and community groups significantly differed on the proportion of offenders who recidivated and those who did not recidivate, $\chi^2(1, 154) = 19.210, p < .001$. For nonviolent re-offending, the custody and community groups were significantly different in terms

of the proportion of their recidivists and nonrecidivists, $\chi^2(1, 154) = 17.067, p < .001$. For violent recidivism, with an alpha of .05, the custody and community groups were significantly different on the proportion of recidivists and nonrecidivists, $\chi^2(1, 154) = 3.549, p = .048$.

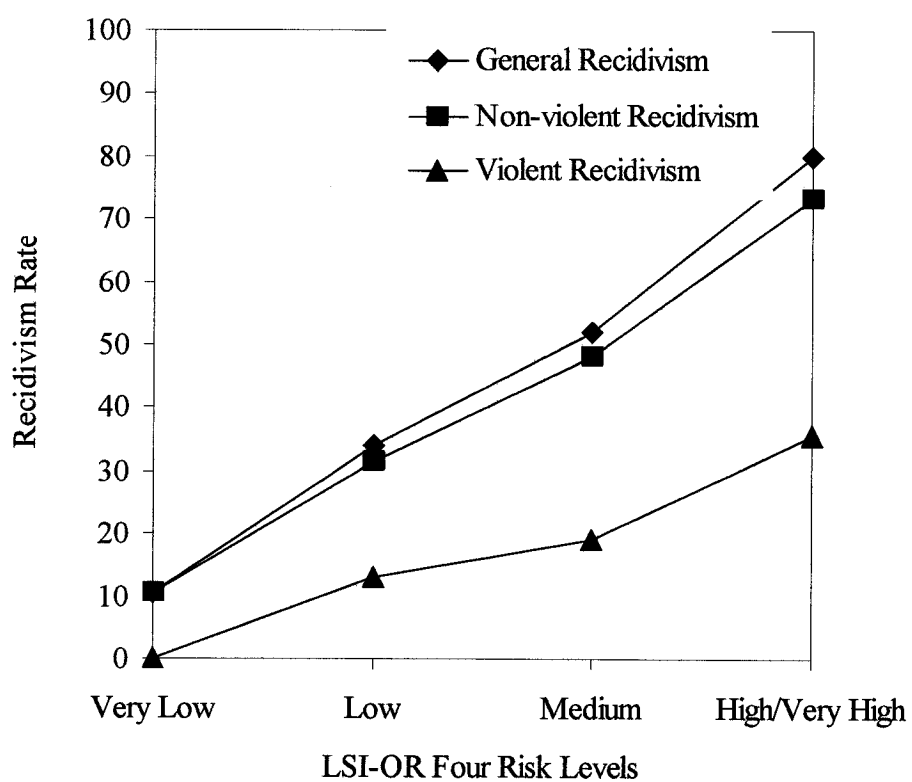


Figure 7. Total Sample ($N = 154$): General, nonviolent, and violent recidivism rates (percentage of recidivists within the very low, low, medium, and high/very high risk groups).

As presented in Figure 7, from very low to high/very high-risk levels, the percentage values of general recidivism are: 10.5, 34.2, 51.9, and 80.0. The percentage values of nonviolent recidivism are: 10.5, 31.6, 48.1, and 73.3. The percentage values of violent recidivism are: 0.0, 13.2, 19.2, and 35.6.

Results from the overall (2 x 4) chi-square of risk level by recidivism status are presented in Table 28, along with the comparisons of recidivism percentage for the six possible pairs of risk levels. The overall (2 x 4) chi-square values show that the proportions of recidivists versus nonrecidivists are significantly different across the four risk levels and that the frequency (proportion) of general, nonviolent and violent recidivism is augmented with an increase of LSI-OR risk level, as predicted in the first hypothesis.

However, when individual risk levels are compared with one another, using paired risk level comparisons (i.e., six 2x2 chi square), the results are less straightforward. As presented in Table 28, with an alpha level of .05, the proportion of the general recidivists to nonrecidivists was not significantly different between the very low and low risk levels. However, there was a significant difference between the very low and medium risk levels, and between the very low and high/very high-risk levels as well. As for the low and medium risk levels, they were not significantly different from each other. However, the difference was significant between the low and high/very high levels, and between medium and high/very high-risk levels, for the general recidivism category.

The proportion of the nonviolent recidivists to nonrecidivists was not significantly different between the very low and low risk levels. However, there was a significant difference between the very low and medium risk levels and between the very low and high/very high-risk levels as well. As for the low and medium risk levels, they were not significantly different from

each other. However, the difference was significant between the low and high/very high levels, and between medium and high/very high-risk levels, for the nonviolent recidivism category.

The proportion of the violent recidivists to nonrecidivists was not significantly different between the very low and low risk levels. However, there was a significant difference between the very low and medium risk levels and between the very low and high/very high-risk levels as well. As for the low and medium risk levels, they were not significantly different from each other, although there was a significant difference between the low and high/very high levels. The difference between the medium and high/very high-risk levels was not significant for the violent recidivism category.

Table 28

Total Sample (N = 154): 2x2 Chi Square Values (p value in brackets) for Comparisons of Risk Level by Recidivism with 1 (df) and Overall Chi Square Value with 3 (df)

Recidivism	Pairs of risk level						Overall levels
	VL vs. L	VL vs. M	VL vs. H/V	L vs. M	L vs. H/V	M vs. H/V	$\chi^2(3)$
General	3.66	9.87	26.73	2.79	17.86	8.35	31.89
	(.056)	(.002)	(.000)	(.095)	(.000)	(.004)	(.000)
Nonviolent	3.03	8.33	21.27	2.47	14.47	6.40	26.34
	(.082)	(.004)	(.000)	(.116)	(.000)	(.011)	(.000)
Violent	2.74	4.25	9.01	0.58	5.47	3.28	12.62
	(.098)	(.039)	(.003)	(.445)	(.019)	(.070)	(.006)

Note. VL vs. L = very low versus low; VL vs. M = very low versus medium; VL vs. H/V = very low versus high and very high (merged); L vs. M = low versus medium; L vs. H/V = low versus high and very high (merged); M vs. H/V = medium versus high and very high (merged).

Figure 8 reflects a relationship between the LSI-OR four risk levels and (general, nonviolent, and violent) recidivism for the custody participants ($N = 57$). It portrays an unstable, non-linear relationship between the risk levels and the binary recidivism variables, including general, nonviolent and violent recidivism. As depicted in Figure 8, there were no custody offenders assigned to the very low risk level, and so that there are only three levels of risk presented for the custody sample.

Regarding young offenders in custody, it was found (Table 29) that general recidivists and nonrecidivists were not distributed in a significantly different fashion across the three LSI-OR (initial) risk levels, $\chi^2(2, 57) = 4.725, p = .094$. Secondly, the distributions of nonviolent recidivists and nonrecidivists across the three risk levels did not differ significantly, $\chi^2(2, 57) = 4.809, p = .090$. Finally, the results also indicated lack of significant differences for violent recidivists and nonrecidivists, in their distribution across three risk levels, $\chi^2(2, 57) = 1.852, p = .396$. In summary, contrary to the first hypothesis, there was no significant difference in the proportion of custody offenders who recidivated versus those who did not recidivate at each LSI-OR risk level.

Figure 8 clearly portrays that the low-risk custody offenders recidivated at a higher rate than those who were assigned to the medium-risk level. It means that the LSI-OR Scale is void of ability to predict general, nonviolent and violent recidivism rates, relative to its increasing risk levels, for the custody young offenders.

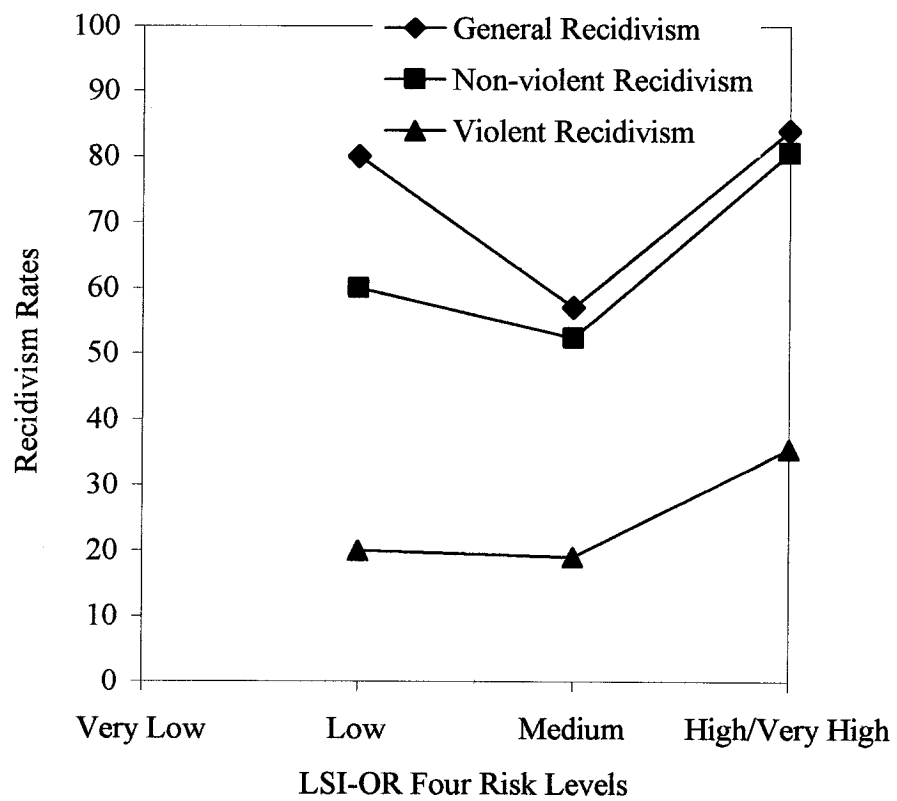


Figure 8. Custody Sample ($N = 57$): General, nonviolent, and violent recidivism rates (percentage of recidivists within the risk group) across four LSI-OR risk levels.

As presented in Figure 8, there are no offenders in the very low risk category. From the very low, through medium, to the high/very high-risk levels, the percentage values of general recidivism are: 80.0, 57.1, and 83.9. The percentage values of nonviolent recidivism are: 60.0, 52.4, and 80.6. The percentage values of violent recidivism are: 20.0, 19.0, and 35.5.

When individual risk levels are compared with one another using paired risk level comparisons (three 2x2 chi squares), the results are less strait forward. Table 29 shows that, with an alpha level of .05, the proportion of the general recidivists to nonrecidivists was not significantly different between the low and medium risk levels, and between the low and high/very high-risk levels as well. However, for the general recidivism category, the difference was significant between the medium and high/very high-risk levels.

The proportion of the nonviolent recidivists to nonrecidivists was not significantly different between the low and medium risk levels, and between the low and high/very high-risk levels as well. However, for the nonviolent recidivism category, the difference was significant between the medium and high/very high levels.

The proportion of the violent recidivists to nonrecidivists was not significantly different between the low and medium risk levels. Also, there were no significant differences between the low and high/very high-risk levels and between the medium and high/very high-risk levels, for the violent recidivism category.

Table 29

Custody Sample (n=57): 2x2 Chi Square Values (p value in brackets) for Comparisons of Risk Level by Recidivism with 1 (df) and Overall Chi Square with 2 (df)

Recidivism	Pairs of risk level			Overall levels
	L vs. M	L vs. H/V	M vs. H/V	$\chi^2(2)$
General	0.89(.345)	0.05(.829)	4.55(.033)	4.73(.094)
Non-violent	0.09(.759)	1.06(.303)	4.70(.030)	4.81(.090)
Violent	0.002(.961)	0.47(.496)	1.65(.199)	1.85(.396)

Note. No custody participants are in the very low risk category. L vs. M = low versus medium; L vs. H/V = low versus high and very high (merged); M vs. H/V = medium versus high and very high (merged).

Figure 9 reflects a relationship between the LSI-OR risk levels and (general, violent and nonviolent) recidivism for young offenders placed in the community ($n = 97$). It portrays a robust, positive linear relationship between the four risk levels and the three binary recidivism variables, including violent recidivism. As depicted in Figure 9, although there is a low base rate of violence (15.5%) in the current community sample of 97 (Caucasian male) young northern offenders, the LSI-OR Scale's ability to predict general, nonviolent and violent recidivism rates, relative to its four risk levels, is strong for all three types of recidivism, including violence.

With an alpha level of .05, it was found (Table 30) that general recidivists and nonrecidivists from the community were distributed in a significantly different fashion across the four LSI-OR risk levels when the (initial) risk was used, $\chi^2(3, 97) = 15.875, p = .001$. Secondly,

the distributions of nonviolent recidivists and nonrecidivists across the four risk levels also differed significantly, $\chi^2(3, 97) = 10.390, p = .016$. Finally, the results also indicated significant differences for violent recidivists and nonrecidivists, in their distribution across four risk levels, $\chi^2(3, 97) = 8.508, p = .037$, for initial risk.

In summary, Figure 9 reveals percentage of community ($n = 97$) recidivists across four levels of LSI-OR risk system, showing that there were significantly different proportions of recidivists across these four risk levels and that the frequency (proportion) of general, nonviolent and violent recidivism was augmented with an increase of LSI-OR risk level, as expected. Thus, the community young male offenders benefited from the LSI-OR risk classification, aimed at distinguishing between recidivists and nonrecidivists, in accordance with the initial hypothesis that there will be significant increases in recidivism rates observed alongside increasing risk levels.

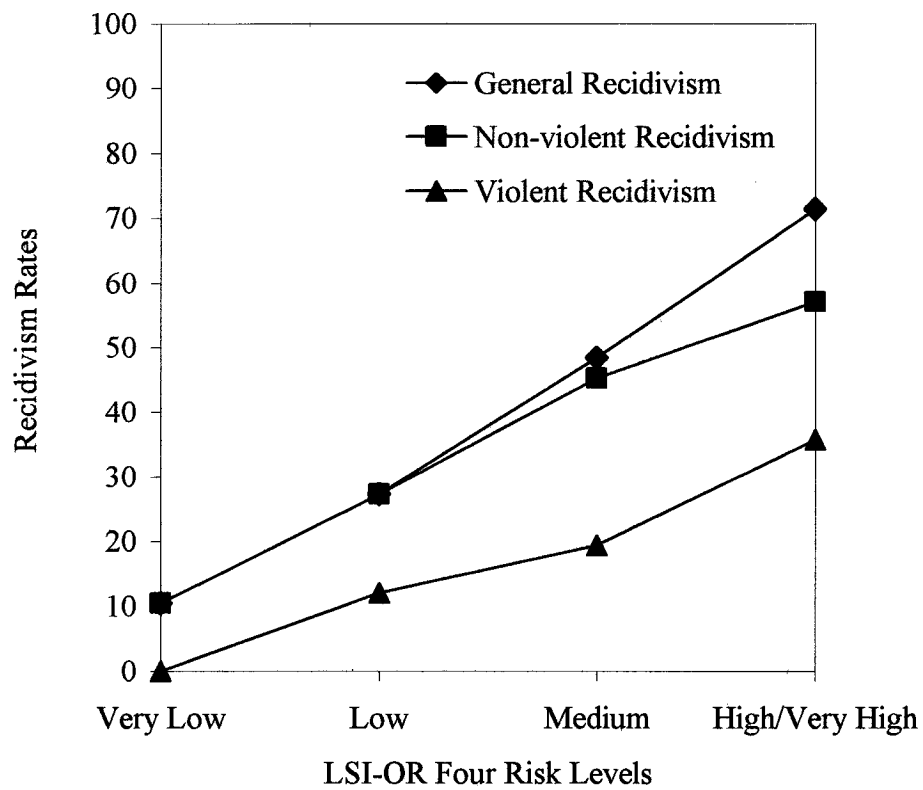


Figure 9. Community Sample ($N = 97$): General, nonviolent, and violent recidivism rates (percentage of recidivists within the risk group) across four LSI-OR risk levels.

As presented in Figure 9, from very low to high/very high-risk levels, the percentage values of general recidivism are: 10.5, 27.3, 48.4, and 71.4. The percentage values of nonviolent recidivism are: 10.5, 27.3, 45.2, and 57.1. The percentage values of violent recidivism are: 0.0, 12.1, 19.4, and 35.7.

However, when individual risk levels are compared with one another, using paired risk level (six 2 x 2 chi square) comparisons, the results are less straightforward. As presented in Table 30, with an alpha level of .05, the proportion of the general recidivists to nonrecidivists was not significantly different between the very low and low risk levels. However, there was a significant difference between the very low and medium risk levels, and between the very low and high/very high-risk levels as well. As for the low and medium risk levels, they were not significantly different from each other. However, the difference was significant between the low and high/very high levels, but it was not significant between medium and high/very high-risk levels, for the general recidivism category.

The proportion of the nonviolent recidivists to nonrecidivists was not significantly different between the very low and low risk levels. However, there was a significant difference between the very low and medium risk levels and between the very low and high/very high-risk levels as well. As for the low and medium risk levels, they were not significantly different from each other. The difference approached significance ($p = .051$) between the low and high/very high levels, but it was not significant between medium and high/very high-risk levels, for the nonviolent recidivism category.

The proportion of the violent recidivists to nonrecidivists was not significantly different between the very low and low risk levels. However, there was a significant difference between the very low and medium risk levels and between the very low and high/very high-risk levels as

well. As for the low and medium risk levels, they were not significantly different from each other, as were not the low and high/very high levels. Further, the difference between the medium and high/very high-risk levels was not significant for the violent recidivism category in community offenders.

Table 30

Community Sample (N = 97): 2x2 Chi Square Values (p value in brackets) for Comparisons of Risk Level by Recidivism with 1 (df) and Overall Chi Square Value with 3 (df)

Recidivism	Pairs of risk level						Overall levels
	VL vs. L	VL vs. M	VLvs.H/V	L vs. M	L vs. H/V	M vs. H/V	$\chi^2(3)$
General	2.03	7.53	12.92	3.04	7.96	2.07	15.88
	(.154)	(.006)	(.000)	(.081)	(.005)	(.150)	(.001)
Nonviolent	2.03	6.49	8.29	2.22	3.80	0.55	10.39
	(.154)	(.011)	(.004)	(.136)	(.051)	(.457)	(.016)
Violent	2.50	4.18	8.00	0.63	3.53	1.40	8.51
	(.114)	(.041)	(.005)	(.426)	(.060)	(.237)	(.037)

Note. VL vs. L = very low versus low; VL vs. M = very low versus medium; VL vs. H/V = very low versus high and very high (merged); L vs. M = low versus medium; L vs. H/V = low versus high and very high (merged); M vs. H/V = medium versus high and very high (merged).

Outcome variable intercorrelations. A number of Pearson intercorrelations among the outcome variables were produced for the combined young offender sample, the institutional (custody) and probation (community) subsamples. These intercorrelations can be found in Appendix E, Tables E1 through E3.

Table E1 shows that, for the total sample of 154, most of the recidivism variables are significantly associated at the .001 alpha level, and in the desired direction, except for the number of conditional sentences, outstanding charges, and number of suspended sentences, which produced insignificant correlations with some recidivism variables.

In Appendix E, Tables E1-E3, the associations between the selected recidivism variables are depicted for location (custody and community). These Tables replicate significant associations between recidivism variables, showing areas of high and weak associations. For different subgroups, different areas of high and weak associations are observed.

Correlations between LSI-OR and recidivism. In order to examine the relationship between the various components of the LSI-OR and recidivism, the correlations between the predictor and criterion variables were presented in Table 31. Selected LSI-OR variables, including section and subscale scores, and the two derived factors (Static and Dynamic), were correlated with the binary measures (yes-no) of general, nonviolent, and violent recidivism, and with the number of convictions and the number of charges for the total young offender sample ($N = 154$). The same correlation matrices were then presented for the custody and community groups, separately, in Tables 32 and 33. Correlations with a number of additional (continuous) recidivism variables are available in Appendix F (Table F1, for the total sample, and Tables F2 and F3, for custody and community groups, respectively).

As presented in Table 31 (for the total YO Sample), the General risk/need factor (Section A) score consistently performed better than the Specific risk/need factor (Section B) score, including the case of violent recidivism. The General risk/need factor score was associated most strongly with the binary General recidivism variable ($r = .46, p < .001$). Considering the General risk/need factor section's eight subsections, all of them evidenced robust associations with the existing recidivism variables, except for the Family/marital (A3) subsection, which showed somewhat weaker associations with general and nonviolent (yes-no) recidivism ($r = .19, r = .21, p < .05$, respectively) and no associations with violent recidivism and with the number of convictions and the number of charges' recidivism variables.

The LSI-OR instrument's two factors, Static and Dynamic, showed very respectable associations with the binary recidivism variables. With general recidivism, these LSI-OR variables' associations were as follows, $r = .44$ and $r = .37, p < .001$, with nonviolent recidivism, $r = .42$ and $r = .36, p < .001$, also showing robust and equal associations with violent recidivism, $r = .23$ and $r = .24, p < .001$, respectively.

Regarding performance of other LSI-OR Sections, such as Section C (Prison experience), Section F (Other client issues), and Section G (Responsivity considerations), in reflection of their association with the existing recidivism variables, the latter (Section G) outperforms other LSI-OR Sections. Surprisingly, the Responsivity considerations (Section G) shows stronger associations with general, nonviolent, violent recidivism, as well as various continuous recidivism variables, than does the LSI-OR Special risk/needs factors (Section B). Also unexpectedly, the Other client issues, Institutional factors (i.e., prison experience), and Strengths total, perform very poorly in terms of their relationship with the variety of recidivism variables in

the current sample of 154 (Caucasian male) young offenders from Northern Ontario, showing lack of such an association.

Finally, the predictor-outcome correlations indicate that the number of charges variable has a somewhat stronger relationship with the LSI-OR Scale than does the number of convictions variable. Also, there are other important recidivism variables, such as number of recidivistic events (sets) and the number of recidivism types (diversity) that are valuable in representing young offenders' recidivism construct (Appendix F).

Table 31

Total Sample (N=154): Pearson Correlations Between LSI-OR Sections, Subscales, Derived (Static and Dynamic) Factor Scores and Five Selected Recidivism Variables

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	Number convictions ²	Number charges ²
General risk/need fact (A)	.46***	.43***	.31***	.41***	.42***
Criminal history (A1)	.43***	.41***	.26***	.42***	.42***
Education/employ. (A2)	.33***	.28**	.29***	.27**	.28**
Family/marital (A3)	.19*	.21*	.05	.14	.14
Leisure/recreation (A4)	.34***	.35***	.12	.28***	.30***
Companions (A5)	.24**	.21**	.18*	.24**	.24**
Procriminal attitudes (A6)	.24**	.24**	.24**	.16	.21*
Substance abuse (A7)	.23**	.21**	.13	.21**	.22**
Antisocial pattern (A8)	.31***	.27**	.20*	.27**	.30***
Static Factor (1)	.44***	.42***	.23***	.43***	.43***
Dynamic Factor (2)	.37***	.36***	.24**	.30***	.33***
Initial risk 4-level (D1)	.45***	.41***	.28***	.38***	.40***
Final risk 4-level (D2)	.39***	.37***	.23**	.36***	.37***

Table 31 (continued)

Total Sample (N=154): Pearson Correlations Between LSI-OR Sections, Subscales, Derived (Static and Dynamic) Factor Scores and Five Selected Recidivism Variables

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	Number convictions ²	Number charges ²
Specific risk/need (B)	.24**	.19*	.28***	.18*	.19*
Personal problems (B1)	.24**	.20*	.31***	.17*	.19*
History of perpetrat. (B2)	.11	.08	.09	.11	.08
Institutional factors (C)	.05	-.04	.05	-.04	-.05
Other client issues (F)	.14	.16*	.05	.04	.06
Responsivity (G)	.35***	.30***	.24**	.22**	.23**
Strengths total (D3)	-.04	-.05	-.05	-.07	-.09

Note. ¹ binary (1-0) recidivism variable. ² continuous recidivism variable. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 32 shows the LSI-OR variables' associations with the selected five recidivism variables for the custody group ($n = 57$). In general, it indicates uncharacteristically low levels of such associations. The General risk/need factor section shows significant associations only with two outcome variables, the number of convictions and the number of charges, ($p < .05$), but demonstrates no such associations with the three binary recidivism variables. Among the subscales, Criminal history is significantly correlated with (binary) general and nonviolent recidivism, as well as the number of convictions and charges' outcome variables. However,

neither Section A nor its Criminal history subscale is significantly correlated with the (binary) violent recidivism. Moreover, no other Section A's subscales are significantly associated with any of the recidivism variables, except for the Companions subscale, which correlates with the number of convictions and charges ($p < .05$).

Substantiating the significance of the relationship between historic factors and recidivism of the youth placed in custody, the Static LSI-OR factor performs much better than the Dynamic LSI-OR factor in this group of young offenders. More specifically, the Static LSI-OR factor is strongly and significantly associated with the number of convictions and the number of charges variables ($r = .41$, $r = .38$, $p < .01$, respectively), as well as with the binary nonviolent and general recidivism variables ($r = .35$, $p < .01$ and $r = .32$, $p < .05$, respectively), whereas the Dynamic LSI-OR factor does not show significant associations with neither of these recidivism variables.

In descending order, regarding the strength and significance of their association with the outcome (recidivism) variables, the Static LSI-OR factor score is followed by the Criminal history subscale, by the final and initial LSI-OR risk variables, by the General risk/need factors (Section A) and, finally, by the Companions subscale. The strength and significance of these rather weak predictor–outcome correlations can be inspected by viewing the Tables 32 and F2 (Appendix F), indicative of lack of a relationship between the majority of the LSI-OR variables and later recidivism of young offenders who were placed in custody ($n = 57$).

Table 32

Custody Sample (n=57): Pearson Correlations Between LSI-OR Sections, Subsections, Derived (Static and Dynamic) Factor Scores and Five Selected Recidivism Variables

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	Number convictions ²	Number charges ²
General risk/need fact (A)	.16	.25	.19	.27*	.30*
Criminal history (A1)	.31*	.34**	.18	.37**	.34*
Education/employ. (A2)	.05	.09	.12	.11	.12
Family/marital (A3)	.15	.23	-.06	.08	.10
Leisure/recreation (A4)	-.01	.16	-.12	.14	.20
Companions (A5)	.18	.20	.18	.31*	.32*
Procriminal attitudes (A6)	.10	.13	.24	-.01	.04
Substance abuse (A7)	-.06	-.00	.11	.07	.10
Antisocial pattern (A8)	-.09	-.05	-.01	.05	.09
Static Factor (1)	.32*	.35**	.17	.41**	.38**
Dynamic Factor (2)	.04	.16	.12	.09	.15
Initial risk 4-level (D1)	.17	.24	.16	.29*	.32*
Final risk 4-level (D2)	.16	.29*	.05	.33*	.34*

Table 32. (continued)

Custody Sample (n=57): Pearson Correlations Between LSI-OR Sections, Subsections, Derived (Static and Dynamic) Factor Scores and Five Selected Recidivism Variables

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	Number convictions ²	Number charges ²
Specific risk/need (B)	-.13	-.13	.21	-.09	-.09
Personal problems (B1)	-.21	-.19	.19	-.15	-.13
History of perpetrat. (B2)	.07	.04	.11	.07	.03
Institutional factors (C)	.11	-.08	.09	-.09	-.10
Other client issues (F)	.20	.24	.15	-.01	.02
Responsivity (G)	.11	.13	.03	.05	.03
Strengths total (D3)	-.03	-.09	-.04	-.16	-.16

Note. ¹ binary (1-0) recidivism variable. ² continuous recidivism variable. * $p < .05$. ** $p < .01$.

Table 33 shows the LSI-OR variables' associations with the selected five recidivism variables for the community group ($n = 97$). In general, with an alpha level of .05, there are high levels of such associations for the majority of the LSI-OR variables.

Specifically, the General risk/need factors (Section A) performs very well and consistently outperforms the Specific risk/need factors (Section B) score, including the case of violent recidivism. The General risk/need factor section's score is especially strongly associated with the binary general recidivism variable ($r = .44, p < .001$), while the Specific risk/need factor

section's highest association is with the binary (yes-no) violent recidivism ($r = .28, p < .01$). The General risk/need factors scale eight subsections' performance is, generally, very robust, except for its three subscales, Family/marital, Companions, and Substance abuse.

Both the Static and Dynamic LSI-OR factors perform well in terms of their highly significant associations with the existing recidivism variables for the community offenders. In addition to the binary general and nonviolent recidivism, as well as the number of convictions and the number of charges, the Dynamic LSI-OR factor correlates robustly with violent recidivism ($r = .27, p < .01$), whereas the Static LSI-OR factor's relationship with the violent recidivism is not significant for this group.

In descending order, regarding the strength and significance of their association with the outcome (recidivism) variable, the Leisure/recreation subscale and the General risk/need factor section, are the two leading variables. These are followed by the LSI-OR Responsivity considerations (Section G), initial risk, Education/employment and by derived LSI-OR Dynamic factor variables, which go hand in hand. The Antisocial patterns subscale, final LSI-OR risk, Static LSI-OR factor and Criminal history subscale are also all significantly associated with the select recidivism variables as are the Personal problems subscale and, importantly, Specific risk/needs factors (Section B). Strength and significance of these predictor–outcome correlations can be inspected by viewing the Tables 33 and F3 (Appendix F), indicative of a significant relationship between the majority of these LSI-OR variables and later recidivism of young offenders placed in community ($n = 97$).

Regarding performance of other LSI-OR Sections, such as Section C (Prison experience), Section F (Other client issues), and Section G (Other responsivity considerations), in reflection of their association with the existing recidivism variables, the latter (Section G) outperforms the

other two sections. Surprisingly, the Responsivity considerations (Section G) shows stronger associations with general, nonviolent, violent recidivism, as well as various continuous recidivism variables, than does the LSI-OR Special risk/needs factors (Section B). Also unexpectedly, the Other client issues, Institutional factors (i.e., prison experience), and Strengths total, perform very poorly in terms of their relationship with the variety of recidivism variables in the current community sub-sample of 97 (Caucasian male) young offenders from Northern Ontario, showing lack of such an association.

Table 33

Community Sample (n=97): Pearson Correlations Between LSI-OR Sections, Subsections, Derived (Static and Dynamic) Factor Scores and Five Selected Recidivism Variables

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	Number convictions ²	Number charges ²
General risk/need fact (A)	.44***	.35***	.33**	.36***	.39***
Criminal history (A1)	.30**	.24*	.24*	.26**	.31**
Education/employ. (A2)	.39***	.30**	.37***	.33**	.35**
Family/marital (A3)	.11	.11	.06	.09	.07
Leisure/recreation (A4)	.45***	.40***	.25*	.35**	.35**
Companions (A5)	.17	.11	.12	.07	.08
Procriminal attitudes (A6)	.22*	.21*	.18	.21*	.26**
Substance abuse (A7)	.21*	.16	.07	.16	.16
Antisocial pattern (A8)	.36***	.28**	.29**	.30**	.33**
Static Factor (1)	.32**	.27**	.19	.26**	.30**
Dynamic Factor (2)	.39***	.33**	.27**	.32**	.34**
Initial risk 4-level (D1)	.40***	.33**	.29**	.31**	.35***
Final risk 4-level (D2)	.32**	.25*	.27**	.25*	.28**

Table 33. (continued)

Community Sample (n=97): Pearson Correlations Between LSI-OR Sections, Subsections, Derived (Static and Dynamic) Factor Scores and Five Selected Recidivism Variables

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	Number convictions ²	Number charges ²
Specific risk/need (B)	.27**	.21*	.28**	.26*	.27**
Personal problems (B1)	.34**	.28**	.34**	.31**	.34**
History of perpetr. (B2)	-.01	-.04	-.00	.00	-.02
Other client issues (F)	.02	.03	-.06	-.02	-.00
Responsivity (G)	.42***	.33**	.38***	.31**	.34**
Strengths total (D3)	-.14	-.11	-.11	-.02	-.07

Note. ¹ binary (1-0) recidivism variable. ² continuous recidivism variable. * $p < .05$. ** $p < .01$. *** $p < .001$.

ROC method's estimate of the LSI-OR instrument's predictive power. In assessing the LSI-OR instrument's ability to predict risk level, derived from a priori cutoffs and dependent upon prevalence rates, the receiver operating characteristic (ROC) method was utilized. The ROC method does not provide the optimal cutoff value nor does illustrate how prevalence affects cutoff selection (Mossman & Somoza, 1989), but it provides an index of information value of the data, independent of cutoff value and prevalence (McFall & Treat, 1999). The axes of an ROC plot are the hit and false alarm rates, and each point on an ROC curve corresponds to a pair of hit and false alarm rates that result from the use of a specific cutoff value. In more traditional language, the ROC curve is a plot of sensitivity against 1 minus specificity at all possible cutoff values (McFall & Treat, 1999). Presently, the area under the ROC curve (AUC) is the preferred signal detection theory's accuracy index, because nonparametric procedures are available for estimating AUC and many users prefer a proportion-based, rather than a distance-based, measure of accuracy.

A ROC curve that lies on the main diagonal indicates that the diagnostic system is operating at the level of chance, the hit and false alarm rates being equal across the range of possible cutoff values. An AUC statistic can range from 0 (perfect negative prediction), to .50 (chance prediction), to 1.0 (perfect positive prediction). Large-sized AUCs may be considered to be above .70 (Douglas & Webster, 1999). AUC also has a readily interpretable probabilistic meaning: It corresponds to the probability that a randomly selected pair of observations drawn from the two underlying distributions will be ranked (classified) correctly (McFall & Treat, 1999). Several AUC values are depicted in Tables 34, 35, 36. Consistent with criminological prediction research, it was general/violent/nonviolent recidivism that was viewed as an outcome, examined in a binary, 'yes-no,' format (Wormith, 2001).

In Table 34, for the total sample of young offenders, ROC analyses and the areas under the curves (*AUC*) they yield, indicate a variety of effects between the LSI-OR and later general, violent and nonviolent (yes-no) offending. Like elsewhere in the study, an alpha level of .05 was used for the statistical tests relevant to this section. Most of the LSI-OR variables are significant and demonstrate a positive predictive power (*AUC* values $> .50$). For the majority of these predictor variables, *AUC* values show moderate to large-sized effects with general recidivism. Values of *AUC* average in the .66 area, ranging from .44 for Strengths total, .51 for Section C ($p > .05$) and reaching .77 for Section A ($p < .001$).

With general recidivism, the LSI-OR Section A, its two factors, Dynamic and Static, as well as its initial and final (4-level) risk schedules, produce large-sized effects (*AUCs* $> .70$, $p < .001$). In accord with the previously reported correlational validities, Section G produces moderate to large-sized effect with general recidivism (*AUC* = .68, $p < .001$), outperforming Section B (*AUC* = .64, $p < .01$, moderate predictive power) and Section F (*AUC* = .59, $p < .05$, low to moderate predictive power). Finally, Section C demonstrates low predictive power for general recidivism and Strengths do not show predictive power, both not meet the required significance criterion, ($p < .05$), showing that they cannot be relied upon for their diagnostic accuracy.

As for violent (yes-no) recidivism of all the young offenders, ROC analyses and the areas under the curves (*AUC*) they yield, indicate mostly moderate-sized effects between the LSI-OR and violent recidivism. All the LSI-OR variables demonstrate a positive predictive power (*AUC* values $> .50$) and, for the most part, are highly significant. Values of *AUC* average in the .63 area ranging from .43 for Strengths, .51 for Section C ($p > .05$), and reaching .72 for Section A ($p < .001$).

Sections A and B demonstrate a high diagnostic power ($AUCs > .70, p < .001$) in prediction of (yes-no) violent recidivism. Following them, in descending order, are the LSI-OR variables exhibiting a moderate power to predict violent recidivism, such as the two LSI-OR derived factors, Static and Dynamic, initial and final risk schedules, as well as Section G (AUC values from .66 to .69, $p < .05$). Finally, Section C demonstrates low predictive power for violent recidivism and Strengths do not show it, both not meeting the required significance criterion, $p < .05$, showing that they cannot be relied upon for their diagnostic accuracy in prediction of future violent (yes-no) criminal involvement of the (Caucasian male) young offenders from Northern Ontario.

In Table 34, ROC analyses and the areas under the curves (AUC) they yield, also indicate moderate and large-sized effects between the LSI-OR and nonviolent recidivism. Most of the LSI-OR variables demonstrate a positive and highly significant power to predict nonviolent recidivism, their values of AUC averaging in the .65 area. They range from .44 for Strengths total, .50 for Section C ($p > .05$) and reach .75 for Section A ($p < .001$).

The LSI-OR Section A, its two factors, Static and Dynamic, as well as its initial and final (4-level) risk schedules, all produce large-sized effects with general recidivism ($AUC > .70, p < .001$). In accord with the previously reported correlational validities, Section G produces robust moderate-sized effect with nonviolent recidivism ($AUC = .65, p < .01$), outperforming Section B ($AUC = .62, p < .05$) and Section F ($AUC = .60, p < .05$), both of moderate-sized diagnostic accuracy. Finally, Strengths and Section C variables demonstrate a lack of, or a low positive predictive power for nonviolent recidivism, which did not meet the significance criteria at an alpha level of .05. Thus, they cannot be relied upon for their diagnostic (predictive) accuracy

regarding the assignments of (Caucasian male) young northern offenders to (yes-no) nonviolent recidivism categories.

Table 34

Total Sample (N=154): ROC Method's Estimate of LSI-OR's Predictive Power for General, Violent, and Nonviolent Recidivism (Yes-No)

LSI-OR variables	Area Under Curve (AUC)		
	General Recidivism	Violent Recidivism	Nonviolent Recidivism
General risk/need factors (A)	.77 ^{***}	.72 ^{***}	.75 ^{***}
Static LSI-OR factor	.76 ^{***}	.69 ^{**}	.74 ^{***}
Dynamic LSI-OR factor	.73 ^{***}	.69 ^{**}	.72 ^{***}
Initial risk (four levels)	.75 ^{***}	.69 ^{**}	.73 ^{***}
Final risk (four levels)	.72 ^{***}	.67 ^{**}	.71 ^{***}
Specific risk/need factors (B)	.64 ^{**}	.71 ^{***}	.62 [*]
Institutional factors ©	.51	.51	.50
Other client issues (F)	.59 [*]	.55	.60 [*]
Responsivity considerations (G)	.68 ^{***}	.66 ^{**}	.65 ^{**}
Strengths total	.44	.43	.44

Note. Chance performance corresponds to the Area Under the Curve (AUC) of 0.50. * $p < .05$. ** $p < .01$.

*** $p < .001$.

The next two Tables, 35 and 36, will present the LSI-OR variables' effect sizes (*AUCs*) with general, violent and nonviolent (yes-no) recidivism, for the custody and community offenders, respectively.

From reviewing Table 35, for custody youth ($n = 57$), one can see that ROC analyses and the *AUCs* they yield indicate two large-sized effects between the Static LSI-OR factor and general and nonviolent (yes-no) recidivism of youth in custody ($AUC = .72, p < .05, AUC = .73, p < .01$, respectively), yet the Static factor does not display power to predict (yes-no) violent recidivism of young offenders in custody. Other LSI-OR variables exhibit lack of diagnostic power to predict general, violent and nonviolent recidivism of young offenders in custody, their *AUC* values not meeting the expected ($p < .05$) significance criterion. These ROC analyses' findings are indicative of the LSI-OR instrument's limited diagnostic power in predicting all three types of recidivism of youth placed in custody, consistent with the previously reported chi-square and correlational validity results.

Table 35

Custody Sample (n=57): ROC Method's Estimate of LSI-OR Predictive Power for General, Violent and Nonviolent Recidivism (Yes/No)

LSI-OR variables	Area Under Curve (AUC)		
	General Recidivism	Violent Recidivism	Nonviolent Recidivism
General risk/need factors (A)	.62	.61	.66
Static LSI-OR factor	.72 [*]	.63	.73 ^{**}
Dynamic LSI-OR factor	.53	.57	.59
Initial risk (four levels)	.62	.60	.65
Final risk (four levels)	.62	.56	.66
Specific risk/need factors (B)	.42	.64	.43
Institutional factors ©	.52	.52	.49
Other client issues (F)	.63	.58	.64
Responsivity considerations (G)	.56	.52	.56
Strengths total	.41	.45	.38

Note. Chance performance corresponds to the Area Under the Curve (AUC) of 0.50. ^{*} $p < .05$. ^{**} $p < .01$.

^{***} $p < .001$.

From reviewing Table 36, for community youth ($n = 97$), one can see that ROC analyses and the *AUCs* they yield indicate large-sized effects between the LSI-OR variables and general, violent and nonviolent (yes-no) recidivism of these youth (*AUCs* from .71, $p < .01$, to .76, $p < .001$, respectively). These strong effects are, in descending order, produced by the following LSI-OR variables, the General risk/need factor (Section A), Dynamic LSI-OR factor, initial risk, and Responsivity considerations (Section G). The existing effects between the LSI-OR Section A and general and violent recidivism are equally strong for the community offenders. In harmony with the previously reported correlational findings, Section G ($AUC > .70$, $p < .01$) exhibits a high diagnostic power and outperforms Section B ($AUC < .70$, $p < .01$) in prediction of general and nonviolent recidivism of youth in the community. However, they both perform with a similarly high diagnostic power in prediction of violent recidivism ($AUC > .70$, $p < .01$), power equal in strength and significance level to that of Section A with violent recidivism.

Regarding the remaining LSI-OR variables, its Static factor and final risk, they show moderate to high diagnostic accuracy when it comes to predicting general, violent and nonviolent (yes-no) recidivism of community youth, whereas Section F and Strengths total do not meet the required significance criterion ($p > .05$, for all three types of recidivism) and, thus, cannot be relied upon when it comes to prediction of the future criminal activity for (Caucasian male) northern community youth.

Table 36

Community Sample (n=97): ROC Method's Estimate of LSI-OR Predictive Power for General, Violent and Nonviolent Recidivism (Yes/No)

LSI-OR variables	Area Under Curve (AUC)		
	General Recidivism	Violent Recidivism	Nonviolent Recidivism
General risk/need factors (A)	.76 ^{***}	.76 ^{**}	.72 ^{**}
Static LSI-OR factor	.68 ^{**}	.68 [*]	.65 [*]
Dynamic LSI-OR factor	.75 ^{***}	.75 ^{**}	.71 ^{**}
Initial risk (four levels)	.73 ^{***}	.72 ^{**}	.69 ^{**}
Final risk (four levels)	.68 ^{**}	.70 [*]	.64 [*]
Specific risk/need factors (B)	.65 [*]	.74 ^{**}	.62 [*]
Other client issues ©	.51	.51	.51
Responsivity considerations (G)	.72 ^{***}	.75 ^{**}	.68 ^{**}
Strengths total	.44	.41	.45

Note. Chance performance corresponds to the Area Under the Curve (AUC) of 0.50. * $p < .05$. ** $p < .01$.

*** $p < .001$.

In summary, ROC analyses and their AUCs indicated a variety of significant effects between the LSI-OR variables and later offending for the entire (Caucasian male) young offender sample, and for those who were placed on probation (Community subsample). Notably, there were equally strong and significant AUC effects between LSI-OR Sections A, B, and G and violent recidivism for the entire sample of participants ($N = 154$) and for the community group ($n = 97$). As for the custody offenders ($n = 57$), with the exception of the AUC effect for the Static LSI-OR Factor with general and nonviolent recidivism, the other AUCs showed a lack of significant predictor-criterion effects.

Unexpectedly, Strengths Total as well as Sections C and F did not meet the significance criterion, their AUC values being smaller than required, below the chance performance ($AUC = .05$), and not meeting the required significance criterion ($p < .05$), for all three types of recidivism. Therefore, these variables cannot be relied upon when it comes to prediction of the future criminal activity for (Caucasian male) northern youth, whether they are incarcerated (in custody) or on probation (in the community).

Survival rates across LSI-OR risk levels for the entire YO sample. In this section, Survival Analyses were performed on the four LSI-OR risk groups (with the high and very high risk groups being collapsed into one group) and the appropriate statistical comparisons were made between them. These analyses were conducted separately on general, violent and non-violent recidivism as the outcome variable. The time period used for these Survival Analyses began on the release date for the custody offenders and on the date of LSI-OR Scale's administration for the community offenders. It ended on a common date (December, 2001) for all offenders when the CPIC records were obtained and examined for post-assessment (follow-up) criminal activity. The purpose of these survival analyses was to examine the rate of

reoffending and the speed at which those who reoffended did so and to compare the resulting survival curves of young offenders who were assigned to different LSI-OR risk groups.

Figure 10 presents a graphic output, showing plots with four cumulative survival curves, for each risk level in the LSI-OR four-level risk system, for general (yes-no) recidivism. The survival functions descend because the probability of survival decreases as the pool of survivors decreases (the number of recidivistic events increases). The mean survival time for the very low-risk level offenders was 1662 days ($CI = 1481, 1843, SE = 92$). The mean survival time for the low risk level offenders was 1212 days ($CI = 1028, 1397, SE = 94$). The mean survival time for the medium risk level offenders was 1039 days ($CI = 845, 1233, SE = 99$). The mean survival time for the high/very high-risk level offenders was 557 days ($CI = 406, 708, SE = 77$).

When alpha was set at .05, the nonparametric test of independence was highly significant ($Log Rank = 36.11, df=3, p < .0001$). It means that, including the non-recidivists' time to censor, the risk level differentiated between survival probabilities in that a higher risk level was associated with a lower survival probability, confirming the rates of survival as being inversely related to the LSI-OR risk levels, in accord with original hypothesis. Concurrently, except for the low and medium risk groups, the 95% confidence intervals for the mean survival time at each risk level did not overlap, indicating that these survival times were different from one another at the .05 level.

However, when further comparisons were made between each risk level, concerning the difference between the number of recidivistic (terminal events) at these levels, the Breslow (or generalized Wilcoxon) test's results indicated the following differences, based on the number of recidivistic (terminal) events at all time, a statistic calculated from the number at risk and the number of recidivistic events at each event time in the study (SPSS, 1999):

With an alpha level of .05, the high/very high-risk level survival function is significantly different from the moderate risk (*Breslow* = 7.14, $p < .001$), the low risk (*Breslow* = 18.78, $p < .0001$), and the very low risk survival functions (*Breslow* = 19.25, $p < .0001$). The moderate risk survival function is significantly different from the very low survival function (*Breslow* = 8.54, $p < .001$), but not significantly different from the low risk survival function (*Breslow* = 3.18, $p = .07$). Finally, the low risk survival function is not different from the very low risk (*Breslow* = 3.52, $p = .06$) survival function. These findings are generally consistent with, but not identical to the confidence interval comparisons on mean survival time, as overlap was revealed between the low and moderate risk levels.

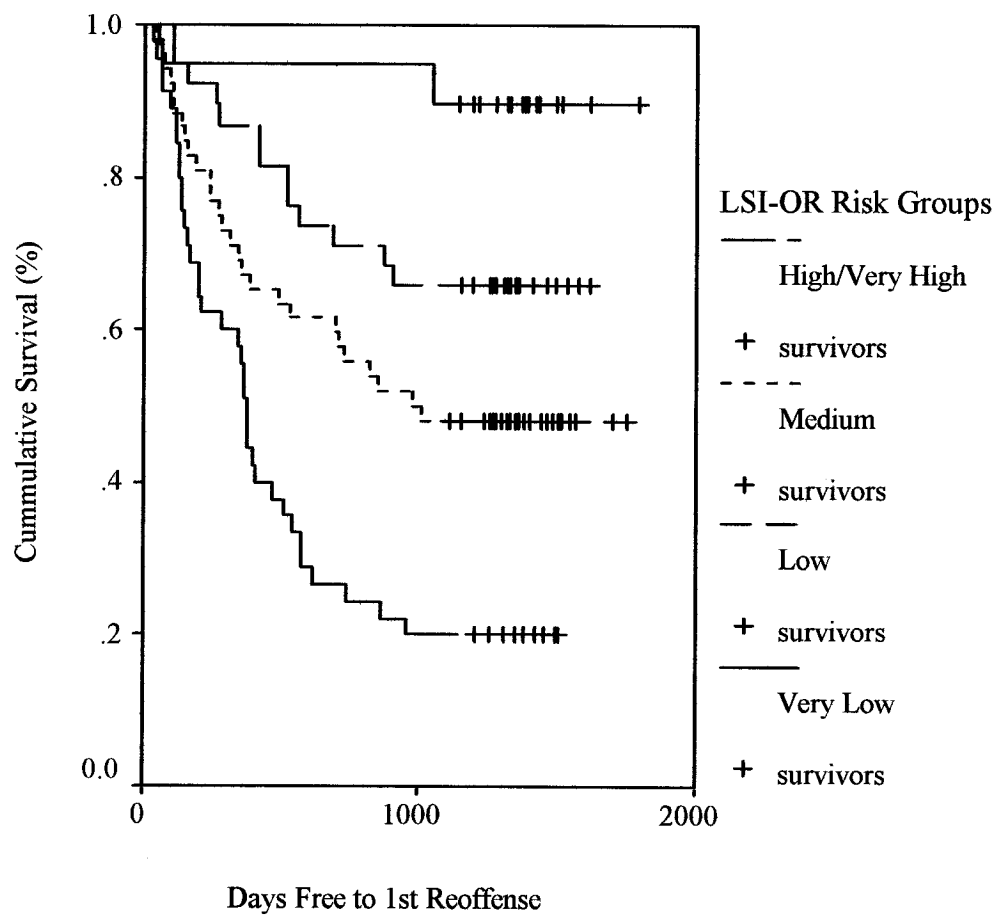


Figure 10. Survival to first (any) recidivism by the LSI-OR four risk groups ($N = 154$).

Figure 11 presents a graphic output, showing plots with four cumulative survival curves, for each LSI-OR risk level, with respect to violent (yes-no) recidivism. The survival functions descend because the probability of survival decreases as the pool of survivors decreases (the number of recidivistic events increases). The very low risk offenders all survived, (none of them violently recidivated), thus, their mean survival time equals their mean follow up time, which was 1391 days ($CI = 1313, 1468, SE = 37$). The mean survival time for the low risk level offenders was 1444 days ($CI = 1302, 1586, SE = 72$), the mean survival time for the moderate risk level offenders was 1435 days ($CI = 1263, 1608, SE = 88$), and the mean survival time for the high/very high-risk level offenders was 939 days ($CI = 732, 1147, SE = 106$).

When alpha was set at .05, the nonparametric test of independence was highly significant ($Log Rank = 20.43, df = 3, p < .0001$). It means that, including the non-recidivists' time to censor, the risk level differentiated between survival probabilities in that a higher risk level was associated with a lower survival probability. This confirms the rates of survival as being inversely related to the LSI-OR risk levels, in accord with original hypothesis.

The results obtained from the comparisons of the 95% confidence intervals for the mean survival time at each risk level indicate that, except for the moderate and high/very high levels, where confidence intervals did not overlap, their overlap was found between the very low and low, as well as low and moderate risk survival times, indicating that they are not significantly different from one another at the .05 level.

When further comparisons were made between each risk level, concerning the difference between the number of recidivistic (terminal events) at these levels, the Breslow (or generalized Wilcoxon) test's results indicated the following differences, based on the number of recidivistic

(terminal) events at all time, a statistic calculated from the number at risk and the number of recidivistic events at each event time in the study (SPSS, 1999):

With an alpha level of .05, the high/very high-risk level survival function is significantly different from the moderate risk function ($Breslow = 6.15, p < .05$), from the low ($Breslow = 8.53, p < .01$) and very low risk survival functions ($Breslow = 10.03, p < .01$). The moderate risk survival function is significantly different from the very low survival function ($Breslow = 4.93, p < .05$) but not from the low risk function ($Breslow = .82, p = .36$). Regarding the low risk survival function, it is not significantly different from the very low-level survival function ($Breslow = 2.88, p = .08$).

Very clearly, the high/very high group is different from all other risk groups on both analyses (i.e., mean survival time confidence intervals and Breslow statistic). However, the moderate and low risk groups are not different on either comparison, the low and the very low groups are not different on either comparison, and the moderate and very low groups are different on the Breslow comparisons, although their mean survival time CI's overlap (i.e., the moderate risk group's CI's entirely encompass CI's for the very low risk group).

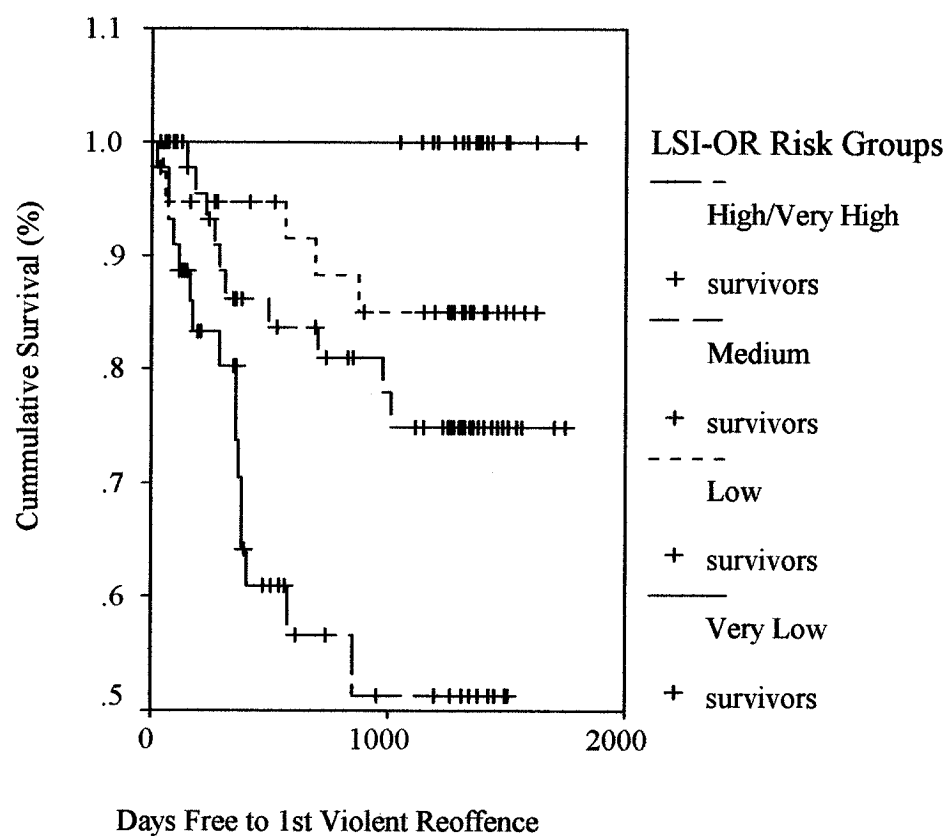


Figure 11. Survival to first violent recidivism by the LSI-OR four risk groups ($N = 154$).

Figure 12 presents a graphic output, showing plots with four cumulative survival curves, for each LSI-OR risk level, with respect to *nonviolent (yes-no) recidivism*. The survival functions descend because the probability of survival decreases as the pool of survivors decreases (the number of recidivistic events increases). The mean survival time for the very low-risk level offenders was 1662 days ($CI = 1481, 1843, SE = 92$). The mean survival time for the low risk level offenders was 1231 days ($CI = 1046, 1416, SE = 94$), the mean survival time for the medium risk level offenders was 1075 days ($CI = 878, 1271, SE = 100$), and the mean survival time for the high/very high-risk level offenders was 597 days ($CI = 435, 758, SE = 82$).

When alpha was set at .05, the nonparametric test of independence was highly significant ($Log Rank = 31.51, df = 3, p < .0001$). It means that, including the non-recidivists' time to censor, the risk level differentiated between survival probabilities in that a higher risk level was associated with a lower survival probability. This confirms that the rates of survival are inversely related to the LSI-OR risk levels, in accord with original hypothesis. Concurrently, except for the low and medium risk groups, the 95% confidence intervals for the mean survival time at each risk level did not overlap, indicating that these survival times were different from one another at the .05 level.

When further comparisons were made between each risk level, concerning the difference between the numbers of nonviolent recidivistic (terminal events) at these levels, the Breslow (or generalized Wilcoxon) test's results indicated the following:

The high/very high-risk level survival function was established to be significantly different from the moderate risk ($Breslow = 6.15, p < .05$), the low risk ($Breslow = 16.34, p < .001$), and the very low risk survival functions ($Breslow = 17.07, p < .0001$). The moderate risk survival function was significantly different from the very low survival function ($Breslow = 7.56,$

$p < .01$), but it was not significantly different from the low risk survival function (*Breslow* = 2.86, $p = .09$). The low risk level survival function was not significantly different from the very low survival function (*Breslow* = 3.00, $p = .08$). These findings are generally consistent with, but not identical to the confidence interval comparisons on mean survival time, as overlap was revealed between the CI's of the mean survival time for the low and moderate risk levels.

In summary, it is clear that the high/very high combined group is different from all other risk groups on both measures and for all three dependent variables. Differentiation between risk levels is less pronounced for violent recidivism than it is for nonviolent recidivism (i.e., overlapping CI's between the very low and low risk mean survival times for violent recidivism). While the high and very high-risk groups were collapsed because of their small *N*s, it appears that the survival curves of the very low and low risk groups for general and nonviolent recidivism are not significantly different according to the Breslow statistic, although the CI's for their mean survival time are different. Finally, the low and moderate groups' survival curves are not significantly different. In other words, except for the high/very high group, it is common for the survival curves of adjacent risk groups to be not significantly different from each other.

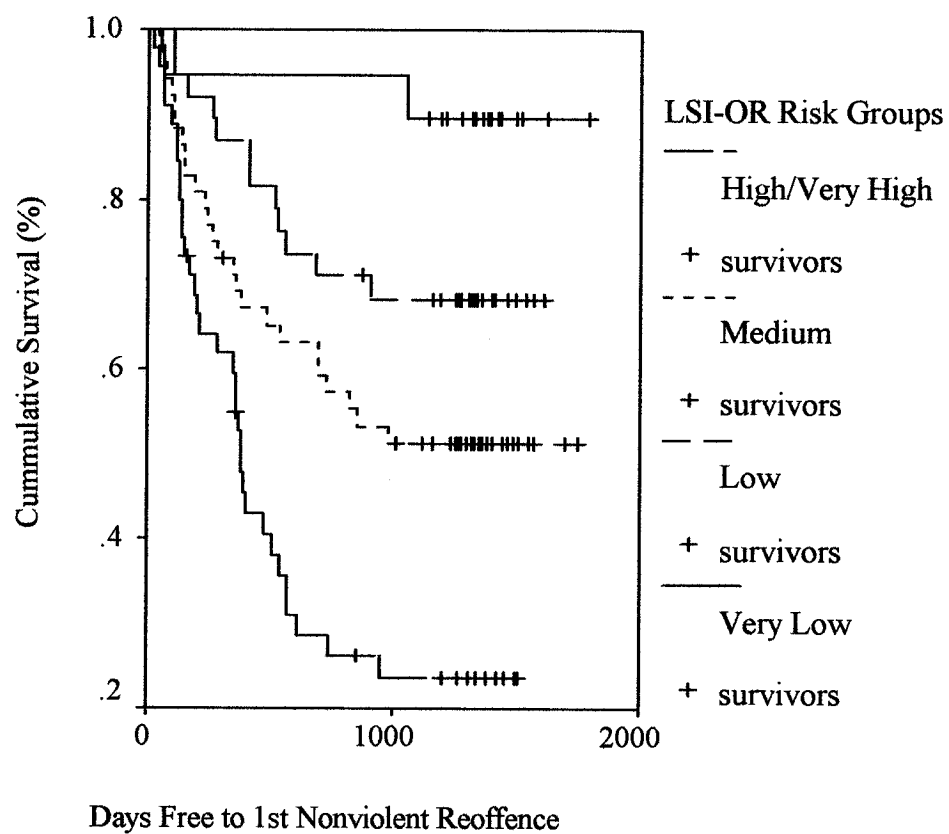


Figure 12. Survival to first nonviolent recidivism by the LSI-OR four risk groups ($N = 154$).

Multiple regression analyses: LSI-OR in prediction of recidivism in youth. In this section, hierarchical multiple regression analyses are used to determine the best combination of predictors of recidivism for the current sample of young offenders.

The first set of analyses employed the Logistic regression method to determine whether the linear combination of Sections A, B, C, F, and G from the LSI-OR (the '5-Section model') was able to predict the likelihood of an offender's general, violent and nonviolent recidivism when each of these outcome variables was defined in a binary (yes-no) format. In accordance with hypotheses three, four and five, one of the purposes of this study was to identify which LSI-OR Sections make unique contribution to the prediction of recidivism in young offenders. The logistic regression method was employed to determine whether LSI-OR Sections were able to predict the likelihood of a young offender recidivating, while controlling for the other variables in the model.

A hierarchical (sequential) logistic multiple regression analysis was applied to the complete sample of young offenders with a Location variable (custody-community) as a covariate. Specifically, a hierarchical logistic multiple regression in which blocks of predictors were forced into the equation, (i.e., Forward Selection of blocks), regardless of whether individual predictors within a block met the criterion for entry, was performed (Pedhazur, 1997, p. 229). As stated by Pedhazur (1997), and Tabachnick and Fidell (1996), the sole purpose of such a Blockwise Selection is to note whether blocks entered at later stages add meaningfully to the prediction of the criterion after considering the previous blocks, having entered them in an order specified by the researcher. This was done in order to examine whether the addition of LSI-OR Sections B, C, F, and G, offered any incremental predictive validity after having force-entered LSI-OR Section A ("Enter" method), which followed the Location (custody-community)

variable's initial entry ("Enter" method). In other words, while Location was controlled for, the LSI-OR Section A was entered and assessed for its incremental predictive validity. Only after that, while Location and Section A were controlled for, the LSI-OR Sections (B, C, F, & G) were entered as a block and assessed for their incremental predictive validity.

Logistic regression resembles multiple linear regression, except that the former is appropriate when the dependent, or predicted, variable is categorical. When there are only two categories (1-0), as in the following analyses, logistic regression models the natural algorithm of the odds of being in the category of interest as a linear function of the independent variables. In evaluating these models' predictive accuracy (discriminatory power), the model's 'discrimination criterion', the c statistic, was used (SPSS Regression Models 10.0, 1999). Since the c statistic equals the area under the ROC curve, its values ranging from 0.5 to 1.0, the areas under the ROC curves (AUCs) were calculated for the logistic regression models. This measure of discriminative/predictive accuracy is useful because it is independent of selection ratios and low base rates. The comparisons of the model under scrutiny (i.e., Location variable linearly combined with the LSI-OR 5-Sections), in terms of its discriminatory/predictive power (in assigning a higher probability of recidivating to the cases who recidivate), for the general, violent and nonviolent recidivism, were presented following the respective logistic regression results.

The second set of analyses employed a multiple regression with a Blockwise Selection, using "Enter" and "Stepwise" methods. It was applied to the complete sample of young offenders, in order to assess how to predict the Number of total, violent, and nonviolent charges (continuous) outcome variables most accurately on the sample of young offenders. This was done in order to examine whether the addition of LSI-OR Sections B, C, F, and G, offered any incremental predictive validity after having force-entered Location ("Enter" method), followed

by the LSI-OR Section A (“Enter” method). These LSI-OR Sections B, C, F, and G were allowed to enter the equation if they contributed to the prediction of recidivism, over and above what was accounted for by the forced-entry Location and Section A variables.

Specifically, while Location and Section A were controlled for, the LSI-OR Sections (B, C, F, & G) were subjected to Stepwise Selection. Pedhazur (1997, p.227) advises “a combination of forcing some blocks into the equation and doing Blockwise or Stepwise Selection on others is particularly useful in applied settings.” Further, he says “such a scheme is completely reasonable from a predictive frame of reference, as it makes practical sense to see whether, after having used a variable, using other existing variables is worthwhile.” (Pedhazur, 1997, p. 229). After the Location and LSI-OR Section A were accounted for, the remaining Sections (B, C, F, & G) or contributions of their effects on recidivism were evaluated based on solely mathematical principles (i.e., Stepwise Selection). In this way, Stepwise Selection constituted the means of exploration regarding the added Sections’ (B, C, F, & G) unique effects on recidivism, as a reflection of the specific (Caucasian male) northern young offender sample (D. Schindler, personal communication, October 17, 2003).

The third set of analyses employed a multiple regression with a Blockwise Selection, using “Enter” and “Stepwise” methods on the complete sample of young offenders, in order to examine whether the established major predictors of young offenders recidivism (“Big Four,” Andrews & Bonta, 1998) are supplemented by additional risk factors, as included in Section A of the LSI-OR. Specifically, the “Enter” method was used to force LSI-OR Criminal History (A1), Antisocial Companions (A5), Antisocial Attitudes (A6), and Antisocial Pattern/Personality (A8) into the equation as a block, after having force-entered Location (“Enter” method) treated as a “nuisance” variable that was given higher priority for entry (Tabachnick & Fidell, 1996, p. 149).

These four Section A subscales (A1, A5, A6, & A8) were selected as they represent the “Big Four” risk factors identified in criminological research. The other Section A variables, Education/Employment (A2), Family/Marital (A3), Leisure/Recreation (A4), and Substance Abuse (A7), were allowed to enter the equation if they contributed to the prediction of recidivism, over and above what was accounted for by the forced-entry Location and “Big Four” variables. These four Section A subscales (A2, A3, A4, & A7) effects on recidivism were evaluated based on solely mathematical principles (i.e., Stepwise Selection). In this way, Stepwise Selection constitutes a means of exploring the additional risk factors’ unique effects on recidivism for this specific sample of Caucasian, male young offenders from Northern Ontario (D. Schindler, personal communication, October 17, 2003).

This analysis was conducted three times with the Number of total charges, Number of violent charges and Number of nonviolent charges as the outcome variables.

First, prior to testing the 5-Section Model of the LSI-OR instrument, the ability of the LSI-OR total score to predict general recidivism was assessed. This was accomplished by entering the LSI-OR total score as the independent variable, predicting likelihood of recidivating. The logistic regression analysis with LSI-OR total score as the sole independent variable resulted in 68.8 % success rate in predicting general recidivism ($Beta = .139$, $SE = .026$, $\chi^2 = 213.463 - 178.099 = 35.36$, $df = 1$, $p < .001$), showing that it successfully differentiates between the odds of recidivating and not recidivating for the current sample of young offenders. Table 37 shows that 21 (13.6%) cases were misclassified as recidivists (false positives) and 27 (17.5%) cases were incorrectly predicted to be nonrecidivists (false negatives or ‘misses’), leading to an overall accuracy or ‘hit rate’ of 68.9 %.

Figure 13 provides a graphic representation of the relationship between LSI-OR total score and the prediction of general recidivism. As presented in Figure 13, the area under the ROC curve ($AUC = .766$, $SE = .038$, $p < .0005$) yielded a quantitative index of the model's high diagnostic accuracy indicating that 77 % of all possible pairs of cases, in which one recidivates and the other does not, the logistic regression model assigns a higher probability of recidivating to the case that recidivates (SPSS Regression Models 10.0, 1999, p.61).

Table 37

Two-By-Two Prediction Table of General Recidivism (Yes- No) with LSI-OR Total Score as a Sole Predictor

Actual	Predicted	
	Did not recidivate	Recidivated
	<i>N (%)</i>	
Did not recidivate	55 (35.7)	21 (13.6)
Recidivated	27 (17.5)	51 (33.1)

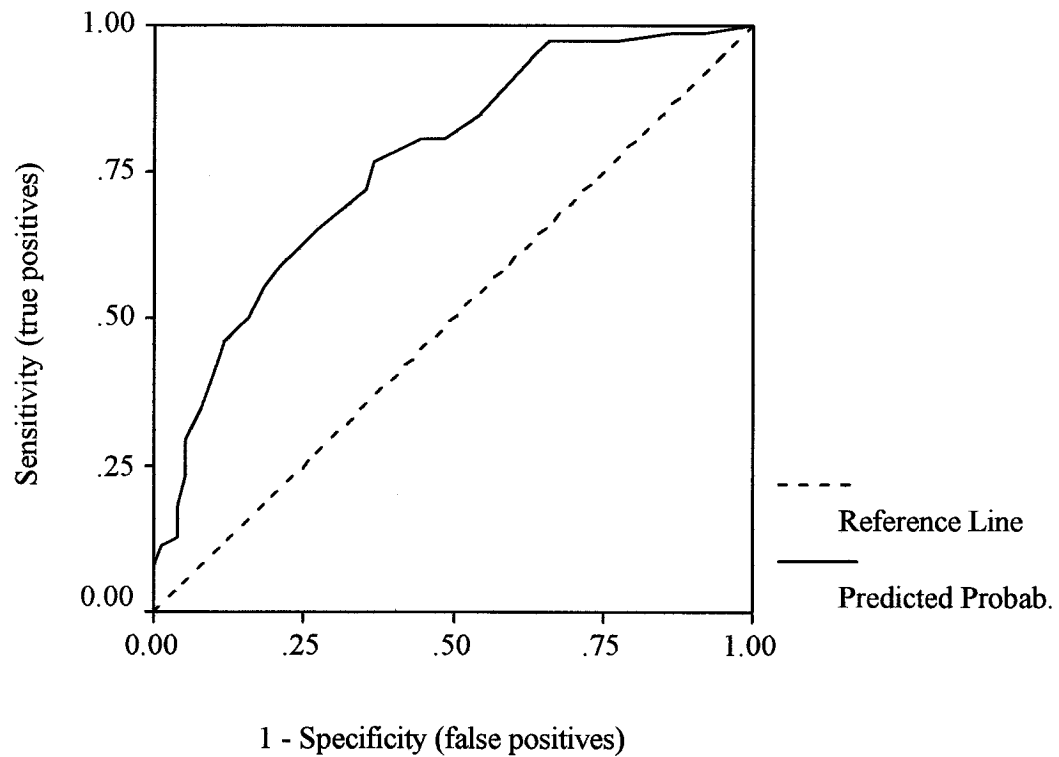


Figure 13. The ROC method's estimate of the LSI-OR total score's accuracy to predict general recidivism ($AUC = .766$, $SE = .038$, $p < .001$).

As can be seen from the Figure 13, in prediction of general recidivism amongst the current sample of young offenders, the LSI-OR total score has a high diagnostic accuracy, considering its large-sized ($>.70$) AUC (Douglas & Webster, 1999).

Second, the ability of the two combined LSI-OR factors (Static factor and Dynamic factor) to predict general recidivism was assessed. This was accomplished by entering these Static and Dynamic factor scores as the independent variables, predicting likelihood of recidivating based on any convictions (yes-no). The logistic regression analysis with both the Static and Dynamic factors combined as predictors resulted in a 69.5 % success rate in predicting general recidivism ($Beta = .896, SE = .216, p = .000; Beta = .662, SE = .218, p = .002$, for Static and Dynamic factors, respectively). As Table 38 shows, 24 (15.6%) cases were misclassified as recidivists (false positives) and 23 (14.9 %) cases were incorrectly predicted to be non-recidivists (false negatives or ‘misses’), leading to an overall accuracy or ‘hit rate’ of 69.5 %.

The area under the ROC curve for the current two-factor logistic regression model ($AUC = .789, SE = .036, p < .0005$) yielded a quantitative index of the model’s high diagnostic accuracy, indicating that in 79 % of all possible pairs of cases, in which one case recidivates and the other does not, the logistic regression model assigns a higher probability of recidivating to the case which recidivates. Thus, the use of the multiple regression derived combination of the Static and Dynamic factor variables, in predicting general recidivism in the current sample, provides an improvement of 2.3 % in predictive accuracy over the LSI-OR total score-based model’s accuracy, (previously presented), that was based on the same LSI-OR data but derived from the LSI-OR items’ simple summation rather than combining them into factors (weighing them).

Table 38

Two-By-Two Prediction Table of General Recidivism (Yes- No) with Static and Dynamic LSI-OR Factors as Predictors

Actual	Predicted	
	Did not recidivate	Recidivated
	N (%)	
Did not recidivate	52 (33.7)	24 (15.6)
Recidivated	23 (14.9)	55 (35.8)

Third, the Location (custody-community) variable, the LSI-OR Section A, and the LSI-OR Sections (B, C, F, and G) were sequentially force-entered as 3 subsequent blocks of independent variables to predict general recidivism (yes-no). After holding constant initial differences due to Location (custody-community), it was possible to determine how well we can predict general recidivism from the LSI-OR Section A and, after that, from the other LSI-OR Sections (B, C, F, and G).

It can be seen from Table 39, that the Location variable (custody-community) was a significant predictor of general recidivism when it was the sole predictor in the model (Step1). The LSI-OR Section A contributed uniquely to the prediction of general recidivism, controlling for the effects of the Location variable. Location variable no longer made unique contribution when it was in the equation with Section A (Step 2).

The evaluation of final logistic regression model of general recidivism, when the LSI-OR Other Sections (B, C, F, & G) totals were entered last, reveals that three variables -- Location (custody-community), General risk/needs factors (Section A) and Responsivity considerations (Section G) - uniquely contributed to the model, controlling for the effects of the other variables in the equation.

Table 39

Total Sample (N = 154): Summary of Hierarchical Logistic Multiple Regression Model in Prediction of General Recidivism (Yes-No) from Location, LSI-OR Scale A, and LSI-OR Scales (B, C, F, & G) Totals

Predictor Variable	Estimate	SE
Step 1 ("Enter")		
Location)	1.556	.367***
Step 2 ("Enter")		
Location	.763	.422
General risk/need factors (Section A)	.116	.029***
Step 3 ("Enter")		
Location	.958	.442*
General risk/need factors (Section A)	.108	.035**
Specific risk/need factors (Section B)	-.200	.129
Prison experience (Section C)	.088	.695
Other client issues (Section F)	.000	.111
Responsivity considerations (Section G)	.688	.300*

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

Table 40 shows the proportion of correctly and incorrectly classified cases for the final model of general recidivism in (Caucasian male) northern youth. The hierarchical logistic multiple regression analysis resulted in 72.7 % success rate in predicting general recidivism, showing that it successfully differentiated between the odds of recidivating and not recidivating for the current sample of young offenders. Table 40 shows that 18 (11.7%) cases were misclassified as recidivists (false positives) and 24 (15.6%) cases were incorrectly predicted to be nonrecidivists (false negatives or ‘misses’), leading to an overall accuracy or ‘hit rate’ of 72.9 %.

The area under the ROC curve for the final model of general recidivism (yes-no) ($AUC = .801$, $SE = .036$, $p < .0005$) yielded a quantitative index of the model’s high diagnostic accuracy, indicating that in 80% of all possible pairs of cases, in which one case recidivates and the other does not, the logistic regression model assigns a higher probability of recidivating to the case which recidivates. Thus, the use of the logistic multiple regression derived combination of predictors in the final model of general recidivism provides a 3.0 % improvement in predictive accuracy over the LSI-OR total score-based model’s accuracy, (previously presented), that was based on the same LSI-OR data but derived from the LSI-OR items’ simple summation rather than combining them into factors (weighing them). The final model also provides a 1.0 % improvement in predictive accuracy over the model with the two combined LSI-OR factors (Static and Dynamic).

Table 40

Two-By-Two Prediction Table of General Recidivism (Yes- No) with Blockwise Selected Predictors: Location, LSI-OR Scale A, and LSI-OR Scales (B, C, F, & G) Totals

	Predicted	
	Did not recidivate	Recidivated
Actual	N (%)	
Did not recidivate	58 (37.7)	18 (11.7)
Recidivated	24 (15.6)	54 (35.1)

Fourth, the Location (custody-community) variable, the LSI-OR Section A, and the LSI-OR Sections (B, C, F, and G) were sequentially force-entered as 3 subsequent blocks of independent variables to predict violent recidivism (yes-no). After holding constant initial differences due to Location (custody-community), it was possible to determine how well we can predict violent recidivism from the LSI-OR Section A and, after that, from the other LSI-OR Sections (B, C, F, and G).

It can be seen from Table 41, that the Location variable (custody-community) was not a significant predictor of violent recidivism when it was the sole predictor in the model (Step1). The LSI-OR Section A contributed uniquely to the prediction of violent recidivism, controlling for the effects of the Location variable (Step 2).

The evaluation of final logistic regression model of violent recidivism, when the LSI-OR Sections (B, C, F, & G) totals were entered last, reveals that only one variable -- LSI-OR General

risk/needs factors (Section A) -- uniquely contributed to the model, controlling for the effects of the other variables in the equation.

Table 42 shows the proportion of correctly and incorrectly classified cases for the final model of violent recidivism in (Caucasian male) northern youth. The hierarchical logistic multiple regression analysis resulted in 79.9 % success rate in predicting violent recidivism, showing that it successfully differentiated between the odds of violently recidivating and not recidivating for the current sample of young offenders. Table 42 shows that 3 (1.9 %) cases were misclassified as recidivists (false positives) and 28 (18.2 %) cases were incorrectly predicted to be nonrecidivists (false negatives or 'misses'), leading to an overall accuracy or 'hit rate' of 65.6%.

Table 41

Total Sample (N = 154): Summary of Hierarchical Logistic Multiple Regression Model in Prediction of Violent Recidivism (Yes-No) from Location, LSI-OR Scale A, and LSI-OR Scales (B, C, F, & G) Totals

Predictor Variable	Estimate	SE
Step 1 ("Enter")		
Location)	.757	.407
Step 2 ("Enter")		
Location	.009	.457
General risk/need factors (Section A)	.103	.032**
Step 3 ("Enter")		
Location	-.026	.483
General risk/need factors (Section A)	.077	.038*
Specific risk/need factors (Section B)	.186	.134
Prison experience (Section C)	.158	.665
Other client issues (Section F)	-.116	.139
Responsivity considerations (Section G)	.177	.297

* $p < .05$. ** $p < .01$.

Table 42

Two-By-Two Prediction Table of Violent Recidivism (Yes- No) with Blockwise Selected

Predictors: Location, LSI-OR Scale A, and LSI-OR Scales (B, C, F, & G) Totals

	Predicted	
	Did not recidivate	Recidivated
Actual	N (%)	
Did not recidivate	120 (77.9)	3 (1.9)
Recidivated	28 (18.2)	3 (1.9)

The area under the ROC curve for the final model of violent recidivism (yes-no) ($AUC = .742$, $SE = .046$, $p < .0005$) yielded a quantitative index of the model's high diagnostic accuracy, indicating that in 74 % of all possible pairs of cases, in which one case recidivates violently and the other does not, the logistic regression model assigns a higher probability of recidivating to the case which recidivates. Although LSI-OR Section A was the only variable that made a unique contribution to the prediction of violent recidivism in the discussed model, the use of the logistic multiple regression-derived combination of predictors, in contrast to using Section A total as a sole predictor, provides a 2.1 % improvement in predictive accuracy (Section A total score $AUC = .721$, $SE = .047$, $p < .0005$). The final model of violent recidivism provides a 2.9 % improvement in predictive accuracy over the model with the two combined, Static and Dynamic, LSI-OR factors ($AUC = .713$, $SE = .048$, $p < .0005$).

Fifth, the Location (custody-community) variable, the LSI-OR Section A, and the LSI-OR Sections (B, C, F, and G) were sequentially force-entered as 3 subsequent blocks of independent variables to predict nonviolent recidivism (yes-no). After holding constant initial differences due to Location (custody-community), it was possible to determine how well we can predict nonviolent recidivism from the LSI-OR Section A and, after that, from the other LSI-OR Sections (B, C, F, and G).

It can be seen from Table 43, that the Location variable (custody-community) was a significant predictor of nonviolent recidivism when it was the sole predictor in the model (Step1). The LSI-OR Section A contributed uniquely to the prediction of nonviolent recidivism, controlling for the effects of the Location variable. Location variable no longer made significant contribution when it was in the equation with Section A (Step 2).

The evaluation of final logistic regression model of nonviolent recidivism, when the LSI-OR Other Sections' (B, C, F, & G) totals were entered last, reveals that three variables -- Location (custody-community), General risk/needs factors (Section A) and Responsivity considerations (Section G) -- uniquely contributed to the model, controlling for the effects of the other variables in the equation.

Table 44 shows the proportion of correctly and incorrectly classified cases for the final model of nonviolent recidivism in (Caucasian male) northern youth. The hierarchical logistic multiple regression analysis resulted in 73.4 % success rate in predicting nonviolent recidivism, showing that it successfully differentiated between the odds of nonviolently recidivating and not recidivating for the current sample of young offenders. Table 44 shows that 18 (11.7 %) cases were misclassified as recidivists (false positives) and 23 (14.9 %) cases were incorrectly

predicted to be nonrecidivists (false negatives or ‘misses’), leading to an overall accuracy or ‘hit rate’ of 73.4%.

The area under the ROC curve for the final model of nonviolent recidivism (yes-no) ($AUC = .785, SE = .037, p < .0005$) yielded a quantitative index of the model’s high diagnostic accuracy, indicating that in 78.5 % of all possible pairs of cases, in which one case recidivates nonviolently and the other does not, the logistic regression model assigns a higher probability of recidivating to the case which recidivates. The use of the logistic multiple regression-derived combination of predictors in the final model of nonviolent recidivism provides a 4.0 % improvement in predictive accuracy over the LSI-OR total score-based model’s accuracy, ($AUC = .745, SE = .039, p < .0005$). The final model provides a 1.2 % improvement in predictive accuracy over the model with the two combined, Static and Dynamic, LSI-OR factors ($AUC = .773, SE = .037, p < .0005$).

Table 43

Total Sample (N = 154): Summary of Hierarchical Logistic Multiple Regression Model in Prediction of Nonviolent Recidivism (Yes-No) from Location, LSI-OR Scale A, and LSI-OR Scales (B, C, F, & G) Totals

Predictor Variable	Estimate	SE
Step 1 ("Enter")		
Location)	1.436	.356***
Step 2 ("Enter")		
Location	.713	.410
General risk/need factors (Section A)	.103	.028***
Step 3 ("Enter")		
Location	.911	.430*
General risk/need factors (Section A)	.101	.035**
Specific risk/need factors (Section B)	-.227	.127
Prison experience (Section C)	-.822	.795
Other client issues (Section F)	.063	.109
Responsivity considerations (Section G)	.564	.286*

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

Table 44

Two-By-Two Prediction Table of Nonviolent Recidivism (Yes- No) with Blockwise Selected Predictors: Location, LSI-OR Scale A, and LSI-OR Scales (B, C, F, & G) Totals

Actual	Predicted	
	Did not recidivate	Recidivated
	<i>N (%)</i>	
Did not recidivate	64 (41.6)	18 (11.7)
Recidivated	23 (14.9)	49 (31.9)

In predicting the number of total, violent, and nonviolent charges (as continuous outcome variables) for the complete sample of young offenders, a Blockwise Selection, using “Enter” and “Stepwise” methods, was applied to the LSI-OR five Sections (A, B, C, F, & G). The following are the results of three analyses in which, after holding constant initial differences due to Location (custody-community), it was possible to determine how well we can predict total, violent, and nonviolent charges from the LSI-OR Section A and, after that, from the other LSI-OR Sections (B, C, F, and G), subjected to Stepwise Selection.

First, in predicting the total number of charges outcome variable for the current young offender sample, on Step 1, the Location variable (custody-community) was entered as a significant control variable ($B = 3.105$, $SE = .842$, $p < .0005$). On Step 2, a multiple R of .432 ($R^2 = .186$) was obtained with Location ($B = 1.030$, $SE = .925$, $p = .267$) and Section A ($B = .249$, $SE = .057$, $p < .0005$), which were sequentially force-entered (2 Blocks). No other LSI-OR

Sections were included in the model, because they did not meet the F-to-enter criteria for inclusion, which was $p < .05$ (Stepwise Selection). The excluded predictors' (Sections B, C, F, & G) partial correlations with the criterion were feeble, ranging from $-.108$ to $.020$. This indicates that, in their relationship with the outcome variable, Sections B, C, F, and G were redundant to Section A, and not demonstrating unique relationships with the outcome variable. Thus, in predicting the total number of charges' recidivism variable in the current sample of young offenders, Section A was the only LSI-OR Section that contributed to the model, uniquely accounting for 10.4 % of the variance in recidivism after initial differences due to Location were held constant.

Second, total number of violent charges variable was used as recidivism variable for the total sample of young offenders. On Step 1, the Location variable (custody-community) was entered as a significant control variable ($B = .461$, $SE = .226$, $p = .043$). On step 2, a multiple R of $.256$ ($R\ square = .066$) was obtained with Location ($B = .130$, $SE = .258$, $p = .615$) and Section A ($B = .040$, $SE = .016$, $p = .013$), which were force-entered sequentially (2 Blocks). No other LSI-OR Sections were included in the model, because they did not meet the F-to-enter criteria for inclusion, which was $p < .05$ (Stepwise Selection). The excluded predictors' (Sections B, C, F, & G) partial correlations with the criterion were feeble, ranging from $-.061$ to $.075$. This indicates that, in their relationship with the outcome variable, Sections B, C, F, and G were redundant to Section A, and not demonstrating unique relationships with the outcome variable. Thus, in predicting the number of violent charges' recidivism variable in the current sample of young offenders, Section A was the only LSI-OR Section that contributed to the model, uniquely accounting for 3.9 % of the variance in violent recidivism, after initial differences due to Location were held constant.

Third, total number of nonviolent charges variable was used as recidivism variable for the total sample of young offenders. On Step 1, the Location variable (custody-community) was entered as a significant control variable ($B = 2.645$, $SE = .745$, $p = .001$). On step 2, a multiple R of .414 ($R\ square = .171$) was obtained with Location ($B = .900$, $SE = .823$, $p = .276$) and Section A ($B = .209$, $SE = .050$, $p < .0005$), which were sequentially force-entered (2 Blocks). No other LSI-OR Sections were included in the model, because they did not meet the F-to-enter criteria for inclusion, which was $p < .05$. The excluded predictors' (Sections B, C, F, & G) partial correlations with the criterion were weak, ranging from $-.131$ to $.041$. This indicates that, in their relationship with the outcome variable, Sections B, C, F, and G were redundant to Section A, and did not demonstrate unique relationships with the outcome variable. Thus, in predicting the number of nonviolent charges' recidivism variable in the current sample of young offenders, Section A was the only LSI-OR Section that contributed to the model, uniquely accounting for 9.5 % of the variance in nonviolent recidivism, after initial differences due to Location were held constant.

In the last series of multiple regression analyses, recidivism represented by total, violent, and nonviolent charges was the dependent variable, after having initially force-entered Location ("Enter"- Step 1). This was followed by the forced-entry of the LSI-OR Section A's "Big Four" Predictors, specifically Criminal history (A1), Companions (A5), Procriminal attitudes (A6) and Antisocial pattern/personality (A8) ("Enter"- Step 2). On the last step ("Stepwise Selection" – Step 3), four complimentary to the previously entered major predictors of recidivism were allowed to enter, Education/employment (A2), Family/marital (A3), Leisure/recreation (A4), and Substance abuse (A7). They were allowed to enter the equation if they contributed to the

prediction of recidivism above and beyond what was accounted for by the forced-entry Location and Section A “Big Four” variables.

The following are the results of three analyses, which established the best predictors of number of total, violent and nonviolent charges for the entire sample of (Caucasian male) northern young offenders.

As for the total charges outcome variable, it can be seen from Table 45, that the Location variable (custody-community) was a significant predictor of total charges, when it was the sole predictor in the model (Step1). With the block of “Big Four” major predictor subscales, eligible to enter on Step 2, a multiple R of .439 ($R^2 = .193$) was obtained with Location ($Beta = .051$), Criminal history ($Beta = .336$), Companions ($Beta = .098$), Procriminal attitudes ($Beta = .071$), and Antisocial pattern ($Beta = -.002$). Table 45 shows that the Criminal history subscale contributed uniquely ($p = .003$) to the prediction of total charges, controlling for the effects of the Location variable, which no longer made unique contribution when it was in the equation with Section A (Step 2).

With the remaining four complementary predictor subscales eligible to enter on Step 3, a multiple R of .482 ($R^2 = .233$) was obtained with Location ($Beta = .043$), Criminal history ($Beta = .371$), Companions ($Beta = .046$), Procriminal attitudes ($Beta = .067$), Antisocial pattern ($Beta = -.090$) and Leisure/recreation ($Beta = .224$). Leisure/Recreation was the only additional subscale that met F-to-enter criteria ($p < .05$), at Step 3, entering equation and showing a substantial degree of incremental predictive validity. The remaining three subscales did not meet the criteria for entry (Education/employment, Family/marital, and Substance abuse).

In summary, the final model of total charges for the entire sample of (Caucasian male) young offenders reveals that two variables - Criminal history subscale (A1) and

Leisure/recreation subscale (A4) - uniquely contributed to the model, controlling for the effects of the other variables in the equation.

Caution should be exercised in interpreting these results, as it would be incorrect to conclude, based on mathematically driven exclusion of variables from the model, that school and education, family dynamics, and addiction-based problems are not important determiners of future criminal activity in young offenders (Pedhazur, 1997). A replication of this study on a different sample of young offenders is on order.

Table 45

Total Sample (N = 154): Summary of Blockwise and Stepwise Multiple Regression in Predicting Total Charges from Location, LSI-OR Subscale “Big Four” Predictors (A1, A5, A6, A8), and LSI-OR Subscale Four Complementary Predictors (A2, A3, A4, A7)

Predictor Variable	<i>B</i>	<i>SE B</i>	<i>Beta</i>
Step 1 (“Enter”)			
Location)	3.105	.842	.287***
Step 2 (“Enter”)			
Location	.554	.991	.051
Criminal history (A1)	.640	.211	.336**
Companions (A5)	.583	.477	.098
Procriminal attitudes (A6)	.366	.480	.071
Antisocial pattern (A8)	-.008	.543	-.002
Step 3 (Stepwise Selection)			
Location	.467	.970	.043
Criminal history (A1)	.708	.208	.371**
Companions (A5)	.276	.480	.046
Procriminal attitudes (A6)	.342	.470	.067

Table 45 (continued)

Total Sample (N = 154): Summary of Blockwise and Stepwise Multiple Regression in Predicting Total Charges from Location, LSI-OR Subscale “Big Four” Predictors (A1, A5, A6, A8), and LSI-OR Subscale Four Complementary Predictors (A2, A3, A4, A7)

Predictor Variable	<i>B</i>	<i>SE B</i>	<i>Beta</i>
Step 3 (Stepwise Selection)			
Antisocial pattern (A8)	-.433	.553	-.090
Leisure/recreation (A4)	1.457	.527	.224**

** $p < .01$. *** $p < .001$.

As for the violent charges outcome variable, it can be seen from Table 46, that the Location variable (custody-community) was a significant predictor of violent charges, when it was the sole predictor in the model (Step1). With the block of “Big Four” major predictor subscales, eligible to enter on Step 2, a multiple R of .306 ($R^2 = .093$) was obtained with Location ($Beta = -.011$), Criminal history ($Beta = .341$), Companions ($Beta = -.034$), Procriminal attitudes ($Beta = .149$), and Antisocial pattern ($Beta = -.137$). Table 46 shows that the Criminal history subscale contributed uniquely ($p = .004$) to the prediction of violent charges, controlling for the effects of the Location variable, which no longer made unique contribution when it was in the equation with Section A (Step 2).

With the remaining four complementary predictor subscales eligible to enter on Step 3, in a Stepwise fashion, a multiple R of .353 ($R^2 = .124$) was obtained with Location ($Beta = -.013$),

Criminal history ($Beta = .348$), Companions ($Beta = -.026$), Procriminal attitudes ($Beta = .123$), antisocial pattern ($Beta = -.230$) and Education/employment ($Beta = .205$).

Education/employment was the only additional subscale that met F-to-enter criteria ($p < .05$), at Step 3, entering equation and showing a substantial degree of incremental predictive validity. The remaining three subscales did not meet the criteria for entry (Family/marital, Leisure/recreation, and Substance abuse).

In summary, the final model of violent charges for the entire sample of (Caucasian male) northern young offenders reveals that two variables - Criminal history subscale (A1) and Education/employment subscale (A2) - uniquely contributed to the model, controlling for the effects of the other variables in the equation.

Table 46

Total Sample (N = 154): Summary of Blockwise and Stepwise Multiple Regression in Predicting Violent Charges from Location, LSI-OR Subscale “Big Four” Predictors (A1, A5, A6, A8), and LSI-OR Subscale Four Complementary Predictors (A2, A3, A4, A7)

Predictor Variable	<i>B</i>	<i>SE B</i>	<i>Beta</i>
Step 1 (“Enter”)			
Location)	.461	.226	.163*
Step 2 (“Enter”)			
Location	-.030	.274	-.011
Criminal history (A1)	.170	.058	.341**
Companions (A5)	-.053	.132	-.034
Procriminal attitudes (A6)	.199	.133	.149
Antisocial pattern (A8)	-.171	.150	-.137
Step 3 (Stepwise Selection)			
Location	-.035	.270	-.013
Criminal history (A1)	.173	.057	.348**
Companions (A5)	-.040	.130	-.026
Procriminal attitudes (A6)	.165	.132	.123

Table 46 (continued)

Total Sample (N = 154): Summary of Blockwise and Stepwise Multiple Regression in Predicting Violent Charges from Location, LSI-OR Subscale “Big Four” Predictors (A1, A5, A6, A8), and LSI-OR Subscale Four Complementary Predictors (A2, A3, A4, A7)

Predictor Variable	<i>B</i>	<i>SE B</i>	<i>Beta</i>
Step 3 (Stepwise Selection)			
Antisocial pattern (A8)	-.287	.157	-.230
Education / employment (A2)	.123	.054	.205*

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

As for the nonviolent charges outcome variable, it can be seen from Table 47, that the Location variable (custody-community) was a significant predictor of nonviolent charges, when it was the sole predictor in the model (Step1). With the block of “Big Four” major predictor subscales, eligible to enter on Step 2, a multiple R of .418 ($R^2 = .175$) was obtained with Location ($Beta = .061$), Criminal history ($Beta = .279$), Companions ($Beta = .121$), Procriminal attitudes ($Beta = .037$), and Antisocial pattern ($Beta = .038$). Table 47 shows that the Criminal history subscale contributed uniquely ($p = .014$) to the prediction of nonviolent charges, controlling for the effects of the Location variable, which no longer made unique contribution when it was in the equation with Section A (Step 2).

With the remaining four complementary predictor subscales eligible to enter on Step 3, in a Stepwise fashion, a multiple R of .468 ($R^2 = .219$) was obtained with Location ($Beta = .053$), Criminal history ($Beta = .316$), Companions ($Beta = .067$), Procriminal attitudes ($Beta = .032$),

Antisocial pattern ($Beta = -.055$), and Leisure/recreation ($Beta = .235$). Leisure/recreation was the only additional subscale that met F-to-enter criteria ($p < .05$), at Step 3, entering equation and showing a substantial degree of incremental predictive validity. The remaining three subscales did not meet the criteria for entry (Education/employment, Family/marital, and Substance abuse).

In summary, the final model of nonviolent charges for the entire sample of (Caucasian male) northern young offenders reveals that two variables -- Criminal history subscale (A1) and Leisure/recreation subscale (A4) - uniquely contributed to the model, controlling for the effects of the other variables in the equation.

Table 47

Total Sample (N = 154): Summary of Blockwise and Stepwise Multiple Regression in Predicting Nonviolent Charges from Location, LSI-OR Subscale “Big Four” Predictors (A1, A5, A6, A8), and LSI-OR Subscale Four Complementary Predictors (A2, A3, A4, A7)

Predictor Variable	<i>B</i>	<i>SE B</i>	<i>Beta</i>
Step 1 (“Enter”)			
Location)	2.645	.745	.277**
Step 2 (“Enter”)			
Location	.584	.884	.061
Criminal history (A1)	.471	.188	.279*
Companions (A5)	.637	.425	.121
Procriminal attitudes (A6)	.167	.429	.037
Antisocial pattern (A8)	.162	.485	.038
Step 3 (Stepwise Selection)			
Location	.504	.863	.053
Criminal history (A1)	.533	.185	.316**
Companions (A5)	.352	.427	.067
Procriminal attitudes (A6)	.145	.419	.032

Table 47 (continued)

Total Sample (N = 154): Summary of Blockwise and Stepwise Multiple Regression in Predicting Nonviolent Charges from Location, LSI-OR Subscale “Big Four” Predictors (A1, A5, A6, A8), and LSI-OR Subscale Four Complementary Predictors (A2, A3, A4, A7)

Predictor Variable	<i>B</i>	<i>SE B</i>	<i>Beta</i>
Step 3 (Stepwise Selection)			
Antisocial pattern (A8)	-.231	.493	-.055
Leisure/recreation (A4)	1.349	.470	.235**

* $p < .05$. ** $p < .01$.

Discussion

Reason for the Study and Outline of the Discussion Section

Juvenile offending is a serious concern in today's society and has maintained its high profile in the popular media for some time. There is little chance that such a profile will abate as long as crime statistics show that youth under the age of 18 are responsible for a disproportionate amount of crime (FBI, 1998). This fact may only worsen as other statistics indicate that the decrease in crime rate, witnessed over the last decade, has occurred at about twice the rate among adults in comparison to youth (FBI, 1998).

Tertiary prevention, the reduction of recidivism among identified offenders, is one important means of addressing youth crime and, to be effective, it must incorporate empirically supported risk factors for reoffending (Cottle, Lee, & Heilbrun, 2001). The Level of Service Inventory-Ontario Revision (Andrews, Bonta & Wormith, 1995) is a risk/need instrument, which has been routinely used with offenders, including older young offenders, throughout Ontario since 1996. It was developed within the social learning perspective, focusing on personal history and interaction with others in a social context (Kroner & Mills, 2001). It contains a broad range of static and dynamic correlates of criminal behavior (Andrews & Bonta, 1998). However, its validity with youth has not been thoroughly evaluated since previous LSI-OR prediction studies have concentrated on adult offenders (Girard, 1999, Rettinger, 1998).

Therefore, the current study was conducted to assess the capacity of the Level of Service Inventory-Ontario Revision (LSI-OR) to predict recidivism among older young offenders (16 to 19-year olds) for both theoretical and practical reasons. These include the following: to determine whether risk/need items, domains (the subscales) and a complete instrument (LSI-OR) that were derived for adult offenders are equally applicable to older adolescents (Duncan,

Kennedy, & Patrick, 1995); to validate the LSI-OR with older young offenders, generally, and with specifically defined custody and community subgroups of the young offender population; to provide detailed information to the Ministry of Correctional Services about the tool's predictive power (false positives /false negatives) on the population with which it is routinely used; and to provide the Ministry with a risk/need profile of its young offender clientele so that it might advance its rehabilitative efforts in accordance with the principles of effective correctional intervention (Andrews, Bonta, & Hoge, 1990; Jung & Rawana, 1999).

This discussion will review the findings of the current study and provide commentary about these results in accordance with the following issues.

The representativeness of the sample is an important consideration in any test validation study. Disproportionate representation by location will be discussed in light of the study's design, missing data, and practice in the field and the implications of it will be addressed.

The criterion measure, in this case, recidivism, of any test validation study is another important consideration. The merits of using both binary and continuous recidivism measures are discussed in conjunction with the various statistics that require one or the other form of metric. The qualities of the ROC method are contrasted with the traditional 2x2 contingency tables. Finally, the general, violent and nonviolent recidivism rates and survival rate of the participants in the current study are reviewed.

The discussion also focuses on the LSI-OR, as the independent variable in the current study. This includes a review of its reliability, the various risk/needs factors or subscales, and their relationship with recidivism, the other LSI-OR sections (B, C, F, and G) and recidivism, the LSI-OR risk classification scheme and recidivism; the role of strengths as portrayed in the LSI-OR, and the use of the 'override' function.

A review of each of the hypotheses of the study, specified earlier, is also conducted. This includes a discussion of unusual and unexpected findings. Finally, limitations of the current study are summarized and recommendations for future research are made.

Sample Bias

Before proceeding with a discussion of the study's findings, it is important to consider the extent to which the participants were representative of the population of young offenders in northern Ontario and throughout the rest of the province.

A cohort of 154 young offenders was drawn from a geographically specified area in northern Ontario. The location was chosen because it included a good cross section of ministry facilities, including two central probation and parole offices, their satellite offices and institutions (secure and open). A natural flow of correctional admissions during the specified period of time remained undisturbed and the admission settings were said to be typical (representative) of the class of the Ministry's target settings for young offenders across Northern Ontario.

However, the final sample of 154 offenders constituted merely 38.8% of the 397 youth admitted to the Ministry of Correctional Services in the specified locations during the one-year period. The researcher was unable to find the LSI-OR assessments for 157 subjects (39.5%), who were necessarily excluded from the study. As well, 86 female and/or aboriginal subjects were eliminated from the study, due to their small numbers, not warranting inclusion of gender and ethnicity variables.

Consequently, one must ask whether there was not a bias introduced through the prejudicial process of data loss. Clearly, female and aboriginal young offenders were not included in the current study and we do not know how the LSI-OR instrument applies to these subgroups of young offenders. Therefore, generalization of the current study results to the female

and aboriginal offenders populations should be made with great caution. A replication of the study on female and aboriginal young offenders will be of the essence.

Further, there are other concerns about generalization of the findings from the current study, due to complex reasons for the loss of the data, which include the following: (a) some LSI-OR copies were missing from the files across various sites; (b) some offenders' files were moved to remote locations, being not easily retrievable; (c) some inactive files were sent to central government archives and were no longer accessible; and (d) some short-term incarcerated youth were not assessed due to the Ministry's policy that the LSI-OR assessment does not have to be completed for custody offenders with sentences of 30 days or less.

The loss of the data for the first three reasons would appear to be of little concern because such phenomena usually occur randomly, in this case reflecting certain processes which operated in various correctional settings regarding how these LSI-OR assessments were conducted, filed, stored, transferred and, sometimes, misplaced during the period between July 1997 to July 1998 or afterwards. If there could be any doubt as to how representative of Northern Ontario young offender population the current sample might be, it comes from the selective exclusion of LSI-OR for youth with short carceral sentences. This is because more than one third of the missing cases comprised institutionalized young offenders who, if sentenced to a shorter term, may not have been assessed. Since the correlation between the LSI-OR score and sentence length for the custody offenders was positive and significant, it is suggested that these youth on whom LSI-OR's were not administered would tend to have low LSI-OR scores, relative to other incarcerated youth.

However, the MCS policy regarding assessment of short-term custody youth is optional, and some youth with sentences shorter than 30 days ($N = 6$) were assessed with the LSI-OR

instrument. Their mean LSI-OR score was 17.5 in comparison to the mean LSI OR score of 19.9 for custody offenders whose sentences were 30 days or more. There was no way to determine whether those short term offenders who were tested were at greater or lesser risk than those who were not tested, but given the traditional caution of correctional agencies, one might suspect that the tested short term custody youth would likely be at greater risk than those who were not tested. Yet they still scored slightly (2.4 points) lower than the longer-term youth. Therefore, it would appear that true population mean of secure custody youth is somewhat lower than the obtained score from this study and the true percentage of moderate risk offenders in secure custody is likely to be higher than that reported herein.

A review of the sample's institutional and community subgroups and their demographic/legal characteristics will help with forming an opinion about other potential threats to generalization of the findings. Considering the proportion of young offenders in institutions (37.0%) to those under some type of community supervision (63.0%), the custody offenders were significantly over-represented in the current sample compared to the provincial average, provincial data indicating 12.0% in custody against 88.0% in community (MCS, 2002). The community sample of offenders was significantly underrepresented in the current study. Therefore, when considering the overall risk and needs of the young offender clients of the Ministry, it is important to examine the institutional and community samples separately, as is done throughout this study. It is believed that the data pertaining to Caucasian male offenders in both custody and community would probably be a reasonable representation of the large nonaboriginal population of young offenders throughout the province, although the current sample did not include black youth who are much more common in other areas of the province.

Due to under-representation of the community male young offenders in the current sample, they were studied separately from the custody male young offenders. Regarding the custody and community samples, separate analyses were performed partially because there was an overrepresentation of incarcerates, but partially because they were very different in terms of risk level and recidivism. Significantly higher risk level and recidivism rates of incarcerated offenders as compared to the community offenders were not a surprise and, in fact, they were expected. However, this was inconsistent with the fact that incarcerates and community offenders did not significantly differ on their index offence severity (IOS) and on their base rates of violent index offending, which were almost identical. The difference between custody and community participants was traced to the number of nonviolent offences, significantly higher in the custody group.

Also, the custody sample consisted of twice as many secure than open custody offenders and, thus, it is remarkable that custody offenders did not commit more severe or more violent index crimes than youth in the community. Another interesting phenomenon is that, considering the offenders' release mode, more young offenders from secure than open custody were to be released directly to the community without the probation term to follow. It was found that significant portion of custody offenders were *not* designated to undergo a gradual community re-adaptation strategy. This may explain, at least partially, why these incarcerated youth, who originally were not more serious and violent delinquents than their community counterparts, recidivated at such a rapid pace after their release.

In summary, the above problems were commented upon in pursuit of an important aspect of external validity, asking the questions about generalizability of the effects of the study. The questions as to what populations and settings can the effect be generalized (Mook, 1992) is not a

simple criterion-like question, which could be answered in a yes or no format. The goal here is to be able to explain Northern Ontario male young offenders' risk, needs, and recidivism patterns. Therefore the results by location were presented separately. When multivariate regression models are presented, 'location' (custody-community) is introduced as an important control variable. Presenting the findings on the total sample alone would be in poor judgment from an external validity viewpoint.

The Criterion Measure: Recidivism

Recidivism as a construct. In any validation study of an offender risk assessment tool, such as the LSI-OR, recidivism constitutes the ultimate criterion of the test's validity. Consequently, recidivism, as the outcome or criterion variable, should be defined in the best possible manner because it is a proxy for antisocial behavior, which is an even broader and more complex construct.

Maltz (1984) has asserted, that recidivism should be operationalized in ways that are reasonable from theoretical and data acquisition standpoints. Relying on charges and convictions alone can be risky because data are based on reported crimes from official records, not all crimes, underestimating the prevalence of antisocial behavior during a given period (Cottle, Lee, & Heilbrun, 2001). This is particularly true of young offenders. The fact that a young offender is at high risk for recidivism does not mean that he/she will recidivate violently (Wiebush et al., 1995), which leads some to suggest that separate assessments for the risk of violent and nonviolent recidivism are required.

Risk assessment research typically reports a single measure of recidivism (reoffending), although a recent study (Funk, 1999) utilized a scaled measure (a sum of the weighted scaled subcategories) that considered both seriousness and frequency of offending. Such a measure for

the dependent variable clearly renders more information than is provided by dichotomous measures, or by any single continuous measure. This research included both dichotomous and continuous measures of recidivism. As described earlier, 21 recidivism variables were collected from 2 independent sources. In addition to the binary recidivism variables for the general, violent and nonviolent recidivism, a number of other recidivism measures were gathered and their relationship with risk/need factors was explored. Several operational definitions provided a range of ways of operationalizing recidivism, including concepts of frequency, diversity, severity, and violent reoffending. It has to be said here that the continuous variables were important, allowing for evaluation of the LSI-OR instrument's correlational validity and made it possible to test certain predictive combinations of LSI-OR variables in a multiple regression mode. The number of (total, violent, and nonviolent) charges (as opposed to convictions) variable was selected as a continuous recidivism variable that was used in multiple regression models to arrive at best predictors of recidivism in youth.

The current research project also utilized a simple dichotomous measure of (general and violent) recidivism. General recidivism was operationalized as any conviction for a new offence, or any re-admission due to a breach or technical violation of release condition. Violent recidivism was defined as any conviction for crime causing harm to another person (e.g., homicide, robbery, sexual assault) and a crime, which does not necessarily involve physical contact with another person (e.g., uttering threats, arson). In accordance with these definitions, the sample was divided into 2 groups, those who had subsequent convictions and those who did not. Using binary (yes-no) recidivism variables for general, violent and nonviolent recidivism, LSI-OR single and combined variables (logistic regression models) were evaluated by using both 2x2 contingency tables (true positive, true negative, false positive, false negative) and the area

under the ROC curves (*AUC*), providing a single, global estimate of the test's diagnostic accuracy.

The latter method helped to bypass several problems related to describing clinical judgments about recidivism (violence) prediction in a way of 2x2 tables, which “conflate intrinsic ability (of the test) to detect future offending with the level of risk (or the threshold) that might prompt one to take action (e.g., to prevent violence)” (Mossman, 1994, p. 588). Thus, it is believed that this particular study has benefited from the use of a single (*AUC*) index, the area under the ROC curve, which provides a global estimate of overall performance of the test (its diagnostic power), independently of the test properties and prevalence rates. It is also of help regarding conclusions about the test's accuracy and generalizability of the results. This is particularly true in case of violence prediction because of the low baserates of violence in the current sample.

Recidivism rates of the current study. The commentary of this section will be centered on general, violent and nonviolent recidivism rates of youth and on their rates of survival. Regarding general recidivism, whenever possible, comparisons will be made between the recidivism rates of the current study and the provincial MCS data (Kathy Underhill, personal communication, November 15 & 17, 2002). Comparisons are usually difficult to make with other recidivism studies because of the various definitions, data sources, and follow-up periods that are used in different studies.

Considering one recent study, a very high risk group of young offenders, as defined by the LSI-OR (30 +), have a probability of general recidivism of 75.0 % in two years (Girard, 1999), while merged high/very high risk (20 +) group of young offenders in the current 3.8-year follow up study have a probability of general recidivism of 80.0%. In the medium risk (11-19)

group, 62.5 % of young offenders recidivated (Girard, 1999) as compared to 51.9 % in the current study. In the low risk (5-10) group 40.0 % of Girard's (1999) young offenders recidivated in comparison to 34.2 % in the current study. Although the same LSI-OR instrument was used on older young offenders in both studies, the terms are not completely comparable since there were a number of differences between the two studies, perhaps the most important being the different lengths of follow up for recidivism. Within the context of a more extensive follow-up time in the current study (3.8 vs. 2.0 years), the rates of return of youths who were classified by the LSI-OR instrument as high/very high, medium, and low risk appear to be somewhat lower in comparison to those of Girard (1999).

The Ministry of Correctional Services (MCS) has conducted its own province-wide recidivism data collection exercise on a cohort of 1, 211 young offenders released from a custody facility following the completion of a custodial order or from community supervision following a completion of a community disposition between April 1, 1992 and March 31, 1993. In total, there were 526 custody releases (43.4%) and 685 community releases (56.6%). Depending on the date of the original release, a follow-up period was from 4.5 to 5.5 years and recidivism was defined as return to correctional supervision on disposition. The above definition was similar to the current study's measure of general recidivism (yes-no), their follow-up period of 4.5 to 5.0 years was of a comparable length, and the data source was the Ministry's offender database (OMS) also used in the current study, making such comparisons suitable.

Regarding the general recidivism of the young offender cohort, 73.7% of the custody offenders and 37.1% of the community offenders' recidivated within 3.8 years follow-up time that ranged from 2.7 to 4.9 years. Considering that the community sample in the current study was relatively small ($n = 97$) and was taken solely from the Northern Ontario's correctional

system, with the female offenders being excluded, the percentage of those who recidivated in the current community sample was very similar to that of the provincial community cohort (35.2%) (MCS, 2002). The recidivism rate of the current custody sample (73.7%) was slightly higher than that of the provincial custody cohort (69.4%) (MCS, 2002). Again, the current custody sample was very small ($n = 57$) and the discrepancy could be accustomed to the radical difference in the number of offenders. Also, the current sample did not include female offenders, and the Ministry's data for the community offenders were not broken down by gender. Therefore, these samples are not completely comparable, despite equivalent recidivism definitions and follow-up periods. It is possible that the exclusion of females accounts for these differences even though they constitute only about 15% of the offender population, because it has been found that female young offenders recidivate at a lower rate than their male counterparts (e.g., general recidivism = 18.6 %, violent recidivism = 4.7 %, nonviolent recidivism = 13.9 %; Girard, 1999).

In explaining the higher recidivism rates in the custody sample, an over-representation of secure custody, as opposed to open custody young offenders could have increased the resulting recidivism rate, as could have the loss of data from female and short sentenced offenders if indeed they were disproportionately low risk offenders. Finally, one must consider the possibility that the recidivism rates for Caucasian male custody offenders in northern Ontario may be higher than in the rest of the province.

With respect to male young offenders, their recidivism rate in the province of Ontario was 59.4% (MCS, 2002). In comparison to such a recidivism rate across the province, the entire current sample of male young offenders recidivated at a much lower rate (50.6%). The current study was also compared with another recently completed northern Ontario 6-month recidivism study by Jung and Rawana (1999) in which, in six months, the male offenders recidivated at a

more rapid pace than males from the current study, at 30.7% as opposed to 22.8%, respectively. Thus, in spite of the fact that the custody offenders were over-represented in the current study, the recidivism rates for the entire sample of male young offenders were lower from the provincial average and from other recent studies. One may wonder whether an exclusion of aboriginal youth, who tend to recidivate at the higher rate in comparison with nonaboriginal offenders (75.4 % versus 48.5 %, respectively; MCS, 2002) and are over represented within the Northern Ontario corrections, was not responsible for the difference.

As for violent recidivism, the percentage of youth with the violent index offence (22.1%) was similar (chi-square analyses) to the percentage of youth who re-offended violently within a 4-year period, which was 20.1%, although they were not necessarily the same youth, as illustrated by the following. While 28.1% of the custody young offenders had a violent index offence, also 28.1% recidivated with violent offence, but 18.6 % of the community young offenders had a violent index offence whereas only 15.5 % recidivated with violent offence. Thus, the percentage of young male offenders in custody who engaged in violence continued unchanged over the follow-up period, while the percentage of young offenders in community diminished slightly, albeit not significantly.

Analyses of violent recidivism were useful in showing that the two groups of young offenders (custody and community) engaged in violent recidivism similarly, as per the following measures of violent recidivism: (1) violent recidivism (yes-no) and (2) total number of violent convictions. However, they differed in how they engaged in violent recidivism in terms of (3) the total number of violent charges they received during the 3.8-year recidivism follow-up period. Specifically, the custody offenders received significantly more violent charges than did the community offenders. Thus, although custody offenders were not found to be significantly more

violent than their community counterparts at index offence (i.e., had similar number of violent offences), they were more frequently charged with violent offences than community offenders during the follow-up period. Upon admission, the initial (index offence) custody-community difference was traced to the number of nonviolent convictions but there was no significant difference between their violent offending and severity of their index offence.

In review of the entire sample's performance regarding the number of violent charges outcome variable, 22.1% (34) young male offenders who had one to five violent index charges (mean of .29) and there were 20.1% (31) young male offenders, who had one to six violent recidivism charges (mean of 0.55). In essence, although the number of violent offenders slightly decreased during the follow-up period, the offenders who continued their violent involvement were, on the average, charged with higher number of violent charges, compared to their index offence charges.

As for nonviolent recidivism rates, the percentage of youth with nonviolent index offence (91.6%) had significantly diminished as the percentage of youth who re-offended nonviolently within a 4-year period was 46.8%, although they were not necessarily the same youth, as illustrated by the following. While 96.5% of the custody young offenders had a nonviolent index offence, 68.4% recidivated with nonviolent offence, while 88.7% of the community youth had a nonviolent index offence whereas only 34.0% recidivated with such an offence.

Overall, the analyses of nonviolent offending were useful in demonstrating that although the custody and community groups did not differ initially (at index offence) regarding the proportion of their nonviolent offenders to non-offenders, these groups did engage in nonviolent index offending differentially, as per the number of nonviolent offences. Specifically, the custody offenders were convicted of more nonviolent offences than were the community youth at

their index offence. Regarding their later re-offending, during the 3.8-year recidivism follow-up period, there was a higher proportion of nonviolent recidivists to nonrecidivists found among the custody youth as compared to the community youth and custody offenders held significantly more nonviolent convictions and charges than did community offenders over the 3.8-year recidivism follow-up period.

Survival analyses. Survival analyses afford an opportunity to examine not only the recidivism rates, but also the rate at which such recidivism occurs and to do so, comparatively, between offenders at different LSI-OR risk levels over the 3.8-year follow-up period.

By focusing on general, violent and nonviolent recidivism (yes-no) events in survival analyses, the popular concentration on separate prediction of violence and nonviolence was followed, although it has been suggested (Gendreau Goggin, & Smith, 2002) that a specific focus on violence prediction does not necessarily further one of our principal goals, the protection of the public. This is because only very few offenders have exclusively violent records, while the majority of offenders with a single violent offence have numerous nonviolent convictions. Also, many offenders who have a majority of nonviolent convictions may be classified as high risk, incurring tremendous costs for society (Gendreau, Goggin, & Smith, 2002).

The survival analyses were performed on the collapsed sample of 154 young offenders because of the small number of participants in the custody subgroup ($n = 57$) and because the general, violent and nonviolent recidivists and non-recidivists in the custody group were not distributed in a significantly different fashion than the community offenders across the LSI-OR risk levels. Further, it was in light of the fact that the (general, violent, and nonviolent) recidivists' "time-to-recidivate" did not differ between the LSI-OR Scale's four risk levels (i.e., the very low, low, medium, and high/very high risk categories were included for the entire

sample), so it was decided that adding the time dimension to the existing analysis of recidivism by risk level, which had been done with chi-squares, was futile.

The main purpose for collapsing the custody and community samples was to carry out one overall survival analysis by the four LSI-OR risk levels (i.e., as stated earlier, high and very high risks were merged). The rationale was to place all the Caucasian male young offenders from Northern Ontario, adjudicated by the courts to either custody or community, together, controlling for an identified starting point when they were all eligible to re-offend and for a clearly defined and uniform end point (Norman & Streiner, 1999). This allowed for an investigation of their survival rates (curves) by LSI-OR four risk levels, though the results could have been somewhat less remarkable due to the inclusion of the custody sub-sample.

In general, for all three types of recidivism (general, violent and nonviolent), the main effects of survival analyses' comparisons were positive, indicating that there was a differentiation between survival probabilities by the LSI-OR risk categories, in that the higher the LSI-OR risk level was associated with the lower survival probability, confirming the original hypothesis. However, the comparisons of the mean survival time between risk categories and the Breslow statistic helped to establish that, except for the merged high and very high-risk category, which generated a survival curve that was unlike all other curves, the remaining survival curves were less differentiated.

Differentiation between risk levels was less pronounced for violent recidivism than it was for nonviolent recidivism (i.e., based on the Breslow statistic and overlapping CI's between the very low and low risk mean survival times for violent recidivism). Regarding general and nonviolent recidivism, while the high and very high-risk groups were collapsed because of their small *N*s, the survival curves of the very low and low risk groups were not significantly

different according to the Breslow statistic, although the CI's for their mean survival time were different. Finally, it was found that the low and moderate groups' survival curves were clearly not different, across three types of recidivism. In other words, except for the high/very high group, it is common for the survival curves of adjacent risk groups to be not significantly different from each other.

The Predictor Measures: The Level of Service Inventory-Ontario Revision

Reliability and temporal stability. In keeping with the fact that different kinds of reliability estimates may be required for different kinds of scales (Green, 1992), several estimates were produced for the LSI-OR instrument. Internal consistency reliability was appropriate for homogeneous scales such as the LSI-OR Sections and Section A's eight subscales. The internal consistency estimate for the independent items in Section A of the LSI-OR (Cronbach's alpha $r = .89$) was slightly below that reported by Girard (1999) with her large sample of mostly adult male offenders ($r = .91$) and slightly above that of the PCL-R ($r = .87$; Hare, 1991).

Inter-rater reliability (agreement between two independent raters) and temporal stability (test-retest correlations over time) were also assessed but, because of the naturalistic aspect of the data collection for this study, were confounded with each other, since subsequent assessments were conducted by different assessors at different periods of time. Consequently, reliability coefficients (Pearson's r and Spearman's Rho) were computed for two test-retest intervals since it was anticipated that reliabilites would be expected to decrease over time because of the dynamic aspect of many LSI-OR items.

Inter-rater reliability was strong as represented by Pearson's r of .75 for the General risk/need factor's total score between Time 1 and Time 2, based on 37 participants who had

subsequent assessments within the period of 12 months from the first assessment (Table 18).

There were no participants re-assessed within the one-month period from the first assessment, and only three participants were found whose re-assessments occurred within the three-month period. Therefore, this result cannot be simply compared with Girard ($r = .88$) or with the PCL-R ($r = .89$; Hare, 1991) one-month inter-rater reliability coefficients. This is because the current inter-rater reliability coefficient is based on 37 correlations where re-tests were completed within the period of 43 days to 12 months from the time of the first assessment. One may speculate that if there had been more individuals within the short inter-test interval, then, the inter-rater reliability coefficient could have been larger.

As for the temporal stability reliability, simple correlations were produced, taking place of initially attempted Kappa measures of nonchance agreement, due to reduced n and lack of symmetry for the LSI-OR risk levels utilized at test-retest times, during certain (differing in length) intertest intervals. The overall LSI-OR total score test-retest coefficient was moderate, $r = .63$, which is not necessarily a psychometric problem for the instrument since there was a wide span of inter-test time, from 43 to 754 days, and true client changes should be captured by the many dynamic items in the LSI-OR. This effect of dynamic changes in offenders is reflected in decreasing reliability of the LSI-OR total score over time, its coefficient of .75 for the shorter test-retest period (43 to 365 days) having become weaker, that of .53, for the longer (366 to 754 days) intertest interval.

Similar pattern of decline over time was seen in the current study for the four levels of initial and final risk and for the Specific risk/need section of the LSI-OR Scale. For the entire intertest interval (43 to 754 days), the initial and final LSI-OR risk systems produced coefficients of .53 and .51, respectively, only slightly lower than that reported by Girard (1999; $r = .58$) with

adult offenders. The effect of decreasing reliability for the LSI-OR major predictors over the 12-month intertest interval was detected, and was especially strong for the initial risk, along with the Specific risk/need factors total, both correlations having become evidently smaller and not significant during the longer intertest period. Regarding the final LSI-OR risk, (which was based on the use of 'override' by the assessors), its short test-retest interval's coefficient of .61 diminished to .47 for the longer intertest interval, but remained significant and larger than the initial risk's coefficient for the longer delay group. Since the final risk's r is (somewhat) larger than the initial risk's r for the long delay group, it may suggest that the override is being used to bring the risk level more in line with the first risk level. However, information is unavailable as to whether or how many of these retests in either interval group are blind to the previous test and, therefore, there is no attempt being made to clarify this point at this time. Future investigation of the LSI-OR Scale's re-assessment process is recommended.

Finally, only the Strengths variable of the LSI-OR instrument did not show a declining pattern for the increased intertest period, but it had nonsignificant inter-rater reliability indices for both time intervals. Essentially, within the context of the Strengths poor association with recidivism variables of the current study, the question becomes whether the assessment of strengths in young offenders is reliable even if another assessor carries out re-assessment after a short period of time from the first assessment. A future investigation of the LSI-OR Scale's assessment of young offenders' strengths is in order.

In summary, systematically decreasing reliability over time indicates that the LSI-OR instrument is sensitive to dynamic changes, which, in this case, could have been registered as actually greater than what would have occurred naturally, because mostly staff had the results of the first LSI-OR. However, the more immediate test-retest reliability for the Strength dimension

was very poor and suggests that more attention should be devoted to its scoring, possibly improving the manual directions and addressing this concept of strength and its measurement in staff training.

Synchronous with the realization that “assessment of reliability is more complicated when behavior changes over time” (Green, 1992, p. 143), future research would do well to reassess the LSI-OR instrument’s inter-rater reliability based on more immediate test-retest of a larger sample of young offenders and compare it with reliability changes over time.

Construct/structural validity. A test has construct validity if the concepts it is said to measure (e.g., static and dynamic correlates of recidivism in the case of the LSI-OR) can be shown to make scientific and conceptual sense (i.e., in accordance with social learning theory) for the specific population of interest (i.e., the population of young offenders). The term structural validity is equally important as it is used to imply that a measure has item content and a corresponding factor structure that are representative of and consistent with what is currently known regarding a construct (Reise, Waller, & Comrey, 2000).

In evaluating the LSI-OR’s construct and structural validity, exploration of its generalizable factor structure that would replicate across samples was required. An Exploratory Factor Analysis (EFA) was selected as a method of exploration and care was taken to select statistical options that were potentially less troublesome from the viewpoint of generalizability of the factor structure (Reise, Waller, & Comrey, 2000). It is of note that, for instance, the default options in the widely popular Statistical Package for Social Sciences (SPSS) provide principal-component analyses (PCA), the Keiser rule of eigenvalue greater than 1.0 to retain factors, and varimax rotation to simplify structure, which are potentially troublesome procedures if a

researcher is looking for a generalizable factor structure (Reise, Waller, & Comrey, 2000).

Hence, no such default options were relied upon in the current research.

Instead, Exploratory Factor Analysis (EFA) was used, with a scree plot combined with the Norman-Streiner formula for determining the optimal number of factors to be retained. Further, oblique rather than orthogonal solution was utilized, with the factors not being constrained to be uncorrelated. But a compelling reason for using oblique rotation was that it would still produce orthogonal solution if an orthogonal (simple) solution was appropriate (Reise, Waller, & Comrey, 2000). Since the LSI-OR data did not meet the assumptions of a simple structure, with many of the LSI-OR variables being complex and tapping into more than a single trait, choosing a simple orthogonal solution was deemed inappropriate. However, the EFA procedure used in the current study is theoretically defensible, reliable and should be replicable.

Based on the SPSS default (Keiser) rule, nine factors initially emerged but were rejected, because they did not meet the pre-established criteria for optimal factor composition. Subsequently, EFA was replicated, forcing a two-factor oblique solution, which accounted for the two latent variables (factors) as necessary to explain the correlations (common variance) among the LSI-OR Section A's 33 unique items. These latent variables were labeled Static Factor and Dynamic Factor. The former was composed of items that clearly reflected a common underlying static (historic) domain, while the latter was a mix of the dynamic LSI-OR items. Interestingly, these two Static and Dynamic factors were robustly and significantly intercorrelated at .32, demonstrating that static (historic) phenomena also have a dynamic dimension to them, as reflected in the case of 'Law violations due to substance abuse' item, which loaded on both factors, even more so on the Dynamic than on the Static one.

This LSI-OR two-factor structure is expected to be replicable and generalizable to other young offender populations when factor analysis, in contrast to the principal-component analysis (PCA), is utilized. These factors are also consistent with the general offender risk assessment literature that categorizes offender risk items into dynamic and static risks (Andrews & Bonta, 1998; Gendreau, Little and Goggin, 1996; Cottle, Lee, & Heilbrun, 2001). Therefore, the results confirm the construct and structural validity of the LSI-OR instrument with a group of (older) Caucasian male young offenders from Northern Ontario.

LSI-OR general risk/need factors and recidivism. A central feature of any test's validity is the correlation of the test with some other criterion behavior of interest or relevance to the underlying construct, in this case recidivism (Green, 1992). Specifically regarding the LSI-OR instrument's usefulness for the purposes of risk management, it must not only provide the assessor with information about the offenders' needs but it must be able to evaluate the probability of future criminal behavior (Quinsey & Walker, 1992). Modern literature indicates that the best predictors of recidivism would be a combination of static and dynamic variables, representing the four areas of antisocial cognitions, antisocial associates, history of criminal and antisocial behavior, and antisocial personality (The "Big Four" predictors), substance abuse problems, employment difficulties, problems with family, peers and leisure time problems (minor predictors). These would be a few essential indicators, which could be named (Andrews & Bonta, 1998; Simourd & Andrews, 1994; Hoge, Andrews, & Leschied, 1995; Gendreau, Goggin, & Little, 1996; Cottle, Lee, & Heilbrun, 2001).

The relationship between the LSI-OR and recidivism will first be described by reviewing the General risk/need factors and its relationship with various measures of recidivism. According to the current findings, the General risk/need factors' total score proved to be highly associated

with the binary General recidivism outcome variable ($r = .46$) as were the LSI-OR two higher-order (derived) variables, the Static and Dynamic Factors ($r = .44$ and $r = .37$, respectively). As reported earlier, these two factors were intercorrelated at .32, (oblique rotation was utilized), which indicates a natural overlap between static (historic) and dynamic (changeable) risk/needs in young male offenders as suggested by Rice, Harris, & Quinsey (2002). This finding makes a contribution to the discussion that has taken place in the field, regarding these two domains, static and dynamic, since such (static-dynamic) comparisons are another way of examining the eight LSI-OR predictor domains (Gendreau, Little, & Goggin, 1996). Also, the question of the incremental validity of dynamic predictors is important as it is relevant to the idea that various attitudes, values, and intentions must be evaluated for valid pre-release risk assessment (Rice, Harris, & Quinsey, 2002).

The Static and Dynamic factors correlations with recidivism in the current study are relatively similar to each other, as they were in the Gendreau et al. (1996) meta analysis. However, they are much higher than his mean r 's of .12 for static variables and .15 for dynamic variables when examining studies of both adult and young offenders (i.e., $r = .44$ and $r = .37$, respectively).

The General risk/ need factors of the LSI-OR instrument also proved to differentiate recidivists from nonrecidivists. Analyses revealed that recidivists had significantly greater mean scores on six of the eight General risk/need factor (Section A) subscales, all of which have been identified in the criminological literature as the best predictors of criminal behavior (i.e., four major and four minor predictors). However, the Family/marital and Substance abuse subscales were not associated with the main recidivism variables of the current study. This is inconsistent with the literature to date and with the recent findings regarding risk factors for juvenile criminal

recidivism in that problems in family and school, along with other problems (e.g., substance abuse) distinguish those juveniles who reoffend and adjust poorly in the community from those whose outcomes are more favorable (Heilbrun et al., 2000; Cottle, Lee, & Heilbrun, 2001).

When recidivism was defined as any new conviction (yes-no) for a new offence or for a technical violation/breach of probation order, the General risk/needs factors' total score correctly predicted 65.4 % of the recidivists (true positive rate = TPR) and 72.4 % of the non-recidivists (true negative rate = TNR), demonstrating somewhat higher levels of specificity (probability that the test will be negative for nonrecidivists) than sensitivity (probability that the test will be positive for recidivists).

Although TPR and TNR (or false positive rate = FPR) are the best measures for summarizing the data in 2x2 tables, they may not necessarily be the best way to portray and compare intrinsic properties (accuracy) of diagnostic tests, for example due to differences in prevalence rates or changes which can be produced in the 2x2 tables' values by varying the sequence of the test (Mossman, 1994). Mossman contends that even though probation officers or clinicians are asked whether someone will recidivate or not in binary terms, and they often have to make yes-or-no judgment-based decisions about offenders, they probably categorize assessed people (offenders) into more than two anticipated likelihoods or levels of risk for recidivism (violence). The results of actuarial methods reflect levels (degrees) of confidence about the outcome and it makes sense to use the receiver operating characteristic (ROC) analysis, which offers a means for portraying the accuracy of recidivism (violence) assessments where the relationship between level of risk and decision choice can be perceived (i.e., by considering trade-offs between sensitivity and specificity, which are the defining features of most recidivism detection methods).

The area under the ROC curve (*AUC*) provides a single, global estimate of overall performance of a test and it was utilized to evaluate the performance of the General risk/needs factors section (total score) in prediction of general recidivism. For the total sample, the area under the ROC curve yielded a quantitative index of the test's high diagnostic accuracy (*AUC* = .77), as it did for the derived from Section A's two-factor (Static-Dynamic) model (*AUC* = .79). To summarize, in comparing the above models, the two-factor model has higher diagnostic accuracy in prediction of general (yes-no) recidivism in youth. It slightly outperforms the General risk/need total score as the sole predictor of general recidivism in youth. It comes as no surprise that the items combined into factors, (utilizing the best weighting), have slightly higher *AUCs*, in comparison to the single variable model. In essence, ROC analyses, and the areas under the curves (*AUCs*) they yield, indicate large-sized effects between the General risk/needs factors (Section A) and general recidivism of youth. The range of *AUCs* for the General risk/needs factors' variables, on the total sample of young offenders in the current study, (.77 to .79), compare favorably to those found in other recidivist studies (Kroner & Mills, 2001; .60 to .75; Catchpole & Gretton, 2003; .74 to .78).

Section A performed very well in the prediction of binary general recidivism, along with Location and Responsivity considerations' section, each of which made a unique contribution to the model, above and beyond that of the other variables in the model. Regarding the LSI-OR Section A's performance in predicting the total number of charges continuous recidivism variable, the General risk/needs factors section was the only LSI-OR section, which demonstrated incremental predictive validity, uniquely accounting for 10.4 % of the variance in recidivism after the initial differences due to Location (custody - community) were held constant.

Furthermore, in the eight-subsection model of total charges, the General risk/need factors' two predictor subscales - Criminal history (A1) and Leisure/recreation (A4) - uniquely contributed to the model, controlling for the effects of other variables in the equation, including Location and the Big Four major predictors. The most predictive variable in the eight-subsection model, the Criminal History subsection, was the strongest predictor of general recidivism, as represented by the number of charges (Andrews & Bonta, 1994; 1998; Cottle, Lee, & Heilbrun, 2001). It points to the fact that historical data are extremely important predictors of general recidivism in youth and that, also, the youth's leisure patterns are uniquely associated with their future recidivism (number of charges). Unexpectedly, the other three Section A's major predictor subscales, Companions, Procriminal attitudes and Antisocial patterns (personality), did not make unique contributions to the model. The other three minor predictor subscales did not meet the criteria for entry to the final model of total number of charges (Education/employment, Family/marital, and Substance abuse). However, caution should be exercised in interpreting or generalizing these results to other populations, as they illustrate the predictors of total number of charges for this sample of Caucasian, male youth from Northern Ontario.

The capacity of the LSI-OR to predict violent recidivism has been of great interest to both researchers and practitioners. When violent recidivism was defined as any new violent conviction (yes-no), the General risk/needs factors' total score was highly associated with binary violent recidivism ($r = .31$) as were the LSI-OR two (derived) higher-order variables, the Static and Dynamic Factors ($r = .23$ and $r = .24$, respectively).

Further, the General risk/need factors' section was the only LSI-OR section that contributed uniquely to the prediction of binary violent recidivism. The five-section logistic multiple regression model's predictive power was reflected in the test's true positive rate (TPR)

of 9.7 % and true negative rate (TNR) of 97.6 %. Therefore, the model's specificity (probability that the test will be negative) was considerably much higher than its sensitivity (probability that the test will be positive). Overall, it is a good sign, showing an emphasis on protection of society, though it over-predicted violence at 50.0 %, while over-predicting nonviolence at 21.9 %. Any enthusiasm for success is tempered by the knowledge that while this measure, not unlike other violence risk measures, correctly identified 3 (of 6 of those predicted to be recidivists) young offenders as high risk (true positives), it bore the cost of misidentifying 28 (false negatives or 'misses'). Importantly, 3 individuals were misidentified as future recidivists (false positives), and may be "needlessly detained or otherwise restricted" (Webster, Harris, Rice, Cormier, & Quinsey, 1994, p. 2).

Only Section A made a unique contribution to the prediction of violent recidivism yet, its use in the multiple regression-derived (weighted) combination of location variable and five sections, resulted in the model with a high intrinsic diagnostic accuracy in prediction of violence in young offenders ($AUC = .74$), a slightly (2.1 %) improved model over the one with Section A total as a sole predictor of violence. It was also improved (by 2.9 %) in comparison to the Static-Dynamic factor model. The current results are nearly as high as ones obtained by Douglas and Webster (1999) for the HCR-20, a diagnostic scheme specifically geared to violence prediction in adults ($AUC = .76$ for physical violence in the community; $AUC = .80$ for violent offences of psychiatric patient followed for 2 years in the community), indicating that the LSI-OR General risk/needs factors' section is intrinsically well equipped to predict violence in young offenders. The current results are as high as the results of Catchpole and Gretton (2003), who recently examined the predictive ability of the Youth Level of Service/Case Management Inventory (YLS/CMI, Hoge & Andrews, 2002) along with the Structured Assessment of Violence Risk in

Youth (SAVRY), and the Psychopathy Checklist: Youth Version (PCL: YV). Their results were obtained on mostly male and previously violent young offenders, and their AUCs for the three instruments were all .73.

Furthermore, in predicting the number of violent charges' recidivism variable in the current sample of young offenders, Section A was again the only LSI-OR section that contributed to the model, uniquely accounting for 3.9 % of the variance in violent charges, after initial differences due to Location were held constant.

Finally, in predicting violent charges of youth, the General risk/need factors' two predictor subscales -- Criminal history (A1) and Education/employment (A2) - uniquely contributed to the model, controlling for the effects of other variables in the equation, including Location and the Big Four major predictors. The most predictive variable in the eight-subsection model, the Criminal history subsection, was the strongest predictor of violent recidivism, as represented by the number of violent charges (Andrews & Bonta, 1994; 1998; Rice, Harris, & Quinsey, 2002; Cottle, Lee, & Heilbrun, 2001). These results show that, in predicting violence of male youth, it is essential to rely on criminal history data, combined with the very important dynamic education/employment-related factors, since these factors have a unique association with future violent charges of youth under study. This combination of Static and Dynamic predictors of violence points to the importance of considering the adolescent's past history of harmful aggression, anger, impulsivity and lack of empathy, which should be considered as important components of "antisociality in juveniles" (Duncan et al, 1995, p. 256; Grisso, T. 1998). A past history of criminal and antisocial behavior, combined with education/employment failure, plays the strongest role in the prediction of violent recidivism of youth under study.

Unexpectedly, the remaining three Section A's major criminal behaviour risk predictor subscales, Companions, Procriminal attitudes and Antisocial patterns (personality), did not make unique contributions to the model. The remaining three minor predictor subscales did not meet the criteria for entry to the final model of total number of charges (Family/marital, Leisure/recreation, and Substance abuse). Caution should be exercised in interpreting or generalizing these results to other populations, as they illustrate the predictors of total number of charges for this sample of Caucasian, male youth from Northern Ontario.

As for nonviolent recidivism, defined as any new nonviolent conviction (yes-no), the General risk/needs factors' total score was highly associated with binary nonviolent recidivism ($r = .43$) as were the LSI-OR two (derived) higher-order variables, the Static and Dynamic Factors ($r = .42$ and $r = .36$, respectively).

Further, the General risk/need factors' section made a unique contribution to the five-section model of binary nonviolent recidivism, above and beyond other significant variables in the model, those of Location (custody-community) and Responsivity considerations. The area under the ROC curve for the five-section model of nonviolent recidivism was substantial (AUC = .79), indicating the high diagnostic accuracy of the model, with Section A being one of the three essential predictors. Interestingly, this model provided 4 % improvement in predictive accuracy over the LSI-OR total score-based model and 1.2 % improvement over the model with the two combined, Static and Dynamic, factors.

The General risk/need factors section was the only LSI-OR section that contributed to the model of nonviolent charges, uniquely accounting for 32 % of the variance in nonviolent recidivism after the initial differences due to location were held constant.

Finally, in predicting nonviolent charges of youth, the General risk/need factors' two predictor subscales -- Criminal history (A1) and Leisure /recreation (A4) – uniquely contributed to the model, controlling for the effects of other variables in the equation, including Location and the Big Four major predictors. The most predictive variable in the eight-subsection model, the Criminal history subsection, was slightly more robust than the Leisure/recreation variable. These results show that, in predicting nonviolent recidivism of male young offenders, it is essential to rely on criminal history data, combined with the very important dynamic leisure/recreation-related factors, since these factors have a unique association with future nonviolent charges of youth under study. A past history of criminal and antisocial behavior, combined with leisure/recreation interests and patterns, play the strongest role in the prediction of nonviolent recidivism of youth under study.

Unexpectedly, the remaining three Section A's major predictor subscales, Companions, Procriminal attitudes and Antisocial patterns (personality), did not make unique contributions to the model. The remaining three minor predictor subscales did not meet the criteria for entry to the final model of total number of charges (Family/marital, Education/employment, and Substance abuse). Caution should be exercised in interpreting or generalizing these exploratory results, as they are statistically-driven and illustrate the best predictors of violent charges for the current group of Caucasian, male youth from Northern Ontario.

These results show the most important predictors of violent and nonviolent recidivism of youth. The following were its strongest predictors: Criminal History and Leisure/recreation for general recidivism, Criminal history and Education/employment for violent recidivism, and Criminal history and Leisure/recreation for nonviolent recidivism. In summary, the above results are encouraging as they show the LSI-OR General risk/needs factors' high diagnostic power,

utility and versatility in prediction of general, violent and nonviolent recidivism in older young offenders.

However, the General risk/need section's eight subscales did not equally well differentiate recidivists from nonrecidivists across the subgroups of interest, by (custody-community) location.

In the custody sample, the findings were surprising, because none of the General risk/need factors were able to differentiate between recidivists and nonrecidivists, including the General risk/need factors total and Criminal history subsection's variables. There could be one plausible explanation as to why the LSI-OR instrument would be unable to capture the difference in needs of the custody offenders who recidivated and those who did not. The majority of the custody offenders consisted of adolescents who were of high/very high risk and who later re-offended ("base rate problem"). Given the nature of the custody sample in this analysis, it is likely that these participants have a history of substance use, academic problems, family instability, as well as prior experience with treatment programs. Therefore, such variables may have diminished discriminative power because of the somewhat restricted range within a rather homogeneous sample. However, this contention cannot be fully supported, despite the variance (*SD*) of the LSI-OR scores being to some extent lower, since it is not significantly smaller for the custody offenders than for the other groups of youth.

In spite of the above, when the location variable (custody-community) and the five LSI-OR sections were linearly combined, the model's intrinsic diagnostic accuracy was very high on the general binary recidivism measure ($AUC = .80$), with the following contributing variables: Location, General risk/need factors, and Responsivity considerations. Essentially, it means that an offender's location upon disposition, along with the risk/needs items of Sections A and G, are

highly accurate in their diagnostic prediction of general recidivism of young offenders. In the model, the Location variable's positive coefficient of 0.958 leads to an increase in the likelihood ($\text{Exp (B)} = 2.608$) of being in the group coded 1 for general recidivism. In this case, the Exp (B) value of 2.608 can be interpreted as being 2.61 times as likely for the custody offender to become a recidivist rather than a nonrecidivist, compared to the community offender, just based on the predictive power of the Location variable alone. However, regarding Section A's eight subsection model in prediction of general recidivism as represented by the Number of charges (total), location variable lost its predictive power, becoming redundant to Criminal history and Leisure/recreation predictor subscales.

For the community group, recidivists scored significantly higher than nonrecidivists on the following three out of the eight General risk/need factors' subsections: Education/employment problems, Leisure/recreation habits, and Antisocial pattern (personality). The LSI-OR Section A, along with Section G, was one of the two sections, which discriminated community recidivists from nonrecidivists. This is consistent with the correlation coefficients, showing that the General risk/need factors, along with the Responsivity concerns outperformed all other LSI-OR Sections in terms of their association with the existing recidivism variables. As predicted, the LSI-OR Section A performed better than did Section B, for all three types of binary recidivism and also for the number of convictions and charges' outcome variables.

Also, Section A's total score showed high diagnostic accuracy in prediction of all three types of binary recidivism in the community sample. The ROC analyses showed that the General risk/needs factors' section has equally high diagnostic accuracy to predict general and violent recivism ($AUC = .76$, for both). Its diagnostic accuracy to predict nonviolent recidivism was also high but to a lesser degree ($AUC = .72$). The Static and Dynamic LSI-OR factors, which were

derived from Section A's items, similarly showed moderately high to high power for recidivism prediction, respectively. They were highly accurate in assigning those who would recidivate to the recidivist category and those who would not recidivate to the nonrecidivist category, whether it was general, violent or nonviolent recidivism.

In summary, as originally expected, Section A's unique performance for the community sample was very robust and stronger than that of the Specific risk/needs factors' performance. Surprisingly though, correlational and ROC analyses showed that the Section A's performance for community youth was rivaled by Section G's outstanding performance.

Other LSI-OR variables and recidivism. The relationship between the other LSI-OR sections (B, C, F, and G) and recidivism will now be reviewed. Commentary on the LSI-OR classification scheme, strengths as portrayed in the LSI-OR, and the use of the override function will follow.

In addition to the General risk/needs factors (Section A), the Specific risk/need factors (Section B), the Personal problems with criminogenic potential (Subscale B1), and the Special responsivity considerations (Section G), differentiated recidivists from nonrecidivists for the total young offender sample. Regarding Section B, its total score discriminated between violent recidivists and nonrecidivists, while its Subscale B1 (Personal problems with criminogenic potential) discriminated between both types of recidivists and nonrecidivists, general and violent. This was unlike the History of perpetration subscale (B2), which did not differentiate between either group of recidivists and nonrecidivists on their mean scores and on their percentages across a recidivist–nonrecidivist domain.

More specifically, the three items from Subsection B1, which differentiated recidivists from those who did not recidivate, were in descending order, Problems with compliance,

Problem-solving/self-management skill deficits, and Peers outside the age range. These items' correlations with the general, violent and nonviolent (binary) recidivism variables were especially strong for the Problems with compliance (.34, .24, and .29, respectively), Problem-solving/self-management skill deficits (.19, .22, and .20) and Peers outside the age range (.21, .22, .20), respectively.

These variables are worthy of mention, as their findings are consistent with other literature regarding risk factors for juvenile criminal recidivism in that a general pattern of noncompliance, limited problem-solving ability and inability to self-regulate, have been linked to delinquency (Kazdin, 1995; Myner, Santman, Cappelletty, & Perlmutter, 1998). In the Myner et al study, 58%, 19%, and 18% of the sample were diagnosed with conduct disorder, ADHD, and ODD (oppositional defiant disorder), respectively.

Findings regarding Section B performance with adult offenders (Girard, 1999) indicated its straightforward relationship with violent recidivism, which is less obvious in the current study, although simple correlations between Section B total and the various measures of recidivism indicate significant associations with violence (yes-no), $r = .28$, and with other related recidivism variables, such as the most serious offence and total number of violent charges ($r = .24$ and $.25$, respectively). Also, the ROC estimate of the Section B intrinsic diagnostic accuracy in prediction of binary violent recidivism was high ($AUC = .71$), while on general and nonviolent recidivism its estimates were only low to moderate ($AUC = .64$ and $.62$).

Analyses also revealed that recidivists had significantly greater mean scores on Special Responsivity (Section G) related concerns. Specifically, Section G total discriminated between recidivist-nonrecidivist proportion across the three types of recidivism due to the following two items' discriminatory capacity, Motivation as a barrier and Enagages in denial/minimization. The

former was highly correlated with the general, violent, and nonviolent (binary) recidivism variables (.44, .37, and .37, respectively), while the latter showed significant correlations only with the general and nonviolent (binary) recidivism variables (.20 for both). Finally, the Special responsivity considerations (Section G total) correlated at .45 with general recidivism, and at .24 and .30 with violent and nonviolent recidivism (yes-no), and the ROC estimates of its intrinsic diagnostic accuracy were moderate to high, ROC AUCs of .68, .67, .65, respectively.

As for the Prison Experience (Section C) and Other Client issues (Section F), their totals and the majority of their items did not demonstrate associations with the recidivism variables and did not discriminate between the (general, violent and nonviolent) recidivists and nonrecidivists. This is except for one Section F item, which had enough power to discriminate between the recidivists and non-recidivists: Other evidence of emotional distress (item F1/12), which showed a small to medium association with the general and nonviolent recidivism at .19 and .22, and no association with the violent recidivism. Accordingly, the ROC estimates of the LSI-OR Sections C and F predictive power for the general, violent and nonviolent recidivism were low and mostly not significant (except for, specifically, Section F with general and nonviolent recidivism).

The ability of the LSI-OR Sections B, C, F, and G, linearly combined, to predict the likelihood of the general (yes-no) recidivism, controlling for the offenders' initial location (custody-community) and for the Section A's effects on recidivism, was assessed. Overall, the Special responsivity considerations (Section G) made incremental predictive contribution to the final model of general recidivism. The area under the ROC curve ($AUC = .80$) indicated that the final five-section model was highly accurate in the prediction of general (yes-no) recidivism in youth.

The finding that Section G demonstrated incremental predictive validity when combined with the other sections, is inconsistent with the assertion expressed in the original hypothesis that the LSI-OR Sections A and B are the main independent variable set that makes a significant contribution to the LSI-OR five-section model of general recidivism. However, it is evident, that for the young male offenders from the current sample, the motivational factors and problems related to denial and minimization are the principal responsivity issues that have a unique relationship with the offenders' future (general and nonviolent) recidivism, after the offender's location and Section A-based needs are accounted for.

The performance of Section G was less spectacular in the prediction of total charges continuous outcome variable, however. When it was linearly combined with the other LSI-OR sections, after the offenders' initial location and the Section A's effects were controlled for, it did not meet the criteria for entry into the equation.

When the ability of the LSI-OR Sections' B, C, F, and G, linearly combined, to predict the likelihood of violent (yes-no) recidivism were assessed, after the offenders' initial location (custody-community) and Section A's effects on recidivism were accounted for, none of them demonstrated incremental predictive validity. Regarding recidivism defined as the number of violent charges, none of the LSI-OR Sections B, C, F, or G, was allowed to enter the equation after the Section A was accounted for. Neither the offenders' location nor the originally hypothesized Section B was a significant predictor of violent recidivism in youth.

When the LSI-OR five-section model was tested in the prediction of nonviolent (yes-no) recidivism, the offenders' initial location (custody-community), Section A and Section G, all made unique contributions to the model. This model showed a high diagnostic accuracy ($AUC = .79$) in predicting nonviolent recidivism (yes-no) of young offenders. However, regarding

recidivism defined as the number of nonviolent charges, none of the LSI-OR Sections B, C, F, or G, was allowed to enter the equation after the location and Section A were accounted for. This exemplifies the fact that the LSI-OR Special reponsivity concerns (Section G) performed unexpectedly well in prediction of general and nonviolent binary recidivism, but not when recidivism was operationalized as a quantitative variable (number of charges).

The five sections of the LSI-OR instrument did not differentiate recidivists and nonrecidivists equally well across the subgroups of youth identified by location (custody-community).

The relationship between the LSI-OR's five sections and recidivism of the custody youth can be summarized as being surprisingly poor, whereas it was relatively strong for the community offenders. The custody group's correlation coefficients between the LSI-OR variables and recidivism were inadequate and did not substantiate their predictive value. The majority of the ROC indices for the LSI-OR Section associations with the selected recidivism variables were in the low to low-moderate range for this group, with the exception of the Static factor's high diagnostic predictive value for the general and nonviolent recidivism (*AUCs* of 72, 73, respectively). Once again, these findings suggest the importance of the static (historic) component of the LSI-OR instrument for the prediction of general and nonviolent recidivism in youth who were placed in custody. Unexpectedly, the dynamic LSI-OR factor had no significance in the prediction of future recidivism (violence or nonviolence) for the custody offenders. Therefore, the instrument may not work well for this group of young male offenders because it does not appear to capture their dynamic needs, as both Section A and Section B, along with all other LSI-OR sections, do not have intrinsic diagnostic accuracy in prediction of recidivism of young male offenders who were institutionalized.

The community offenders' correlation coefficients between the LSI-OR variables and their recidivism were robust. The majority of the ROC indices for the LSI-OR Sections with the selected key recidivism variables were in the moderate to high range for this group, especially for the Section A, dynamic LSI-OR factor and Section G, with all three types of recidivism (e.g., *AUCs* of 76, 75, and 72, for general recidivism). The dynamic LSI-OR component predicted not only general and nonviolent recidivism but also violent recidivism very robustly. For the community group, Section B performed with the high diagnostic accuracy in prediction of violent recidivism and Section G was highly predictive of both the general and violent recidivism.

The findings of the current study reveal that the offenders' initial location (i.e., institution or community) had a significant bearing on the odds of their later recidivating (as opposed to not recidivating), an especially high custody-community odds ratio for the general and nonviolent recidivism, when location was a sole predictor. However, when an offender's location was in the linear combination with the LSI-OR variables, the Location's predictive ability became less pronounced for the general and nonviolent recidivism, and not at all significant for the prediction of violent recidivism. In summary, 'Location' (custody-community) variable performed nearly as well as did the LSI-OR Section A in prediction of general and nonviolent recidivism but showed no unique contribution to the model of violent recidivism.

Regarding the young offenders in the community, Section A with its eight subscales was very sensitive to all three types of recidivism, whereas Section B1-based items constituted additional dynamic features associated more specifically with the the violent recidivism. These findings are in accord with dynamic violence predictors in risk assessment across various groups such as mentally disordered (Harris, Rice, & Quinsey, 1993), adult offenders (Girard, 1999) and

juveniles (Cottle, Lee, & Heilbrun, 2001). Besides characteristics related to antisocial personality, other predictors of violence in young male offenders appear to be linked to anger management deficits, problem-solving and self management skill deficits, and peer relationships outside the age range. It is worthy to mention that, the Special Responsivity concerns (Section G), expected to encompass noncriminogenic needs, showed a unique ability to predict general and nonviolent recidivism in the community young male offenders.

LSI-OR risk classification scheme and general, nonviolent and violent reoffending. The classification of risk into five levels in the current version of the LSI-OR was a modification from the three levels of risk that was specified in the previous version of the instrument, the LSI-VI. The increased number of levels was intended to provide practitioners with a more precise and individualized framework for decision-making. However, the use of risk levels (e.g., very high, high, medium, low, and very low) in criminal justice is inconsistent as these terms may mean different things to different people, especially when different instruments are used and when their outcome variables, typically various measures of recidivism, have different base rates (Wormith, 2001). This is also true for young offenders and, therefore, it is important to validate the usefulness of the LSI-OR classification system for this population.

In the current study, there were only four offenders in the very high-risk category. Therefore, it was necessary to collapse the two highest risk levels (i.e., the high and very high groups) into the high/very high category of risk. This resulted in four categories of risk, which were utilized throughout the current study. This represents a departure from both the original instrument (3 risk groups) and the later modification (to 5 risk groups).

For the total sample of 154 male youth, the four risk level categories indicated that 10.5 % of the very low, 34.2 % of the low risk, 51.9 % of the medium risk, and 80.0 % of the

high/very high-risk offenders recidivated. These percentage values pertain to the LSI-OR instrument's initial risk, which was chosen to represent the LSI-OR–recidivism relationship in a more efficient way than was shown by the final LSI-OR risk.

There is robust evidence that, across the four risk levels, the proportion of general recidivists to nonrecidivists is significantly different, rising with an increase of LSI-OR risk level, as originally hypothesized. From the four-level risk system's perspective, the young offenders from the high/very high-risk category reoffended 7.6 times more, than did their very low risk equivalents. This validates the LSI-OR classification system's predictive capability for general recidivism in all young offenders under study, exceeding the recommended recidivism proportion for the highest versus the lowest risk level (Wiebush et al., 1995). Wiebush and colleagues contend that well-designed risk assessment instruments “are typically able to identify a group of high-risk offenders whose probability of recidivating is four to five times greater than the identified low-risk offenders” (Wiebush et al, 1995, p. 177).

Paired comparisons of recidivism percentage across six pairs of risk levels provided somewhat less straightforward results. Except for the high/very high-risk groups, which were different than all other groups, most risk level groups were not significantly different from their adjacent groups, but were different from all remaining groups. Although it might be argued that these findings justify returning to fewer groups, it is suggested that it would be premature yet to do so, due to the small sample size in some of the groups being compared. A smaller number of offenders in the very low risk category could have potentially affected the results ($n = 19$), but this number was appropriately proportionate to the number of offenders who were classified as low, medium, and high/very high LSI-OR risk levels (re: normal curve). Nevertheless, the

current study does provide evidence for the ability of the LSI-OR instrument to differentiate risk for general recidivism in a sample of male youth offenders.

The LSI-OR's strong relationship with the general (binary) recidivism is reflected in ROC AUC of .77 for the LSI-OR Section A total score. This indicates that there is a 77 percent "chance that an individual who recidivated will score higher on this measure than will a nonrecidivist" (Catchpole & Gretton, 2003, p.702). This finding is comparable to those obtained by Catchpole and Gretton (2003) for the two risk measures (the SAVRY and the YLS/CMI) and for the PCL: YV (psychopathy construct), which they validated on violent, male young offenders (mean age of 16 years) in British Columbia. Their ROC AUCs ranged from .74 to .78 for general recidivism. The current AUC for the LSI-OR total score on general recidivism slightly outperformed the YLS/CMI (a version of the LSI that was specifically designed for youth) on general recidivism ($AUC = .74$, Catchpole & Gretton, 2003).

Survival analyses provide further validation for the significant effect between the LSI-OR Scale and general recidivism by affording evidence that the LSI-OR higher risk level is associated with a lower survival probability (*Log Rank*), although differentiation between risk levels is less apparent when survival rates for specific risk level are paired for comparisons. These specific paired comparisons show (in two independent ways) that the high/very high-risk group is differentiated from all other groups, with its own unique survival rate/time, whereas other groups are not that clearly differentiated from one another, some showing no significant difference on either comparison (i.e., the very low and low, and the low and moderate risk groups were not different). The survival rate pattern for the four risk levels was in sync with the recidivism rate pattern for these same groups.

There is robust evidence that, across the four risk levels, the proportion of nonviolent recidivists to nonrecidivists is significantly different, rising with an increase of LSI-OR risk level, as originally hypothesized. From the four - level risk system's perspective, the risk categories indicated that 10.5 % of the very low, 31.6 % of the low risk, 48.1 % of the medium risk, and 73.3 % of the high/very high-risk offenders recidivated nonviolently. It means that the young offenders from the high/very high-risk category reoffended 7.0 times more in nonviolent manner than did their very low risk equivalents. In essence, this validates the LSI-OR classification system's predictive capability (Howell et al., 1995) for nonviolent recidivism of the total sample of young offenders, even though paired comparisons of recidivism percentage across six pairs of risk levels produced differential results. Reminiscent of the general recidivism, there were no significant differences between the very low and low, and the low and medium LSI-OR risk groups for the nonviolent reoffending.

A robust relationship between the LSI-OR instrument and nonviolent recidivism is additionally confirmed by the ROC AUC of .75 for the LSI-OR Section A's total score, an effect very much in line with the current youth risk prediction literature (Catchpole & Gretton, 2003). Survival analyses provide further validation for the significant effect between the LSI-OR Scale and general recidivism by providing evidence that the LSI-OR higher risk level is associated with a lower survival probability (*Log Rank*), although differentiation between survival rates associated with specific risk levels is less unequivocal. The specific paired comparisons show (in two separate ways) that the high/very high-risk group is successfully differentiated from all other risk groups, whereas some other risk groups, especially the very low and low and the low and moderate risk groups, are not different from each other on their respective survival rates.

Regarding violent reoffending, there is robust evidence that, across the four risk levels, the proportion of violent recidivists to nonrecidivists is significantly different, augmented with an increase of LSI-OR risk level, as originally hypothesized. Using the LSI-OR Scale, none of the 19 youths identified as very low risk violently reoffended in the 3.8-year follow-up. In comparison, 13.2 % (5 of 38) of the youth identified as the low risk, 19.2 % (10 out of 52) identified as medium risk, and 35.6 % (16 of 45) identified as high/very high risk violently reoffended in the 3-8 year follow-up.

It means that, although there is a low baserate (20.1 %) of violence in the current sample of 154 of male youth offenders, there is a quite strong (significant), positive linear relationship between the four LSI-OR risk levels and violent recidivism. In general, it is found that the LSI-OR Scale is significantly related to violent recidivism, with ROC AUCs of .72 and .71 for the LSI-OR Sections A and B and general recidivism. Such AUCs are very comparable to those of Catchpole and Gretton (2003) for the two risk measures they recently validated on young offenders of British Columbia (the SAVRY and the YLS/CMI) and for the PCL: YV (psychopathy construct), all with ROC AUCs of .73 (Appendix A). Survival analyses provide further validation for the significant effect between the LSI-OR Scale and violent recidivism. They generate evidence (*Log Rank*) that the LSI-OR higher risk level is associated with a lower survival probability, although differentiation between risk levels is somewhat less definite for violent recidivism than it is for nonviolent recidivism, since all the adjacent risk groups do not differ. In spite of this, the very low LSI-OR group is significantly different from both the medium group, and the high/very high group and the low LSI-OR group is significantly different from the high/very high group.

These results should be interpreted with caution due to low number of violent offenders across the LSI-OR four risk levels ($N = 31$ in total). If these findings reflect an existing effect, then they indicate that there might be an excess of risk levels for prediction of violence in young offenders. An additional study should clarify whether, in fact, it is beneficial to utilize five levels of risk as compared to three or, possibly, four risk levels, much like what is used by the YLS/CMI instrument (Hoge & Andrews, 2002). However, the current sample of violent offenders is low and such results need to be crossvalidated on another, larger, sample of young offenders.

In summary, for the total sample of 154 male young offenders, it is evident that the LSI-OR Scale successfully discriminates between the four groups of offenders who exhibit widely different recidivism rates, whether they are general, nonviolent or violent young offenders. However, there is some overlap between the recidivism rates and survival patterns/times between the very low and low risk groups, and the low and medium risk groups, for the general and nonviolent recidivism. As for violent recidivism, the differences between specific risk levels are even less impressive because no 2 adjacent groups do significantly differ, including the medium and high/very high-risk groups, which demonstrate a stable pattern of differentiation from all other risk groups for the general and nonviolent recidivism. Further investigation of this problem is recommended.

In making comparisons between the custody and community offenders, although the positive linear relationship between the risk level and recidivism rates had been predicted for both the custody and community participants, it was disconfirmed for the former group and fully confirmed for the latter group. Essentially, the four-level LSI-OR risk system performed ineffectively for the custody participants, as it did not distinguish between the proportions of

recidivists to nonrecidivists across the risk levels (very low, low, medium, and high/very high) and there were no increases in young offender recidivism rates nor decreases in their survival rates/time in conjunction with the increasing risks observed. A small sample size ($n = 57$) of the custody participants may have been responsible for lack of statistical power to produce the existing effects. A relationship between risk levels and recidivism rates should be re-assessed on a larger sample of young offenders who were assigned to the institutions.

Interestingly, and as would be expected, there were no cases of custody offenders in the very low LSI-OR risk category, such that the three-level LSI-OR risk system was utilized in the evaluation of the recidivism and survival rates for this group. As many as 4 youths of the 5 (80.0 %) defined as low risk on the LSI-OR reoffended in the 3.8-year follow-up, while only 12 out of 21 (57.1 %) identified as medium risk, and 26 out of 31 (83.9 %) classified as high and very high risk on the LSI-OR Scale reoffended in the 3.8-year follow-up period. Significant ROC AUCs of .72 and .73 were found, however, confirming that the LSI-OR Static factor's relationship with general and nonviolent reoffending of the youths in custody is in the moderately high range and disconfirming that a relationship exists with violent recidivism. Also, ROC AUCs do not identify an existing relationship between the LSI-OR Dynamic factor and the violent or nonviolent recidivism of youth in custody. This is inconsistent with modern literature that suggests reciprocal relationship between antisocial behaviour and parenting (Stern & Smith, 1999), between various family factors, such as disciplinary practices and family structure, peer influences, neighborhood factors and delinquency (Loeber & Hay, 1997), and schooling experience/success rate (graduation) and the incarceration of youth (Winters, 1997), just to name a few.

These important dynamic correlates of juvenile offending need to be captured within the context of the fact that, developmentally, adolescence is a time of change and maturation. The influence of dynamic factors related to development (such as responsibility and social perspective taking) is not well understood but “youth risk assessment should take into account the developing nature of adolescent functioning and corresponding changes that relate to risk.” (Catchpole & Gretton, 2003, pp. 703-704).

The fact that the LSI-OR Scale does not identify a relationship between dynamic LSI-OR components and the juvenile reoffending of custody youth is unfortunate, since this instrument was initially designed to capture dynamic needs of offenders, in addition to historic factors. Both are important in prediction of recidivism of youth and as such, some of the LSI-OR items may need to be fine tuned to extract the essence of their needs related to developmental, familial, and various environmental factors.

Regarding the LSI-OR instrument’s ability to predict recidivism of youths sentenced to the community (probation) term, the four-level LSI-OR risk system (i.e., the very low, low, medium, and high/very high) was utilized in the evaluation of the recidivism rates, and in completing other predictive analyses with this group of young offenders. As many as 2 youths of the 19 (10.5 %) defined as very low risk on the LSI-OR reoffended in the 3.8-year follow-up, while 9 out of 33 (27.3 %) identified as low risk, 15 out of 31 (48.4 %) classified as medium risk, and 10 out of 14 (71.4 %) classified as high and very high risk on the LSI-OR Scale reoffended in the 3.8-year follow-up. There is a significant increase in the percentage of youths who reoffended associated with the increased LSI-OR risk level. This provides evidence for the instrument’s ability to differentiate risk for general recidivism in a sample of youth offenders.

As for violent recidivism of youths on probation (community offenders), the current study provides evidence for the ability of the LSI-OR instrument to differentiate risk for violent recidivism. None of the 19 youths (0.0 %) defined as the very low risk on the LSI-OR instrument violently reoffended in the 3.8-year follow-up period, while 4 out of the 33 (12.1 %) identified as the low risk, 6 out of the 31 (19.4 %) classified as the medium risk, and 5 out of the 14 (35.7 %) youths categorized as the high and very high risk violently reoffended in the 3.8-year follow-up.

Significant ROC AUCs of .77 and .72 between the LSI-OR total score and general and nonviolent recidivism confirm the instrument's high and moderately high diagnostic power to predict general and nonviolent reoffending of the community youths. ROC AUC of .76 between the LSI-OR total score and violent recidivism identifies an existing robust relationship between the instrument and violent recidivism of young offenders in the community, outperforming the AUCs of .73 for the three risk/needs instruments recently validated for the violent recidivism of institutionalized violent youth by Catchpole and Gretton (2003). There is support for a strong relationship between the dynamic and static content of the LSI-OR instrument and the general, violent, and nonviolent offending of youth, reflected in the ROC AUCs ranging from .65 to .75 (higher effects for the dynamic than static content). These results validate the use of the LSI-OR risk/need instrument as a broad-based risk assessment system, incorporating a broad range of variables predictive of youthful criminal activity, both dynamic and static in nature.

These findings are in accord with current literature in the field, indicating that there are two groups of risk assessment instruments for young offenders, one based largely on offence history variables and the other represented as need assessment systems (Hoge, 1999). The current research provides evidence that, for the group of community youth, The Level of Service Inventory-Ontario Revision (LSI-OR) is a valid tool, which draws on both dynamic and static

needs of offenders. It provides information about criminogenic (major and minor) needs and other (traditionally thought to be noncriminogenic) variables, which are linked here to youthful reoffending in the current sample of Caucasian male youths. Above and beyond the influence of the Big Four major predictors of recidivism (linearly combined), the following need areas added to the prediction of future youthful offending: education and employment-related content (minor criminogenic), information about leisure and recreation patterns (minor criminogenic) and, surprisingly, treatment responsivity considerations (a noncriminogenic broad concept that incorporates motivation and amenability to treatment) (Serin, 1997; Serin, 1998). “Information about criminogenic needs and responsivity are particularly important in systems with a child welfare or rehabilitation focus (Hoge, 1999)” and may be critical to effective decisions about treatment strategies and targets (Andrews & Bonta, 1998; Hoge, 1999).

Override function. The override function, which entails the use of professional discretion to modify the assessment of actuarially derived risk, was not successful in the current study. The LSI-OR classification system’s association with the various measures of recidivism actually deteriorated when the override was used. The initial risk correlated .45 with general recidivism, .28 with violent recidivism, and .41 with nonviolent recidivism, whereas the final risk correlated .39 with general, .23 with violent, and .37 with nonviolent recidivism. The initial risk’s higher predictive or diagnostic efficiency was confirmed by the receiver operating characteristic (ROC) method, with the initial risk having the ROC AUC value of .75, as compared with the final risk’s ROC AUC value of .72, when predicting general recidivism. Thus, the initial risk, derived from collapsing Section A score into a simple 4 level risk variable, portrays a somewhat stronger relationship between the LSI-OR instrument and recidivism of young offenders than does the final risk, demonstrating limitations of the subjective professional judgment, since it did not

improve the actuarial prediction. This finding is, for the most part, consistent across the two subgroups of offenders when they are divided by location. Therefore, the initial risk was chosen over the final risk's classification scheme for analyses in the current study.

The concern here is not with the frequency with which the override function was utilized on the current sample of youths, but rather with the poor quality of the clinical decisions that were made, lowering the instruments' association with the criterion variable (recidivism). The frequency (13.6 %) and the pattern of override utilization (90.5 % of the overrides were moved upward) were within the accepted limits, since "a rule of thumb suggests that no more than 15 % of all classification decisions should be the result of overrides" (Wiebush et al., 1995, p.203) and that it is a common practice across the province for the overrides to be more frequently used up than down (Wormith & Sheppard, 2003).

However, intercorrelations between the first and second LSI-OR assessments (i.e., initial and final risk intercorrelations for the short- and long-intertest intervals) are an indication that the override may be used to bring the risk level more in line with the first assessment's risk level. It would be worthy of pursuing by the Agency (MCS) whether a second assessor should or should not remain blind to the first assessment's results and, whether or not, an Agency's protocol is being followed regarding 'administrative' and discretionary override use (i.e., override downward was not utilized in the community sample in the current study). Wiebush, Baird, Krisberg, & Onok (1995) promote an idea that discretionary overrides are critical to the success of classification systems as they allow decisions to be influenced by important case factors that may not be captured in the risk or need assessment tools. In this way, discretionary overrides provide staff with the opportunity for input into formal decision-making and in so doing strengthen it. However, such overrides have to be carefully monitored because, staff may simply

return to using subjective judgments, as might be the case here, when the final risk's correlation with recidivism is lower than the initial risk's correlation.

Use of Strengths. The use of the Strengths variable deserves its own commentary, because there is evidence that the strengths of young offenders may not be captured by the type of interview format that professionals use in order to rate the LSI-OR instrument. In light of the current findings, there is a concern that protective factors, which counter risk factors and provide buffers against them by promoting positive behavior (Krisberg, Currie, Onek, & Wiebush, 1995), may not be captured in older young offenders through the LSI-OR interview process.

Hoge, Andrews and Leshied (1996) suggest that if researchers use an extended scope of risk factors and do not neglect protective factors, it can improve our understanding of why some individuals become delinquent and others do not, and how such factors affect the various aspects of delinquency processes: onset, escalation, de-escalation, and desistance (Loeber & Stouthamer-Loeber, 1996). This is important because the specific school, family, and peer-related protective factors were identified (by the Rochester project) as being present in the high-risk resilient youth, who did not succumb to the risk and actually did not engage in delinquency or violence (Thornberry, Huizinga, & Loeber, 1995). Each of these protective factors taken separately, although significant, had a relatively small impact on resilience and yet, all of them taken together, reduced delinquency of high-risk youth (Thornberry, Huizinga, & Loeber, 1995).

Therefore, a thorough assessment of protective factors is necessary and treatment programs should implement this finding about the cumulative effect of different protective factors in the areas of education, family, and peers, by exposing these youths to as many protective factors as feasible.

In the current study, the Strengths variable did not correlate with any measure of recidivism for older male youths. Again, the LSI-OR manual and the training, which the agency (MCS) provides for the professionals who administer the LSI-OR instrument, are vague and nonspecific on its use of Strengths. The agency should pursue the use of Strengths through further research. The importance of this type of information should not be underestimated and it may be beneficial to include strengths 'formally' in the calculation of risk in a quantitative manner so that it can be used in a consistent and reliable fashion with all young offenders. The Ministry needs to devote more attention to this in training.

Review of Seven Hypotheses of the Study

First hypothesis. The first hypothesis concerned the LSI-OR's overall reliability and predictive validity. Specifically, it was predicted that young offenders classified as high and very high-risk offenders would re-offend at a significantly higher rate (four of five times higher) than offenders from low or very low risk categories. The hypothesis also predicted a positive linear relationship between risk levels and recidivism, with an r of .40 for general recidivism.

The current study confirmed the LSI-OR's reliability and predictive validity on a sample of Caucasian, male young offenders from northern Ontario, to the degree specified above.

Reliability of the LSI-OR was assessed in two ways. The internal consistency of Section A of the LSI-OR was determined using Cronbach's alpha. The coefficient was high ($\alpha = .89$) and comparable to that of another psychometric investigation ($\alpha = .91$) on a small sample ($n = 31$) of older young offenders (Girard, 1999).

The database that was developed for the current study came from existing and available young offender files. It did not permit an investigation of inter-rater reliability in the traditional psychometric sense because the agency was not in the habit of doing (inter-rater) reliability

checks on its LSI-OR's. Moreover, test-retest reliability of the LSI-OR has not been commonly considered useful because of the dynamic quality of many of the scale's items, with some items susceptible, purposefully, to change in a short period of time. However, the file review process did reveal a small number ($n = 57$) of cases that had been re-assessed, on average, 316 days after the first assessment, all of which were completed by another caseworker. However, there was no guarantee that they were completed in a 'blind' fashion. To the contrary, staff would have been encouraged to review the findings of any previous assessments on file. Consequently, a comparison of these pairs of assessments represents what we have called a 'hybrid' inter-rater, test-retest estimate of reliability.

A robust correlation between the two LSI-OR total scores was obtained ($r = .63$). Interestingly, however, when the sample was divided into re-assessments within one-year period ($n = 37$) and between one and two years ($n = 20$), the correlation for the former (.75) was considerably higher than that for the latter year (.53).

Thus, inter-rater consistency and temporal stability reliabilities are confounded in this study and the present 'hybrid' reliability results are less definitive than traditionally derived temporal and interrater reliability estimates. Nevertheless, they do demonstrate the point of truly decreasing interrater reliabilities over time (i.e., short- vs. long- intertest intervals). Interrater reliabilities for those offenders who were re-assessed within the short period of time are considerably greater than those obtained for the individuals re-assessed after a long period of time which reflects the dynamic nature of the LSI-OR, which the authors have insisted is a positive feature of offender risk/need assessment (Andrews & Bonta, 2003, Cottle, Lee, Heilbrun, 2001). Although the overall temporal stability of the instrument is low, this should not

necessarily be considered a psychometric problem, particularly since a decrement of reliability was found from the first- to the second-year, inter-test interval.

Nonetheless, any instrument that requires judgment by the assessor should be routinely determined, particularly by large agencies such as MCS, which require the routine administration of the instrument with its clientele. It should be re-assessed on a larger sample of youth who would be immediately assessed by a second rater.

It is quite likely that the instrument's sensitivity to true changes that take place in young offenders over time is measured by the instrument's dynamic items. Therefore, in the future, it would also be beneficial to assess the dynamic validity of the LSI-OR instrument in order to evaluate how the instrument is capturing a change in dynamic needs of youths and how such a change impacts on their reoffending.

It is interesting to note that Section A, Section B, and Initial and Final risk levels demonstrate the lower reliability pattern with the longer retest interval, while Strengths do not demonstrate this pattern. This is not surprising in view of the Strengths' weak performance in the current study. Although it is conceivable that the strengths of young offenders could be relatively stable characteristics of developing personality ('buffers') (Krisberg, Curie, Onek, & Wiebush, 1995), it is also possible that they are not well captured by the LSI-OR in the current study.

The current study considered two forms of validity, construct/structural validity and predictive validity. Factor analysis demonstrated the existence and importance of static and dynamic factors, the latter being especially critical to the assessment of risk/needs of youth on probation. This was accomplished by uncovering the higher-order (latent) Section A's structure, Static Factor and Dynamic Factor. These 2 factors represent that which has been theorized by the authors of the social learning perspective of criminal conduct (Andrews & Bonta, 1998), and it is

congruent with the current literature (Gendreau, Little, Goggin, 1996; Cottle, Lee, Heilbrun, 2001). These two factors, which underlie the instrument's sections, subsections and items, are highly associated with the recidivism of youth, as represented by the key recidivism variables.

The demarcation of both static and dynamic risk factors for the population of juveniles would be beneficial, as it may enhance a priori classification of risk (static factors), and the targeting of dynamic areas for risk-reducing intervention planning with the help of dynamic factors (Cottle, Lee, & Heilbrun, 2001). On the other hand, the current study provides evidence for the existence of an overlap ($r = .32$) between static and dynamic dimensions of criminogenic needs of young offenders, such as in domains of substance abuse and criminal acquaintances. Relatively high factor loadings of these (single or aggregate) items on both Static and Dynamic LSI-OR Factors demonstrate that static and dynamic needs of young offenders are interconnected and, likely, not quite separable.

Finally, the findings of the current study confirm the LSI-OR instrument's predictive validity for the cohort of young offenders. Based on the extensive analyses of the instrument's predictive abilities, through the use of correlational analyses, receiver operating characteristic (ROC) method, survival analyses, as well as complex multiple regression models, it has been ascertained that the instrument is capable of evaluating the probability of future criminal behavior (violent and nonviolent recidivism) in male young offenders.

The four-level classification scheme was utilized and the high and very high-risk groups of offenders recidivated at the rate much higher than the low risk offenders, exceeding the hypothesized differential classification power of these risk levels, as recommended for "well-designed" risk assessment instruments (Wiebush et al., 1995, p.177). In fact, the LSI-OR fourth and highest level of risk captured 7.6 times more recidivists than the very low risk level for

general recidivism and 7 times more than the very low risk for nonviolent recidivism. As for violent recidivism, the high/very high-risk group's recidivism rate of 35.6 % can be contrasted with the low risk group's rate of 13.2% and the very low risk group's rate of 0.0 %, also conforming the differential recidivism rates alongside risk levels, in the right direction.

In summary, when the high and very high-risk levels were combined into one, the four-level classification scheme was successful in classifying young offenders into significantly different recidivism categories, indicative of a positive linear relationship between the LSI-OR risk levels and recidivism rates of Caucasian, male young offenders from northern Ontario.

Survival analyses provided clear support for the four-level classification scheme as well. The differences in the rates (time) of survival by risk level emerged especially clearly for the high and very high-risk group, which demonstrated significantly lower survival rate from all other risk groups. Although the remaining risk groups are somewhat less clearly differentiated on their survival rates/time, the overall findings indicate that as the length of follow-up increases so does the cumulative rate of re-offence. Interestingly, changes in the survival rates after 2.5 years were minimal, suggesting that the greatest time of risk for re-offending across all risk levels is during the first and second post-release years.

Further support for the validity of the LSI-OR risk classification system comes from the findings of ROC analyses. They indicate moderate to large-sized effects between the LSI-OR four-level risk scheme and the binary outcome variables, general (AUC= .75), nonviolent (AUC = .73), and violent (AUC = .69) recidivism. These effects are somewhat lower than ROC AUCs for the Section A's total score with the (binary) recidivism variables (.77, .75, and .72, respectively). The LSI-OR's predictive power for violent recidivism declines from being in a moderately high range (AUC >.70) when Section A's total score is tested for its predictive power

on violent recidivism, to being in the moderate range ($AUC < .70$), when its ordinal version (initial risk) is tested by ROC analyses. The risk level variable is an ordinal scale (4 risk levels), ordering offenders along a continuum of the LSI-OR total scores. It is not surprising that it may lose some of its predictive association with recidivism, in comparison to the original continuous variable's predictive power. In general, the range of ROC AUCs for single LSI-OR predictors (variables) of general recidivism in this study (.506 to .766) are similar to those found in other recidivist studies (Kroner & Mills, 2001; Catchpole & Gretton, 2003), but may be somewhat lower for violent recidivism, especially in comparison to the tools specifically designed to predict violence (e.g., HCR-20, adults version, AUCs averaged in the area of .78, up to .80; Douglas & Webster, 1999).

Importantly, using ROC analyses increases generalizability of the results (Kroner & Mills, 2001). Kroner and Mills (2001) assert that the relative invariance of predictive accuracy of ROCs has implications for how widely the results can be applied. Based on the empirical evidence from Rice and Harris (1995) that ROCs are relatively independent of base rates, it can be suggested that with similar outcome measures and samples, changing the base rates will not substantially change the relative predictive accuracy of the instruments (Kroner & Mills, 2001).

Finally, multiple regression-based predictor and outcome analyses yielded a very robust validity for the LSI-OR instrument, in the prediction of all three types of binary recidivism and for the number of charges continuous outcome variable. Multiple regression analyses revealed that the LSI-OR instrument is a valid and important risk/need assessment tool for older young offenders, since its sections showed incremental predictive validity when the 'location' (custody-community) control variable was controlled for. ROC analyses applied to multiple regression-based final 5 Section model indicate that these (linearly combined) variables in the model have a

high diagnostic accuracy ($AUC = .80$) in prediction of (binary) general recidivism and moderately high diagnostic accuracy ($AUC = .74$) in prediction of (binary) violent recidivism, for older young offenders. These results indicate that, in attempting to predict recidivism, the investigation of classes of variables and their combinations rather than individual measures, can provide a more meaningful and effective prediction of recidivism, including violent recidivism (Duncan, Kennedy, & Patrick, 1995).

This means that the Level of Service Inventory-Ontario Revision (LSI-OR) instrument is intrinsically well equipped to predict both nonviolent and violent recidivism in young male offenders.

Second hypothesis. The second hypothesis was concerned with the prediction of a significant difference between the custody and community groups of young offenders on their LSI-OR scores and on their recidivism rates. It predicted that the custody young offenders would have significantly higher LSI-OR scores and higher recidivism rates than community young offenders.

Although the initial difference between the custody and community young offenders was traced to the number of nonviolent offences only, and the youth from custody did not demonstrate more severe or violent index offending, they were still rated significantly higher on many of the LSI-OR variables, subsequently obtaining a significantly higher LSI-OR total score (19.7 vs. 11.4), and recidivating at a significantly higher rate than their community counterparts (73.7% vs. 37.1 % for general recidivism) during the 3.8-year follow-up time. For violent recidivism, the differences between the custody and community groups were less evident, and were confined to the number of violent charges, much higher for the custody than community offenders ($M = .84$ and $.38$), but there were no significant differences between the percentages of

their violent offenders. These findings for violent recidivism should be interpreted with caution, since there were only 31 violent offenders in the current study and greater numbers of young offenders will be required to cross-validate these results.

The finding that the community and custody offenders significantly differed on their LSI-OR total score suggests that the instrument was capable of reflecting the essential differences between clients, based on the eight variables (scales and subscales) that differentiated between these two (custody and community) groups. The LSI-OR instrument did not demonstrate significant differences between the custody and community participants on seven LSI-OR variables, suggesting that the custody and community young offenders had similar levels of education, family/marital problems, leisure/recreation patterns, and companions-related issues. Also, these offenders did not differ on two LSI-OR Sections, F and G, confirming that they were known for having a similar degree of mental health/suicidal problems and motivational (treatment amenability) difficulties.

The findings of the current study also suggest that, at least in this geographic catchment's area, youth courts are sentencing violent offenders to both institutions and community, but the former appear to be higher risk and have more criminogenic needs than the latter.

Regarding their recidivism rates, the custody and community young offenders were found to be significantly different. The custody offenders' recidivism occurred at a much higher rate during the 3.8-year follow-up period. In fact, the odds of recidivating rather than not recidivating were 4.7 times higher for a young offender sentenced to custody than for the offender placed in the community. Based on location alone (custody or community), the odds of violently recidivating were 2.13 times higher for the custody rather than community offender.

Community young offenders fully benefited from the LSI-OR four-level classification scheme, demonstrating a positive linear relationship between their risk level and recidivism rates, and showing a different proportion of recidivists to nonrecidivists, across the four risk levels, for general, violent and nonviolent recidivism.

However, although the LSI-OR instrument, in general, successfully identified the custody offenders as being at higher risk for recidivism than community offenders, it did not demonstrate adequate capacity to predict their recidivism rates differentially and incrementally across the four risk levels. In fact, at the low risk level, custody youth recidivated at a higher rate than at the medium risk level, which illustrates the LSI-OR instrument's inability to predict risk levels and recidivism rates for the Caucasian, male young offenders, who were sentenced to custody.

No satisfactory explanation can be offered regarding the LSI-OR instrument's inadequate performance with the custody group. Possibly, the reduced number of custody offenders ($N = 53$) did not allow the capturing of some (small) effects. The pattern of results indicates, however, that there were some highly significant effects between the Static LSI-OR factor and general, as well as nonviolent recidivism ($AUCs = .72$ and $.73$). It is concluded that the LSI-OR instrument was unable to capture the dynamic component of risk/needs of youth in custody ($AUCs$ of $.53$ to $.59$ for Dynamic LSI-OR factor and binary recidivism indicated only slightly higher than a chance performance). This could have been detrimental to the instrument's ability to predict violent re-offending of youth in custody. Many explanations are possible and could be attempted, including one that relates to the manner in which young offenders are assessed while in institutions, as opposed to them being assessed in the community. Further evaluation of the risk assessment methods for the custody and community young offenders is in order. Finally, it might be possible

that the LSI-OR instrument is not sensitive to the dynamic needs of custody offenders and would have to be enhanced in this regard.

Third hypothesis. This hypothesis specified that Section A (the four major and four minor risk factors) and Section B (specific risk/need factors) would perform better than section C (institutional factors due to prison experience), Section F (other client issues) and Section G (responsivity considerations) in prediction of young offenders' recidivism.

The role of Section A has been consistently central and evident across the various analyses on the total sample and for the young offenders in the community. ROC analyses indicated large-sized effects between Section A and the (binary) general and nonviolent recidivism variables, as well as a moderate-sized effect with violent recidivism. Regarding Section B's performance, ROC AUCs indicated moderate-sized effects with all three binary outcome variables, while performing highly accurately in the prediction of violent binary recidivism ($AUC = .74$) for youths in the community.

As for the other LSI-OR Sections (C, F, and G), the ROC AUCs indicated their differential performance across the three types of (binary) recidivism variables and for the two subgroups of offenders. Specifically, Section C showed the lack of significant diagnostic accuracy for all youth and for the youth in custody, thus performing inadequately in the current study in relation to recidivism prediction, both violent and nonviolent. Section F showed significant, but very weak (only slightly above chance) predictive capacity for general recidivism, and was not diagnostically effective when recidivism was divided into the violent and nonviolent kinds, which was not unexpected. Current research indicates that mental health disorders are poor predictors of recidivism in general, including violence (Harris & Rice, 1997).

However, the outstanding performance of Section G in prediction of all three types of recidivism, especially for the community group, was unexpected. It was surprising that Section G was stronger in terms of its ability to predict violence for community youths than was Section B, ROC AUCs = .75 and .74. Also, in multiple regression models, Section G outperformed Section B since it uniquely contributed to the prediction of youthful (general and nonviolent) re-offending, after Location and Section A were controlled for. Section B did not make unique contribution to the models of recidivism in young male offenders, in spite of its high association with violent recidivism. Presumably, this might be, because the Section B relation with recidivism is based on common variance with Section A and its relation with recidivism, whereas the Section G relation with recidivism is not already captured in the Section A relation with recidivism. This question remains open to further inquiry.

From the above, it is concluded that a thorough evaluation of the young offender responsivity factors, especially those related to motivation and use of minimization and denial, are required, since they constitute risk factors for recidivism in the current study. These are motivational factors and minimization/denial, which emerged as the responsivity characteristics of youths that are criminogenic in nature. These two items discriminated between recidivists and nonrecidivists in the current study. The responsivity attributes of offenders, whether or not they are being risk factors, are detrimental to the achievement of treatment goals due to common difficulties with treatment readiness and performance (Bonta, 1995; Bonta, 1999; Serin, 1998; Serin & Kennedy, 1997).

Two logistic multiple regression models of the current study yielded significant predictive capacity for the Location, Section A, and Responsivity concerns (Section G) toward

the (binary) general and nonviolent recidivism. Also, as a sole LSI-OR predictor, Section G showed a high association with violence in the community offenders.

Overall, Section G's performance in the current study was unexpectedly strong, and its effects with recidivism exceeded those of Section B, for Caucasian, male youths. Therefore, although interesting and revealing of a close connection between the risk, need and responsivity principles of young offender rehabilitation (Andrews & Bonta, 1998), the current findings were not expected and disconfirm the third hypothesis.

Fourth hypothesis. The fourth hypothesis specified the important role of Section B and Strengths in predicting juvenile recidivism, especially their violent re-offending. This hypothesis stems from how the instrument is designed to be scored (Andrews, Bonta, & Wormith, 1995), where Section B and Strengths are expected to produce additional information to Section A, for the enhancement of recidivism prediction.

There is no evidence of a unique predictive role of Section B when it is used in multiple regression models in the current study, with Caucasian male young offenders. When it is used as a sole predictor, Section B is highly associated with violent recidivism of community offenders and it has a moderately high diagnostic predictive power for the general and nonviolent recidivism of all young offenders. However, its association with recidivism appears to be redundant to that of Section A, when multiple regression models are tested. This does not extend the previous contention of other research (Girard, 1999), that Section B's content is linked to the violent offending of adult male offenders onto the population of young male offenders.

It would be unnecessary to discuss the weak role of Strengths at length, because it is clear from the previous detailed analyses and commentaries, that the Strengths variable was not even significantly associated with the key recidivism variables of the current study. The Agency

(MCS) should pursue the use of strengths through further research and by enhancing the LSI-OR Manual in this regard and, also, by providing additional training for the MCS staff. On the whole, the findings of the current study disconfirm the fourth hypothesis.

Fifth hypothesis. This hypothesis specified the incremental predictive validity of Sections B, C, F, and G, for the prediction of recidivism in young offenders, above and beyond the Location and General risk/needs factor's contributions.

A sequence of blockwise logistic regressions were utilized, with the Location (custody-community) and the General risk/needs (Section A) variables entered first. As a result, all other LSI-OR Sections (B, C, F, and G), which entered last, had been tested for their unique contribution to the model. Only Section G showed incremental predictive validity in prediction of general and nonviolent recidivism. As for violent recidivism, only Section A demonstrated unique power to predict recidivism, whereas Location and all other LSI-OR Sections became redundant to Section A. The latter finding is concordant with the current literature that the factors which are most highly and consistently related to risk of violent behaviour are historical, including age, sex, past antisocial and violent conduct, psychopathy, and aggressive childhood behaviour (Harris & Rice, 1997).

In summary, Section G emerged together with Section A in analyses with two binary measures of recidivism, suggesting that it may contain some unique criminogenic content amongst its items. These are, however, preliminary findings and will require cross validation on another young offender sample, especially since Section G did not emerge as a significant contributor to the prediction of recidivism for another recidivism variable, Number of charges. These findings confirm the fifth hypothesis, showing that other LSI-OR Sections add

incremental predictive validity to the prediction of general and nonviolent recidivism in young offenders.

Sixth hypothesis. The sixth hypothesis spoke to the point of the most significant correlates of recidivism in young offenders, the “Big Four,” plus an additional minor set of four risk factors (Andrews & Bonta, 1998; Simourd & Andrews, 1994; Cottle, Lee, & Heilbrun, 2001), all of which are sampled in the General risk/need factors section of the LSI-OR. It was hypothesized that major risk factors are the strongest correlates of recidivism. The correlational results had indicated that all of the eight (major and minor) risk variables were related significantly to the outcome indices: total number of (any) charges and total number of nonviolent charges. As for violent charges, four major factors and one minor factor (i.e., education/employment) were related significantly to the outcome variable.

Using the number of charges as a (continuous) outcome variable, blockwise and stepwise multiple regression selection methods were applied to establish whether the Criminal history, Companions, Procriminal attitudes, and Antisocial pattern (a block of four major predictors) made significant contributions to the model, controlling for location (custody-community). Subsequently, the four complimentary (minor) predictors were tested on whether or not any of them demonstrated incremental predictive validity, controlling for all other variables in the model.

The final model of total charges and nonviolent charges for the entire sample of (Caucasian male) northern young offenders reveals that two variables (1 major and 1 minor risk factor) – Criminal history and Leisure/recreation--uniquely contributed to the model, controlling for the effects of Location and 4 major predictors.

The final model of violent charges for the entire sample of (Caucasian male) northern young offenders reveals that two variables (1 major and 1 minor risk factor) – Criminal history and Education/employment – uniquely contributed to the model, controlling for the effects of Location and 4 major predictors, which had been entered first. It will be important to consider the National Youth Study's (2001) suggestion that "violence is relatively widespread among adolescents and few studies have been undertaken to examine the co-occurrence of serious violence with other problems." (U. S. Department of Health and Human Services, 2001, p. 50). The developmental dynamics of youth violence have not been clearly established in the literature and the current study adds to the existing knowledge by identifying the following items as the ones that differentiated between the violent recidivists and nonrecidivists: education below grade 12, history of suspensions and being expelled from school, as well as problems with participation and performance.

Overall, in the eight-subsection model of total and nonviolent charges, offender location (custody-community), as well as three out of the four major predictors, Companions, Procriminal attitudes and Antisocial patterns, failed to emerge as significant predictors. As well, except for Leisure and recreation patterns of young offenders, other minor risk variables did not enter the equation. In the eight-subsection model of violent charges, offender location (custody-community), as well as three out of the four major predictors, Companions, Procriminal attitudes and Antisocial patterns, failed to emerge as significant predictors. Except for Education and employment related difficulties, other minor risk variables also did not enter the equation.

Since a mathematically driven exclusion of variables from the models was exercised in the last step, caution should be practiced in interpreting or generalizing these results to other populations of young offenders.

The above pattern of results is in accord with the current literature, indicating that broadly construed criminal history factors, combined with problems related to educational achievement (poor grades), inability to relate to authority figures and school dropout, as well as ineffective use of leisure time, are strong risk factors for delinquent youth (Simourd & Andrews, 1994; Cottle, Lee, & Heilbrun, 2001), uniquely related to the number of charges outcome indice.

In summary, these findings do not confirm the sixth hypothesis in regards to what the best predictors of recidivism in young offenders were expected to be. Only one of the four major risk factors (Criminal history) emerged as a strong predictor of the number of charges for male young offenders from northern Ontario, compared to two minor risk factors, such as Leisure/recreation (nonviolent charges) and Education/employment (violent charges).

Seventh hypothesis. This seventh and last hypothesis of the current study stated that the risk level endorsed following the use of an override would improve prediction of recidivism as compared to the initial risk level. The results of the current study did not confirm the use of the professional discretion principle in overriding the actuarial-derived risk level, as it was generally not successful at improving the risk level's association with the recidivism measures. These correlations were already presented under the Other LSI-OR variables and recidivism in the discussion section. The LSI-OR classification system's association with the various measures of recidivism actually deteriorated after the override was used. The initial risk's higher predictive or diagnostic efficiency was confirmed by the receiver operating characteristic (ROC) method, with the initial risk having the AUC value of .75, as compared with the final risk's AUC value of .72, when predicting general recidivism. Thus, the initial risk, derived from collapsing Section A score into a simple 4 level risk variable, portrays a somewhat stronger relationship between the LSI-OR instrument and recidivism of young offenders than does the final risk, demonstrating

limitations of the subjective professional judgment, since it did not improve the actuarial prediction. This finding appears to be consistent across the two subgroups of offenders, when they are divided by location. It confirms previous reports that, in some cases, clinical prediction does not add to the mechanical (actuarially-based) prediction (Wormith & Golstone, 1984) and that “mechanical prediction is typically as accurate or more accurate than clinical prediction” (Grove et. al., 2000).

Limitations of the Research and Direction for Future Research.

The current study addressed issues of reliability and validity of the recidivism prediction strategy, as per the Level of Service Inventory-Ontario Revision instrument (LSI-OR; Andrews, Bonta, & Wormith, 1995). The sample, although representative of the provincial older young offender population of Caucasian males, should not be construed as being representative of northern young offenders in general, or all young offenders across the province.

The northern region of Ontario is unique in its correctional population make up, in which aboriginal Canadians are over represented (Wortley, 1999), demonstrating higher recidivism risk and recidivism rates (Bonta et. al., 1997; Jung & Rawana, 1999; Worthly, 1999). Aboriginal youths were not included in the current study and there should be an attempt to validate the LSI-OR instrument separately on a sample of aboriginal youth.

Although literature has been variable in this regard, some have found that females tend to be at an overall lower risk than males (Coulson et.al. 1996). Again, females were not a part of this study, and the current findings may not be directly applicable to them, even though Jung and Rawana (1999) found that male and female delinquents did not differ on their total risk/need score and the eight-risk/need factors of the MRNAF actuarial risk/need instrument. Caution is recommended when generalizing these results to aboriginal and female young offender

populations. Also, a lack of representation of black people in the current study, in contrast to their being over represented in southern Ontario corrections (Worthley, 1999), supports the notion that application of recidivism prediction models from the current study to the southern Ontario jurisdiction might be of risk.

Even though many of the study findings for the total young offender sample of Caucasian males, as well as for the community subsample were as expected, the results for the custody offenders are insufficient to claim a full support for the use of the LSI-OR instrument with this group. There is no reservation about the instrument's ability to capture the custody youths' risk factors for later recidivism, since their LSI-OR total score and recidivism rates were both much higher than those of their community counterparts. However, there are concerns that the LSI-OR risk levels and recidivism rates are associated in a manner that does not reflect increasing recidivism rates in conjunction with increasing risk. Also, there is a question of the instrument lacking sensitivity to the custody offenders' dynamic needs, such as attitudes, values, and intentions, which must be evaluated for a valid pre-release assessment and for a variety of other reasons.

To this end, the Receiver Operating Characteristics (ROC) analyses were able markers of this potential problem of the LSI-OR instrument being unable to capture the dynamic needs of the youth sentenced to custody. This evidence is derived from the ROC AUCs, which shows that the Static factor of the LSI-OR is the singular one, which impacts on general and nonviolent recidivism of custody youth, the dynamic variables playing no significant predictive role. Several studies have examined the contribution of 'dynamic' risk factors in risk assessment, and have argued that risk assessments containing dynamic variables can be more accurate than risk assessments consisting of only static variables, although others found that historic variables were

sufficient (Rice, Harris, & Quinsey, 2002). Nevertheless, the LSI-OR instrument's insensitivity to the dynamic needs of offenders in custody is concerning, as it was designed to base its risk assessment on both types of needs, static and dynamic.

There is no definitive explanation as to why the LSI-OR instrument did not work equally well for the community and custody youth, except to say that the number of custody offenders was limited to 57, which might have lowered the statistical power to capture some of the existing effects (Green, 1992). One of the uncertainties deals with the generalizability of the current study's findings to other provincial offenders because of the significant overrepresentation of the institutional young offenders, as compared to the provincial average. Therefore, when generalizing to other young offenders in the province, it will be important to differentiate between the incarcerated youth and the youth on probation, in order to identify the proper set of norms and other findings.

The results of the current study indicate that the Level of Service Inventory-Ontario Revision (LSI-OR) instrument works most effectively for Caucasian male, community-sentenced young offenders, presenting with high sensitivity, specificity and diagnostic power in assessing the needs and in predicting recidivism of these offenders.

Regarding institutional young offenders, there is an additional problem with the distribution of their LSI-OR scores being potentially biased, likely overestimating the true LSI-OR mean for the institutional sample ($M = 19.72$). This is in comparison to the mean score reported by Girard (1999) for her small sample of southern Ontario young offenders, who were a mix of incarcerated and community-sentenced youth ($M = 13.9$). Caution is recommended when the current findings for the institutional sample are generalized to other incarcerated young offenders in the province since, potentially, the true population mean could be somewhat lower

from the one obtained in the present study which is, indeed, a very high score. It is recommended that future research on institutionalized young offenders include the whole range of (unbiased) LSI-OR scores by including lower risk young offenders, even with the shortest carcerate sentences. There is also one more reason for cross-validating the custody and replicating the community findings, that being their differing follow-up times. Custody offenders' follow up time was actually shorter than that of the community youth (mean difference = 57 days), which has a logical explanation in terms of the study design (i.e., custody offenders had to first be released from custody for their follow up time to begin). Thus, the custody offenders' actual recidivism rates could have potentially been higher, had they had a follow-up time equal to that of community offenders.

To prevent further bias, the multiple-regression models were tested on the entire sample, using Location as a control variable, which may have prevented chance fluctuations related to the smaller samples, resulting in potentially increased multiple R. Therefore, only small shrinkage of the multiple R upon cross-validation of young offenders models is expected (Tabachnick & Fidell, 1996). Due to the inclusion of the custody group in the survival analyses, the current results could have been somewhat less remarkable and they are not expected to be diminished upon cross-validation.

Returning to the entire young offenders sample, the homogeneous nature of the sample makes it relatively easy to discuss global results. However, the researcher wishes to highlight just a few interesting caveats, which have to do with how the methodology was applied. First of all, there were several multiple comparisons made in the current study, and a more stringent alpha level was applied ($\alpha = .05/15 = .003$; Howell, 1992) to the most essential comparisons. Pre-

and post- Bonferroni correction results are recognized within the respective tables and can be compared.

Further, there were too few numbers with respect to the immediate test-retest reliability investigation ($n = 3$; for 3 months or less between test and retest), and the instrument's reliability was not assessed in a traditional way, making it not easily comparable with other studies. The LSI-OR immediate test-retest reliability should be re-evaluated. Interestingly, there is an indication of the LSI-OR instrument being sensitive to true dynamic changes in young offenders over time but the instrument's dynamic validity should be established through future research. No studies have evaluated whether change in a variable purported to be dynamic is related to a parallel change in risk, "a requirement that must be met before it can be said that a variable is, in fact, dynamic risk factor." (Rice, Harris, & Quinsey, 2002).

Moreover, the theoretical and practical context for use of the 'override' (the professional discretion principle) needs to be clarified on the young offender population. In general, 'override' did not work in the current study. Once it was used, a slight decrease in the relationship between the LSI-OR risk level and the outcome measures occurred. Unfortunately, such a negative pattern of 'override' use occurred for both groups of offenders. Again, it is recommended that the MCS pursue research in regard to the manner in which professional discretion is utilized with young offenders.

Also, the use of Strengths in the LSI-OR assessment scheme should be clarified as soon as possible through further research. Total Strengths did not correlate with any measure of recidivism for youth in the current study. Again, the LSI-OR manual and training, which the agency (MCS) provides for the professionals who administer the LSI-OR instrument, are vague and nonspecific on its use of Strengths. The agency should pursue the use of Strengths through

further research. The importance of this type of information should not be underestimated, and it may be beneficial to include strengths 'formally' in the calculation of risk in a quantitative manner so that it can be used in a consistent and reliable fashion with all young offenders.

Beyond the above, the Family/marital subsection and Substance abuse of the General risk/needs factors (Section A) did not perform well in the current study. Both of these subsections failed to discriminate between the recidivists and non-recidivists of the current study. This is very surprising and contrasts with both past and current literature. Among the dynamic predictors identified in the Cottle et al. (2001) meta-analysis, variables in the family domain are important and include family instability and problematic interactions. Static predictors from among those in the family would be equally important to explore (Cottle et al., 2001), as they include a history of physical or sexual abuse, being raised in a single-parent home, and having a greater number of out-of-home placements. Overall, it appears that more content might help, but one has to keep in mind that the scale is used for both youth and adults. Regarding substance abuse, Cottle et al. (2002) found that it was significantly associated with recidivism of young offenders, although substance use was not.

One may also conjecture that more training for professionals conducting interviews with young offenders will be required in order to enhance their data gathering capabilities and knowledge of certain clinical facts as they apply to young offenders, as opposed to the adult offender. The fact to the matter may also be that the LSI-OR instrument was designed to assess the needs of adult offenders and, possibly, tends to over focus on problems and characteristics related to those issues relevant to adults problems, to the detriment of more in depth clinical inquiry focused on family dynamics, such as patterns of communication, family problem-solving, behavior control and affect.

As stated earlier, the Family/marital subsection and its alpha (.18) is the lowest of all the subsection alphas, while the remainder ranged from .58 (Antisocial patterns, total items) to .88 (Criminal History). Therefore, there is an indication that this subscale does not measure a unitary construct, at least not to the extent that the others do. It is recommended that the psychometric properties of the Family/marital subscale be further assessed on another sample of young offenders and improved upon if confirmed to be psychometrically weak.

Conclusion

In spite of some methodological, psychometric and other concerns related to how the LSI-OR instrument works on young offenders, who are Caucasian males from northern Ontario, and on their two (custody-community) subgroups, its has proven to be a good test of general, violent and nonviolent recidivism, especially for community youth. Although both groups were similar in many ways at their index offence, the LSI-OR instrument was able to elucidate the essential criminogenic differences between these two groups, predicting a higher risk for custody youth, which was validated by their proportionately higher rates of recidivism.

The LSI-OR met the ultimate test for its incremental predictive validity, when location of offenders was controlled for, to predict (binary) general, nonviolent, and violent recidivism. Although not thought to be criminogenic in nature, this current study further showed that Section G of the LSI-OR instrument worked to predict youths' general and nonviolent reoffending, above and beyond Location and Section A. Specifically, motivational factors and degree of denial/minimization differentiated between recidivists and nonrecidivists. This finding reveals the importance of a broad scope of dynamic needs, some of which may also be risk factors in young offenders. This is a constructive step toward recognizing that the LSI-OR instrument may

work somewhat differently on the young offender population than it does on adults. Replication of these results on another sample of young offenders is warranted.

The results may be useful for improvement of correctional classification of youth. The recommendation is being made to consider re-adjustment of the LSI-OR classification scheme for male young offenders, to reflect that, based on this current research, the low and medium risk groups' survival rates were not significantly different for all three types of recidivism.

Differentiation between risk levels was even less evident for violent recidivism.

The results may provide guidance for the development of alternative community programs to incarceration, which are more suitable for lower risk offenders and could be more suitable than incarceration for young offenders in general. Community young offenders demonstrated equally high levels of social, health and mental/health needs (Section F items) to those of custody offenders and community programs could be essential in addressing these needs. Despite not being more serious or violent at the index offence, the custody offenders re-offended at a significantly higher rate than youth from the community. It was established that the Location variable (custody-community) was a significant predictor of general and nonviolent recidivism (yes-no), within the context of its use with the LSI-OR variables, except for the prediction of violence.

Finally, this research demonstrated to the field staff that, in general, the LSI-OR was appropriate to use with male Caucasian young offenders, who are at least 16 years of age, although Family/marital subscale and Strengths were not predictive of recidivism and using 'override' with young offenders did not improve prediction.

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Appendix A. Risk/Needs Assessment Instruments-Special Offenders Groups

There have been significant developments in the assessment of offender risk among mentally disordered offenders (Harris, Rice, & Quinsey, 1993; Bonta, Law, & Hanson, 1998) and sex offenders (Hanson, 1998; Hanson & Harris, 1998; Hanson & Harris, 2000).

For example, The Violence Risk Appraisal Guide (VRAG), a 12-item tool, has shown impressive predictive validity for violent re-offending among mentally disordered and violent offenders (Harris, Rice & Quinsey, 1993; Rice & Harris, 1995). In addition to the well recognized in the prediction research variables, such as gender, age, and past criminal behaviour, the VRAG instrument includes other dynamic (i.e.: diagnostic and childhood history) variables, which require more expertise to assess. The 12 variables include psychopathy; victim injury in index offence (negatively related); schizophrenia (diagnosed on the basis of criteria in the Diagnostic and Statistical Manual of Mental Disorders, 3rd ed. [DSM-III], American Psychiatric Association [APA, 1980], negatively related); never married; elementary school maladjustment; female victim-index offense (negatively related); failure on prior conditional release; property offence history; age at index offense (negatively related); alcohol abuse history; and DSM-III personality disorder. With an average follow-up period of 81.5 months, the VRAG had a classification accuracy rate of about 75% (Borum, 1996).

The Historical, Clinical and Risk Management Scheme (HCR-20) was developed by Webster, Douglas, Eaves and Hart (1997), and “offers a promising integration of clinical and actuarial information for forensic applications (Bonta & Cormier, 1999, p. 237).” The HCR-20 is an instrument-guide, a checklist of 20 past, present and future risk markers to assess risk for violence in mentally disordered correctional, forensic and civil psychiatric settings. Briefly, the

first 10 items of the HCR-20 pertain to the historical, or static, variables of the individual being assessed (H Scale), the next five items reflect the current clinical status (C Scale), and the remaining five pertain to future risk of violent behaviour (R Scale) (Borum, 1996). It has a fairly clearly defined three-level scoring system for each item, similar to that of the Psychopathy Checklist-Revised (Hare, 1991), yet “it currently cannot be considered a test in the formal sense” (Borum, 1996, p. 949).

With respect to the assessment and risk management of sexual offenders, Hanson (1998), Hanson and Harris (1998) and Hanson and Harris (2000²) have recently moved beyond the assessment of static risk factors to study potentially dynamic risk factors. Also, Boer, Wilson, Gautier and Hart (1997) identified a set of 20 factors that, in their opinion, should be considered in any minimally comprehensive sexual violence risk assessment³. It is interesting to note that many factors included in their Sexual Violence Risk-20 (SVR-20) appear in many schemes for the assessment of risk for general violence. This means that they predict general violence as well as sexual violence (Boer, Wilson, Gautier and Hart, 1997).

An instrument designed for a more narrowly specified population and type of violence, the Spousal Assault Risk Assessment Guide (SARA⁴) was developed. It is a 20-item clinical checklist of risk factors for spousal assault (Borum, 1996). Like the HCR-20 it is brief, based on the empirical literature, and has an operationally defined three-level scoring scheme. It is constructed as a clinical guide, and not as a formal test (Borum, 1996).

² For more specific information regarding the unique contribution of dynamic predictors of sexual recidivism refer to Hanson and Harris (2000).

³ See p.332 in Boer, Wilson, Gautier, & Hart (2000) for The Sexual Violence Risk-20 (SVR-20) tool's twenty factors to be considered when assessing risk for sexual violence. They belong to three categories: Psychosocial Adjustment, Sexual Offending, and Future Plans. Most of these factors are historical in nature, reflecting fixed or relatively stable characteristics, whereas others reflect both past and current functioning. Some factors have dynamic aspects.

The Canadian research has made a major contribution to the assessment of psychopathy (Hare, 1996). The Psychopathy Checklist-Revised (PCL-R) “has become the actuarial standard for assessment of psychopathy and has shown impressive validity with respect to the prediction of violent behaviour (Bonta & Cormier, 1999, p. 237).” Forth, Hart and Hare have modified the PCL-R for use with young offenders. The instrument was used in the study of 95 male young offenders incarcerated in secure detention institutions (Forth & Tobin, 1995). Forth and Tobin’s study shows that approximately 37% of the young offenders in their sample were classified psychopathic, substantially higher than the results normally reported for adult male offenders (15% to 25%). They speculate that, possibly, some general characteristics of adolescence, such as impulsiveness or irresponsibility, contribute to the higher score.

Some recently developed instruments have used multiple known risk factors and correlates of youth antisocial behaviour to guide predictions of future risk for criminality and violence. Two such risk assessments are the Structured Assessment of Violence Risk in Youth (SAVRY) by Borum, Bartel and Forth (Catchpole & Gretton, 2003) and Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 2002). The YLS/CMI is a 42-item inventory that assesses 8 categories of criminogenic factors. It was extensively described in the body of this document (titled Existing Youth Risk/Need Devices). The instrument was developed from the LSI-OR based on the General Personality and Social Psychological Model of Criminal Conduct that attributes the causes of youth criminality to both characteristics and circumstances of the youths (Andrews & Bonta, 1998). It further suggests that interventions with high-risk youths can be effective in reducing recidivism if they target criminogenic needs of youths.

⁴ Information about The Spousal Assault Risk Assessment Guide was obtained from The British Columbia Institute

The SAVRY by Borum and colleagues (Catchpole & Gretton, 2003) is a tool designed to assist clinicians in evaluating risk for violence in an adolescent population. Its structure is based on the HCR-20, a 20-item adult instrument that examines historical, clinical and risk management variables associated with violent behaviour. The SAVRY includes 10 historical risk factors, 6 social-contextual risk factors, 8 individual-clinical (including psychopathy), and 6 protective factors, all derived from literature on correlates of violence. At this point only a few data are available on the psychometric properties of the SAVRY, but its concurrent validity with the YLS/CMI was .83 and with the LCL: YV was .73 in a sample of incarcerated youth (Catchpole & Gretton, 2003).

Appendix B. The Level of Service Inventory: Ontario Revision (LSI-OR)

System of Information (F.D.I.) Notice: This personal information is being collected under the authority of Section 5 of the Ministry of Correctional Services Act (RSC 1980, Chapter M22) and may be used for the purposes of assessment, classification and program placement during this and future periods of community supervision or incarceration. Questions about the collection of this information should be directed to the Probation and Parole Officer, Area Manager, or Superintendent.

Surname	Given Name	OMS Client Number	Status	___ Youth ___ Adult
Setting	Sources of Information	Birthdate	DD MM YY	___ Male ___ Female
Context: Community		Institution		
___ PSR/PDR	___ Parole Intake	___ Classification	___ Internal/Program	___ Community Release
___ Probation Intake	___ P&P Reassessment	___ Reclassification	___ Parole Hearing	___ Secure Custody
				___ Open Custody

A. GENERAL RISK/NEED FACTORS

1. CRIMINAL HISTORY

- ___ 1 Any prior y.o. dispositions (number =)
- ___ 2 Two or more prior adult/youth dispositions
- ___ 3 Three or more prior adult/youth dispositions
- ___ 4 Three or more present offences (number =)
- ___ 5 Arrested or charged under age 16
- ___ 6 Ever incarcerated upon adjudication
- ___ 7 Ever punished for institutional misconduct/behaviour report (number =)
- ___ 8 Charge laid, probation breached or parole suspended during prior community supervision
- ___ Subtotal Strength ___

2. EDUCATION/EMPLOYMENT

- ___ 9 Currently unemployed
- ___ 10 Frequently unemployed
- ___ 11 Never employed for full year
- ___ 12 Less than regular grade 10 or equivalent
- ___ 13 Less than regular grade 12 or equivalent
- ___ 14 Suspended or expelled at least once
- ___ 15 Participation/Performance ()
- ___ 16 Peer interactions ()
- ___ 17 Authority interactions ()
- ___ Subtotal Strength ___

3. FAMILY/MARITAL

- ___ 18 Dissatisfaction with marital or equivalent situation ()
- ___ 19 Nonrewarding, parental ()
- ___ 20 Nonrewarding, other relatives ()
- ___ 21 Criminal - Family/Spouse
- ___ Subtotal Strength ___

4. LEISURE/RECREATION

- ___ 22 No recent participation in an organized activity
- ___ 23 Could make better use of time ()
- ___ Subtotal Strength ___

5. COMPANIONS

- ___ 24 Some criminal acquaintances
- ___ 25 Some criminal friends
- ___ 26 No anti-criminal acquaintances
- ___ 27 No anti-criminal friends ()
- ___ Subtotal Strength ___

6. PROCRIMINAL ATTITUDE/ORIENTATION

- ___ 28 Supportive of crime ()
- ___ 29 Unfavourable toward convention ()
- ___ 30 Poor, toward sentence/offence
- ___ 31 Poor, toward supervision/treatment
- ___ Subtotal Strength ___

7. SUBSTANCE ABUSE

- ___ 32 Alcohol problem, ever
- ___ 33 Drug problem, ever
- ___ 34 Alcohol problem, currently ()
- ___ 35 Drug problem, currently ()
- ___ 36 Law violations
- ___ 37 Marital/Family
- ___ 38 School/Work
- ___ 39 Medical or other clinical indicators
- ___ Subtotal Strength ___

8. ANTISOCIAL PATTERN

- ___ 40 Specialized assessment for Antisocial pattern
- ___ 41 Early and diverse antisocial behaviour. Arrested/charged under age 16 (Item 5), plus at least one of:
 - a) official record of assault/ violence ()
 - b) escape history ()
 - c) charge laid, probation breached or parole suspended during prior community supervision (Item 8)
- ___ 42 Criminal attitude. At least one of: (Item 28), (Item 29), (Item 31)
- ___ 43 A pattern of generalized trouble. At least four of:
 - Financial problems (),
 - 3 or more address changes ()
 - (Item 11), (Item 12),
 - (Item 14), (Item 19),
 - (Item 23), (Item 27)
- ___ Subtotal Strength ___

B. SPECIFIC RISK/NEED FACTORS

1. PERSONAL PROBLEMS WITH CRIMINOGENIC POTENTIAL

- ___ 1 Clear problems of compliance (specific conditions)
- ___ 2 Diagnosis of "psychopathy"
- ___ 3 Diagnosis of other personality disorder
- ___ 4 Threat from third party
- ___ 5 Problem-solving/self-management skill deficits
- ___ 6 Anger management deficits
- ___ 7 Intimidating/Controlling
- ___ 8 Inappropriate sexual activity
- ___ 9 Poor social skills
- ___ 10 Peers outside age range
- ___ 11 Racist/sexist behaviour
- ___ 12 Underachievement
- ___ 13 Outstanding charges
- ___ 14 Other (specify) _____

2. HISTORY OF PERPETRATION

- ___ 1 Sexual assault (extrafamilial)
- ___ 2 Sexual assault (intrafamilial)
- ___ 3 Physical assault (extrafamilial)
- ___ 4 Physical assault (intrafamilial)
- ___ 5 Assault on an authority figure
- ___ 6 Weapon use
- ___ 7 Fire setting
- ___ 8 Escapes/U.A.L.
- ___ 9 Impaired Driving

C. PRISON EXPERIENCE: INSTITUTIONAL FACTORS

- ___ 1 Last classification maximum
- ___ 2 Last classification medium
- ___ 3 Last classification minimum
- ___ 4 Protective custody
- ___ 5 Treatment recommended/ordered
- ___ 6 Misconduct/Behaviour Report current incarceration (number =)
- ___ 7 Administrative segregation
- ___ 8 Security management concerns
- ___ 9 Past federal penitentiary

D. RISK/NEED SUMMARYTotal LSI-OR Score _____
(From Section A)Total Strengths _____
(From Section A)Specific risk/need factors _____
(From Section B)

Summary of strengths (Positives: reasons for lowering security/supervision or releasing clients, From Section A)

Summary of added concerns (Negatives: reasons for increasing security/supervision or not releasing clients, From Sections B & C)

E. RISK/NEED PROFILE

Very High	-	-	-	-	-	-	-	-	30+	Very High
High	7-8	-	-	-	4	4	-	4	20-29	High
Medium	5-6	8-9	3-4	2	3	3	6-8	2-3	11-19	Medium
Low	3-4	3-7	1-2	1	1-2	1-2	2-5	1	5-10	Low
Very Low	0-2	0-2	0	0	0	0	0-1	0	0-4	Very Low
Risk Category	Crim. Hist.	Employ. Educ.	Fam. Mar.	Leis. Rec.	Comp.	Procr. Artit.	Subs. Abuse	Antisoc. Pattern	Total (Section A)	Override: Yes No

F. OTHER CLIENT ISSUES**1. SOCIAL, HEALTH, AND MENTAL HEALTH**

- ☐ 1 Financial problems
- ☐ 2 Homeless or transient
- ☐ 3 Accommodation problems
- ☐ 4 Health problems
- ☐ 5 Depressed
- ☐ 6 Physical disability
- ☐ 7 Low self-esteem
- ☐ 8 Shy/withdrawn
- ☐ 9 Diagnosis of psychosis
- ☐ 10 Suicide attempts/threat
- ☐ 11 Learning disability
- ☐ 12 Other evidence of emotional distress
(Specify) _____

- ☐ 13 Immigration issues
- ☐ 14 Victim: family violence
- ☐ 15 Victim: physical assault
- ☐ 16 Victim: sexual assault
- ☐ 17 Victim: emotional abuse
- ☐ 18 Victim of neglect
- ☐ 19 Other (specify) _____

2. BARRIER TO RELEASE

- ☐ 1 Community supervision inappropriate

(Specify reason) _____

G. SPECIAL RESPONSIVITY CONSIDERATIONS

- ☐ 1 Motivation as a barrier
- ☐ 2 Engages in denial/minimization
- ☐ 3 Interpersonally anxious
- ☐ 4 Cultural issues
- ☐ 5 Ethnicity issues
- ☐ 6 Low intelligence
- ☐ 7 Communication barriers
- ☐ 8 Other (specify) _____

H. PROGRAM/PLACEMENT DECISION

Type of Decision	Recommendation/Decision	Program/Institutional Placement
☐ Institution, Secure/Open Custody:	☐ Minimum ☐ Medium ☐ Maximum	
☐ Release Recommendation:	☐ Yes ☐ No	
☐ Community:	☐ Minimum ☐ Moderate ☐ Maximum	
Comments		
Assessor's Name Assessor's Position Assessor's Signature DD MM YY		
Placement Decision Explanation (if different from above)		
Authorizing Name Authorizing Position Authorizing Signature DD MM YY		

Appendix C. Offence Categories (Ministry of Correctional Services)

Severity	Offence category	Severity	Offence category
01*	Homicide & related	14	Obstruction of justice
02*	Serious violent	15	Drug possession
03*	Violent sexual	16	Criminal code traffic
04	Break & enter & related	17	Breach of court order/escape
05*	Nonviolent sexual	18	Drinking driving
06	Traffic/import drug	19	Misc. against public order
07*	Weapons	20	Other federal statute
08	Fraud & related	21	Parole violations
09*	Misc. against the person	22	Highway traffic act
10	Theft/possession	23	Liquor licence act
11*	Assault & related	24	Other provincial
12*	Arson/property damage	25	Municipal bylaw
13	Morals & gaming	26	Unknown

Note. * refers to violent offences.

Appendix D. Scree Plot for Factor Analysis

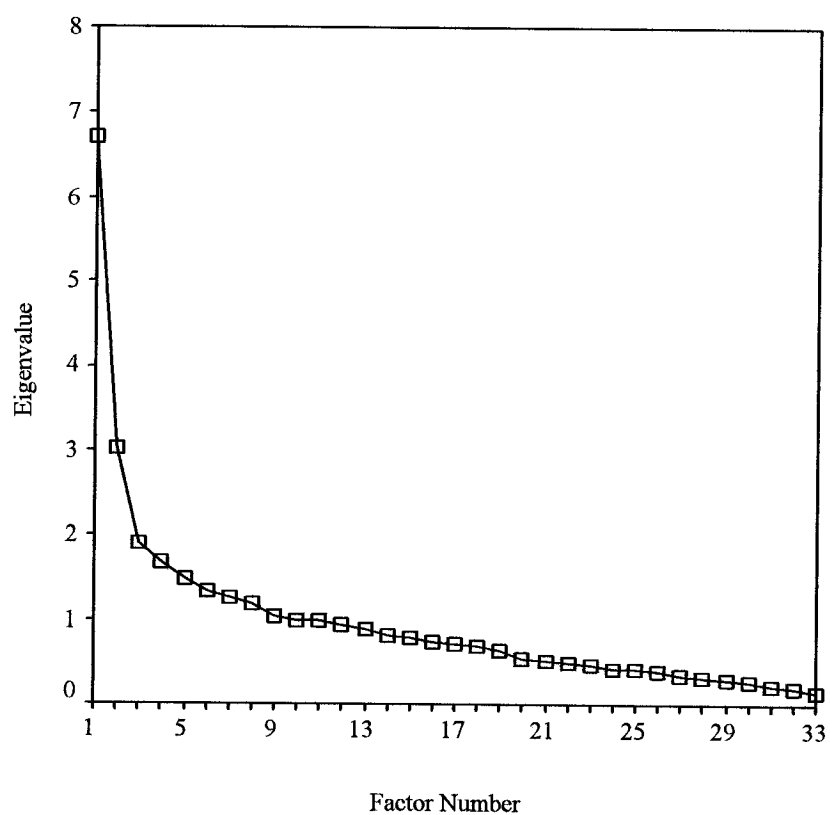


Figure D. Scree Plot for the exploratory factor analysis on 33 items from LSI-OR Section A (eight subsections).

Appendix E. Intercorrelations Between Outcome Variables

Table E1 provides a Pearson intercorrelation matrix of the association between 24 recidivism variables. The association between the following recidivism variables is described: general recidivism (yes-no), nonviolent recidivism (yes-no), violent recidivism (yes-no), number of charges, number of nonviolent charges, number of violent charges, number of convictions, number of nonviolent convictions, number of violent convictions, most serious offence total, most serious conviction, number of charge types, number of conviction types (diversity), number of recidivism sets, number of breach convictions, number of breaches total, number of fines, number of suspended sentences, number of conditional sentences, number of intermittent sentences, number of withdrawn charges, number of outstanding charges, sentence length- custody, and sentence length- probation.

In Tables E2 and E3, intercorrelations between the same set of recidivism variables are presented by location. Table E2 is for custody offenders and Table E3 for community offenders.

Table E1

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	No. charges	No. nonviolent charges
General recidivism ¹	-				
Nonviolent recid. ¹	.925***	-			
Violent recidivism ¹	.496***	.341***	-		
No. charges	.627***	.653***	.473***	-	
No. nonviolent charg.	.593***	.627***	.340***	.969***	-
No. violent charges	.400***	.384***	.664***	.555***	.334***
No. convictions	.626***	.658***	.445***	.960***	.951***
No. nonviolent conv.	.585***	.632***	.299***	.924***	.959***
No. violent convict.	.390***	.332***	.787***	.482***	.284***
MSO, total	.963***	.917***	.476***	.704***	.662***
MSO, convictions	.990***	.926***	.494***	.639***	.602***
No. charge types	.765***	.781***	.585***	.900***	.836***
No. convict. types	.767***	.788***	.600***	.880***	.826***

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	No. charges	No. nonviolent charges
No. recidivism sets	.697***	.708***	.460***	.869***	.859***
No. breach convict.	.583***	.622***	.380***	.873***	.884***
No. breaches	.608***	.627***	.430***	.890***	.891***
No. fines	.336***	.364***	.203*	.305***	.318***
No. suspended senten.	.272**	.215**	.205*	.186*	.193*
No. condition. sentenc.	.113	.007	.228**	.037	.006
No. intermit. Sentenc.	.221**	.239**	.322***	.348***	.319***
No. withdrawn charges	.302***	.326***	.338***	.707***	.640***
No. outstand. Charges	.331***	.299***	.195*	.365***	.335***
Sentenc.length,custod. ²	.429***	.458***	.335***	.679***	.632***
Sentenc length,probat. ²	.534***	.507***	.315***	.598***	.568***

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges	-				
No. convictions	.463***	-			
No. nonviolent conv.	.297***	.979***	-		
No. violent convict.	.885***	.429***	.234**	-	
MSO, total	.460***	.694***	.649***	.431***	-
MSO, convictions	.412***	.638***	.597***	.394***	.967***
No. charge types	.623***	.843***	.781***	.557***	.826***
No. convict. types	.579***	.867***	.803***	.569***	.819***

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
No. recidivism sets	.425***	.857***	.824***	.428***	.742***
No. breach convict.	.355***	.907***	.903***	.321***	.640***
No. breaches	.400***	.902***	.887***	.367***	.673***
No. fines	.092	.294***	.283***	.147	.323***
No. suspended senten.	.062	.131	.120	.095	.278***
No. condition. sentenc.	.122	.039	-.008	.218**	.083
No. intermit. Sentenc.	.256**	.342***	.303***	.283***	.214**
No. withdrawn charges	.546***	.540***	.476***	.462***	.364***
No. outstand. Charges	.265**	.198*	.194*	.085	.371***
Sentenc.length,custod. ²	.465***	.658***	.609***	.435***	.528***
Sentenc length,probat. ²	.374***	.593***	.562***	.332***	.564

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

LSI-OR variables	MSO, convictions	No. charge types	No. convict. types	No. recidivism sets	No. breach convict.
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges					
No. convictions					
No. nonviolent conv.					
No. violent convict.					
MSO, total					
MSO, convictions	-				
No. charge types	.773 ^{***}	-			
No. convict. types	.779 ^{***}	.968 ^{***}	-		

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

LSI-OR variables	MSO, convictions	No. charge types	No. convict. types	No. recidivism sets	No. breach convict.
No. recidivism sets	.706 ^{***}	.845 ^{***}	.861 ^{***}	-	
No. breach convict.	.596 ^{***}	.778 ^{***}	.788 ^{***}	.815 ^{***}	-
No. breaches	.619 ^{***}	.812 ^{***}	.806 ^{***}	.823 ^{***}	.978 ^{***}
No. fines	.319 ^{***}	.415 ^{***}	.411 ^{***}	.445 ^{***}	.335 ^{***}
No. suspended senten.	.280 ^{***}	.228 ^{**}	.170 [*]	.181 [*]	.128
No. condition. sentenc.	.059	.091	.092	.052	.108
No. intermit. Sentenc.	.228 ^{**}	.351 ^{***}	.390 ^{***}	.360 ^{***}	.327 ^{***}
No. withdrawn charges	.301 ^{***}	.637 ^{***}	.581 ^{***}	.588 ^{***}	.483 ^{***}
No. outstand. Charges	.341 ^{***}	.420 ^{***}	.281 ^{***}	.248 ^{**}	.210 ^{**}
Sentenc.length,custod. ²	.441 ^{***}	.608 ^{***}	.604 ^{***}	.637 ^{***}	.512 ^{***}
Sentenc length,probat. ²	.540 ^{***}	.526 ^{***}	.511 ^{***}	.465 ^{***}	.459 ^{***}

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

	No.	No.	No.	No.	No.
	No.		suspended	condition.	intermit.
LSI-OR variables	breaches	No. fines	sentenc	sentenc.	sentenc.
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges					
No. convictions					
No. nonviolent conv.					
No. violent convict.					
MSO, total					
MSO, convictions					
No. charge types					
No. convict. types					

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

LSI-OR variables	No. breaches	No. fines	No. suspended sentenc	No. condition. sentenc.	No. intermit. sentenc.
No. recidivism sets					
No. breach convict.					
No. breaches	-				
No. fines	.324***	-			
No. suspended senten.	.157	.154	-		
No. condition. sentenc.	.099	.081	-.032	-	
No. intermit. Sentenc.	.334***	.342***	-.062	.194*	-
No. withdrawn charges	.519***	.206*	.140	.008	.310***
No. outstand. Charges	.273**	.131	.283***	.026	.009
Sentenc.length,custod. ²	.569***	.071	-.059	-.022	.229**
Sentenc length,probat. ²	.486***	.218**	.411***	.109	.324***

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

	No.	No.	Sentence	Sentence
	withdrawn	outstand.	length	length
LSI-OR variables	charges	charges	custody ²	probat. ²
General recidivism ¹				
Nonviolent recid. ¹				
Violent recidivism ¹				
No. charges				
No. nonviolent charg.				
No. violent charges				
No. convictions				
No. nonviolent conv.				
No. violent convict.				
MSO, total				
MSO, convictions				
No. charge types				
No. convict. types				

Table E1 (continued)

Pearson Correlations Between Recidivism Variables for the Total Sample (N=154)

	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
LSI-OR variables				
No. recidivism sets				
No. breach convict.				
No. breaches				
No. fines				
No. suspended senten.				
No. condition. sentenc.				
No. intermit. Sentenc.				
No. withdrawn charges	-			
No. outstand. charges	.158	-		
Sentenc.length,custod. ²	.410 ^{***}	.247 ^{**}	-	
Sentenc length,probat. ²	.361 ^{***}	.235 ^{**}	.359 ^{***}	-

Note. ¹ yes-no. ² length in days. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table E2

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	No. charges	No. nonviolent charges
General recidivism ¹	-				
Nonviolent recid. ¹	.880***	-			
Violent recidivism ¹	.373**	.172	-		
No. charges	.502***	.553***	.438**	-	
No. nonviolent charg.	.463***	.520***	.300*	.977***	-
No. violent charges	.357**	.352**	.734***	.486***	.286*
No. convictions	.507***	.554***	.359**	.964***	.967***
No. nonviolent conv.	.475***	.540***	.208	.923***	.961***
No. violent convict.	.306*	.234	.820***	.480***	.315*
MSO, total	.941***	.895***	.357**	.601***	.556***
MSO, convictions	.978***	.897***	.355**	.527***	.484***
No. charge types	.643***	.684***	.557***	.863***	.781***
No. convict. types	.644***	.677***	.535***	.867***	.805***

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	No. charges	No. nonviolent charges
No. recidivism sets	.555 ^{***}	.575 ^{***}	.434 ^{**}	.880 ^{***}	.858 ^{***}
No. breach convict.	.496 ^{***}	.542 ^{***}	.351 ^{**}	.882 ^{***}	.888 ^{***}
No. breaches	.511 ^{***}	.560 ^{***}	.385 ^{**}	.898 ^{***}	.887 ^{***}
No. fines	.272 [*]	.310 [*]	.150	.254	.260 [*]
No. suspended sentenc.	.175	.199	.251	.259	.250
No. condition. sentenc.	.114	-.076	.305 [*]	-.009	-.048
No. intermit. sentenc.	.213	.242	.371 ^{**}	.402 ^{**}	.353 ^{**}
No. withdrawn charges	.218	.248	.448 ^{***}	.731 ^{***}	.682 ^{***}
No. outstand. Charges	.258	.294 [*]	.148	.211	.154
Sentenc.length,custod. ²	.355 ^{**}	.391 ^{**}	.349 ^{**}	.634 ^{***}	.563 ^{***}
Sentenc length,probat. ²	.372 ^{**}	.376 ^{**}	.169	.529 ^{***}	.556 ^{***}

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

LSI-OR variables	No.				
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	MSO, total
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges	-				
No. convictions	.366**	-			
No. nonviolent conv.	.206	.981***	-		
No. violent convict.	.858***	.391**	.203	-	
MSO, total	.418**	.601***	.561***	.370**	-
MSO, convictions	.381**	.530***	.499***	.307*	.960***
No. charge types	.669***	.783***	.710***	.575***	.729***
No. convict. types	.589***	.831***	.764***	.567***	.727***

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
No. recidivism sets	.433**	.859***	.814***	.468***	.628***
No. breach convict.	.321*	.888***	.870***	.351**	.589***
No. breaches	.395**	.892***	.857***	.433**	.615***
No. fines	.074	.230	.225	.094	.228
No. suspended sentenc.	.136	.204	.186	.145	.206
No. condition. sentenc.	.156	-.008	-.070	.286*	.059
No. intermit. sentenc.	.355**	.379**	.328*	.355**	.220
No. withdrawn charges	.485***	.572***	.501***	.506***	.288*
No. outstand. Charges	.314*	.084	.080	.043	.276*
Sentenc.length,custod. ²	.536***	.633***	.538***	.636***	.494***
Sentenc length,probat. ²	.098	.572***	.570***	.179	.403**

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

LSI-OR variables	MSO, convictions	No. charge types	No. convict. types	No. recidivism sets	No. breach convict.
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges					
No. convictions					
No. nonviolent conv.					
No. violent convict.					
MSO, total					
MSO, convictions	-				
No. charge types	.671 ^{***}	-			
No. convict. types	.668 ^{***}	.959 ^{***}	-		

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

LSI-OR variables	MSO, convictions	No. charge types	No. convict. types	No. recidivism sets	No. breach convict.
No. recidivism sets	.573 ^{***}	.821 ^{***}	.862 ^{***}	-	
No. breach convict.	.519 ^{***}	.771 ^{***}	.805 ^{***}	.832 ^{***}	-
No. breaches	.535 ^{***}	.808 ^{***}	.839 ^{***}	.859 ^{***}	.985 ^{***}
No. fines	.217	.348 ^{**}	.327 [*]	.406 ^{**}	.364 ^{**}
No. suspended sentenc.	.187	.303 [*]	.156	.230	.273 [*]
No. condition. sentenc.	.013	.068	.071	.010	.107
No. intermit. sentenc.	.227	.399 ^{**}	.455 ^{***}	.410 ^{**}	.422 ^{**}
No. withdrawn charges	.233	.692 ^{***}	.684 ^{***}	.659 ^{***}	.553 ^{***}
No. outstand. Charges	.276 [*]	.326 [*]	.116	.096	.185
Sentenc.length,custod. ²	.379 ^{**}	.545 ^{***}	.575 ^{***}	.639 ^{***}	.489 ^{***}
Sentenc length,probat. ²	.389 ^{**}	.362 ^{**}	.358 ^{**}	.422 ^{**}	.451 ^{***}

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

	No.	No.	No.	No.	No.
LSI-OR variables	breaches	No. fines	suspended sentenc	condition. sentenc.	intermit. sentenc.
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges					
No. convictions					
No. nonviolent conv.					
No. violent convict.					
MSO, total					
MSO, convictions					
No. charge types					
No. convict. types					

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

LSI-OR variables	No. breaches	No. fines	No. suspended sentenc	No. condition. sentenc.	No. intermit. sentenc.
No. recidivism sets					
No. breach convict.					
No. breaches	-				
No. fines	.359**	-			
No. suspended sentenc.	.257	.229	-		
No. condition. sentenc.	.098	.090	-.056	-	
No. intermit. sentenc.	.451***	.415**	-.104	.174	-
No. withdrawn charges	.592***	.153	.119	-.014	.383**
No. outstand. Charges	.176	.221	.448***	.020	-.011
Sentenc.length,custod. ²	.584***	.052	-.052	-.076	.254
Sentenc length,probat. ²	.459***	.142	.416**	.115	.359**

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

	No.	No.	Sentence	Sentence
	withdrawn	outstand.	length	length
LSI-OR variables	charges	charges	custody ²	probat. ²
General recidivism ¹				
Nonviolent recid. ¹				
Violent recidivism ¹				
No. charges				
No. nonviolent charg.				
No. violent charges				
No. convictions				
No. nonviolent conv.				
No. violent convict.				
MSO, total				
MSO, convictions				
No. charge types				
No. convict. types				

Table E2 (continued)

Pearson Correlations Between Recidivism Variables for the Custody Offenders (n=57)

	No.	No.	Sentence	Sentence
	withdrawn	outstand.	length	length
LSI-OR variables	charges	charges	custody ²	probat. ²
No. recidivism sets				
No. breach convict.				
No. breaches				
No. fines				
No. suspended senten.				
No. condition. sentenc.				
No. intermit. sentenc.				
No. withdrawn charges	-			
No. outstand. Charges	-.006	-		
Sentenc.length,custod. ²	.385**	.002	-	
Sentenc length,probat. ²	.178	.184	.295*	-

Note. ¹ yes/no. ² length in days. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table E3

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

LSI-OR variables	General recidivism ¹	Nonviolent recidivism ¹	Violent recidivism ¹	No. charges	No. nonviolent charges
General recidivism ¹	-				
Nonviolent recid. ¹	.935***	-			
Violent recidivism ¹	.557***	.415***	-		
No. charges	.693***	.704***	.477***	-	
No. nonviolent charg.	.676***	.698***	.339**	.954***	-
No. violent charges	.381***	.357**	.597***	.605***	.338**
No. convictions	.685***	.712***	.503***	.946***	.919***
No. nonviolent conv.	.633***	.677***	.348***	.908***	.947***
No. violent convict.	.416***	.361***	.748***	.450***	.189
MSO, total	.967**	.913***	.532***	.773***	.745***
MSO, convictions	.995***	.928***	.566***	.697***	.678***
No. charge types	.820***	.820***	.587***	.929***	.885***
No. convict. types	.821***	.839***	.638***	.878***	.832***

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

LSI-OR variables	General	Nonviolent	Violent	No.	
	recidivism ¹	recidivism ¹	recidivism ¹	No. charges	nonviolent charges
No. recidivism sets	.784***	.791***	.450***	.825***	.833***
No. breach convict.	.592***	.633***	.364***	.851***	.879***
No. breaches	.628***	.629***	.433***	.882***	.904***
No. fines	.345**	.369***	.220*	.313**	.344**
No. suspended sentenc.	.346**	.230*	.162	.111	.131
No. condition. sentenc.	-	-	-	-	-
No. intermit. sentenc.	.133	.142	.239*	.046	.036
No. withdrawn charges	.360***	.385***	.176	.666***	.549**
No. outstand. Charges	.359***	.283**	.214*	.508***	.520***
Sentenc.length,custod. ²	.432***	.462***	.274**	.692***	.678***
Sentenc length,probat. ²	.656***	.598***	.439***	.656***	.546***

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges	-				
No. convictions	.529***	-			
No. nonviolent conv.	.334**	.971***	-		
No. violent convict.	.908***	.432***	.204*	-	
MSO, total	.449***	.750***	.696***	.446***	-
MSO, convictions	.387***	.693***	.640***	.423***	.964***
No. charge types	.566***	.889***	.828***	.515***	.877***
No. convict. types	.546***	.889***	.819***	.549***	.863***

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
No. recidivism sets	.378***	.821***	.801***	.342**	.819***
No. breach convict.	.337**	.927***	.941***	.246*	.634***
No. breaches	.365***	.918***	.925***	.267**	.679***
No. fines	.070	.316**	.300**	.164	.351***
No. suspended sentenc.	-.001	.049	.041	.044	.336**
No. condition. sentenc.	-	-	-	-	-
No. intermit. Sentenc.	.048	.075	.055	.099	.089
No. withdrawn charges	.629***	.461***	.397***	.393***	.431***
No. outstand. Charges	.2148	.282**	.280**	.098	.417***
Sentenc.length,custod ²	.371***	.636***	.648***	.158	.521***
Sentenc length,probat. ²	.609***	.585***	.511***	.470***	.690***

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

LSI-OR variables	MSO, convictions	No. charge types	No. convict. types	No. recidivism sets	No. breach convict.
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges					
No. convictions					
No. nonviolent conv.					
No. violent convict.					
MSO, total					
MSO, convictions	-				
No. charge types	.817***	-			
No. convict. types	.829***	.969***	-		

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

LSI-OR variables	MSO, convictions	No. charge types	No. convict. types	No. recidivism sets	No. breach convict.
No. recidivism sets	.789 ^{***}	.842 ^{***}	.836 ^{***}	-	
No. breach convict.	.602 ^{***}	.751 ^{***}	.742 ^{***}	.774 ^{***}	-
No. breaches	.632 ^{***}	.792 ^{***}	.752 ^{***}	.771 ^{***}	.970 ^{***}
No. fines	.351 ^{***}	.443 ^{***}	.452 ^{***}	.456 ^{***}	.267 ^{**}
No. suspended sentenc.	.352 ^{***}	.165	.178	.131	-.005
No. condition. sentenc.	-	-	-	-	-
No. intermit. Sentenc.	.135	.151	.185	.088	.025
No. withdrawn charges	.344 ^{**}	.572 ^{***}	.444 ^{***}	.463 ^{***}	.373 ^{***}
No. outstand. Charges	.365 ^{***}	.490 ^{***}	.392 ^{***}	.368 ^{***}	.202 [*]
Sentenc.length,custod. ²	.439 ^{***}	.629 ^{***}	.585 ^{***}	.572 ^{***}	.482 ^{***}
Sentenc length,probat. ²	.654 ^{***}	.671 ^{***}	.640 ^{***}	.467 ^{***}	.427 ^{***}

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

			No. suspended sentenc	No. condition. sentenc.	No. intermit. sentenc.
LSI-OR variables	No. breaches	No. fines			
General recidivism ¹					
Nonviolent recid. ¹					
Violent recidivism ¹					
No. charges					
No. nonviolent charg.					
No. violent charges					
No. convictions					
No. nonviolent conv.					
No. violent convict.					
MSO, total					
MSO, convictions					
No. charge types					
No. convict. types					

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

LSI-OR variables	No. breaches	No. fines	No. suspended sentenc	No. condition. sentenc.	No. intermit. sentenc.
No. recidivism sets					
No. breach convict.					
No. breaches	-				
No. fines	.253*	-			
No. suspended sentenc.	.069	.085	-		
No. condition. sentenc.	-	-	-	-	
No. intermit. Sentenc.	.018	.212*	-.027	-	-
No. withdrawn charges	.421***	.250*	.167	-	-.028
No. outstand. Charges	.326**	.039	.159	-	-.028
Sentenc.length,custod. ²	.510***	.030	-.088	-	-.015
Sentenc length,probat. ²	.480***	.266**	.413***	-	.195

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

	No.	No.	Sentence	Sentence
	withdrawn	outstand.	length	length
LSI-OR variables	charges	charges	custody ²	probat. ²
General recidivism ¹				
Nonviolent recid. ¹				
Violent recidivism ¹				
No. charges				
No. nonviolent charg.				
No. violent charges				
No. convictions				
No. nonviolent conv.				
No. violent convict.				
MSO, total				
MSO, convictions				
No. charge types				
No. convict. types				

Table E3 (continued)

Pearson Correlations Between Recidivism Variables for the Community Offenders (n=97)

	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
LSI-OR variables				
No. recidivism sets				
No. breach convict.				
No. breaches				
No. fines				
No. suspended senten.				
No. condition. sentenc.				
No. intermit. Sentenc.				
No. withdrawn charges	-			
No. outstand. Charges	.333**	-		
Sentenc.length,custod. ²	.409***	.480***	-	
Sentenc length,probat. ²	.612***	.267**	.389***	-

Note. ¹ yes/no. ² length in days. * $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix F. Pearson Correlation Matrices Between LSI-OR Variables and Recidivism Variables

Table F1 provides a Pearson correlation matrix of the association between the 20 LSI-OR variables and 24 recidivism variables for the total sample of young offenders ($N=154$). It is of note, that the Initial LSI-OR risk level demonstrated consistently higher associations with the recidivism variables than did the Final risk level. Also, surprisingly, Family/marital variable was rather weakly associated with the majority of recidivism variables, and Strengths variable was not significantly associated with the recidivism variables.

Tables F2 and F3 feature correlation matrices of the association between the same set of recidivism variables and 20 LSI-OR variables for the subgroups of young offenders selected by location. Table F2 is for the custody and Table F3 for the community offenders. For these subgroups, the areas of high and weak associations were discussed in the Result section, titled Correlations between LSI-OR and recidivism.

Table F1

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154)

LSI-OR variables	General	Nonviolent	Violent	No.	No.
	recidivism ¹	recidivism ¹	recidivism ¹	charges	nonviolent charges
Static Factor (1)	.443 ^{***}	.421 ^{***}	.232 ^{**}	.426 ^{***}	.412 ^{***}
Dynamic Factor (2)	.374 ^{***}	.360 ^{***}	.244 ^{**}	.325 ^{***}	.311 ^{***}
General risk/need (A)	.460 ^{***}	.426 ^{***}	.307 ^{***}	.424 ^{***}	.406 ^{***}
Specific risk/need (B)	.239 ^{**}	.193 [*]	.283 ^{***}	.186 [*]	.150
Initial risk level (D1)	.453 ^{***}	.412 ^{***}	.280 ^{***}	.404 ^{***}	.395 ^{***}
Final risk level (D2)	.386 ^{***}	.368 ^{***}	.233 ^{**}	.372 ^{***}	.366 ^{***}
Total strengths (D3)	-.039	-.052	-.051	-.089	-.075
Criminal history (A1)	.434 ^{***}	.409 ^{***}	.259 ^{**}	.418 ^{***}	.391 ^{***}
Education/employ. (A2)	.325 ^{***}	.277 ^{**}	.292 ^{***}	.277 ^{**}	.246 ^{**}
Family/marital (A3)	.188 [*]	.205 [*]	.045	.138	.140
Leisure/recreation (A4)	.335 ^{***}	.347 ^{***}	.124	.301 ^{***}	.313 ^{***}
Companions (A5)	.242 ^{**}	.212 ^{**}	.175 [*]	.243 ^{**}	.252 ^{**}

Table F1 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154)

LSI-OR variables	General	Nonviolent	Violent	No.	No.
	recidivism ¹	recidivism ¹	recidivism ¹	charges	nonviolent charges
Procriminal attitudes (A6)	.240**	.243**	.239**	.203*	.185*
Substance abuse (A7)	.230**	.208*	.133	.219**	.222**
Antisocial pattern (A8)	.309***	.267**	.202*	.298***	.294***
Personal problems (B1)	.243**	.202*	.310***	.194*	.147
History of perpetr. (B2)	.113	.081	.090	.078	.081
Institutional factors (C)	.045	-.038	.046	-.054	-.054
Other client issues (F)	.140	.161*	.054	.061	.034
Special responsivity (G)	.348***	.301***	.244**	.228**	.236**

Table F1 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154)

LSI-OR variables	No.				
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	MSO, total
Static Factor (1)	.239**	.430***	.415***	.209**	.439***
Dynamic Factor (2)	.193*	.301***	.291***	.143	.360***
General risk/need (A)	.253**	.406***	.388***	.212**	.442***
Specific risk/need (B)	.209**	.184*	.142	.246**	.227**
Initial risk level (D1)	.211**	.382***	.369***	.185*	.423***
Final risk level (D2)	.188*	.358***	.348***	.164*	.370***
Total strengths (D3)	-.087	-.070	-.054	-.091	-.022
Criminal history (A1)	.280***	.416***	.392***	.245**	.430***
Education/employ. (A2)	.228**	.271**	.242**	.217**	.314***
Family/marital (A3)	.057	.139	.152	-.009	.151
Leisure/recreation (A4)	.093	.277**	.288***	.045	.328***
Companions (A5)	.080	.237**	.242**	.059	.238**

Table F1 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154.

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
Procriminal attitudes (A6)	.154	.157	.122	.209**	.244**
Substance abuse (A7)	.090	.209**	.215**	.045	.210**
Antisocial pattern (A8)	.150	.267**	.264**	.102	.287***
Personal problems (B1)	.249**	.173*	.125	.269**	.236**
History of perpetr. (B2)	.027	.113	.104	.078	.098
Institutional factors (C)	-.023	-.044	-.047	-.002	.036
Other client issues (F)	.119	.041	.027	.074	.134
Special responsivity (G)	.077	.223**	.208*	.142	.336***

Table F1 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154)

LSI-OR variables	No. convict. types	No. recidivism sets	No. breaches	No. fines	No. suspended sentenc
Static Factor (1)	.443 ^{***}	.464 ^{***}	.331 ^{***}	.151	.066
Dynamic Factor (2)	.337 ^{***}	.384 ^{***}	.301 ^{***}	.274 ^{**}	.083
General risk/need (A)	.435 ^{***}	.489 ^{***}	.367 ^{***}	.230 ^{**}	.063
Specific risk/need (B)	.201 [*]	.233 ^{**}	.133	.088	-.005
Initial risk level (D1)	.404 ^{***}	.444 ^{***}	.357 ^{***}	.206 [*]	.036
Final risk level (D2)	.364 ^{***}	.398 ^{***}	.330 ^{***}	.191 [*]	-.004
Total strengths (D3)	-.091	-.143	-.089	-.151	-.067
Criminal history (A1)	.431 ^{***}	.438 ^{***}	.325 ^{***}	.087	.063
Education/employ. (A2)	.293 ^{***}	.298 ^{***}	.306 ^{***}	.231 ^{**}	.017
Family/marital (A3)	.196 [*]	.227 ^{**}	.124	.087	-.143
Leisure/recreation (A4)	.333 ^{***}	.286 ^{***}	.279 ^{***}	.201 [*]	.074
Companions (A5)	.229 ^{**}	.306 ^{***}	.180 [*]	.131	.219 ^{**}

Table F1 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154)

LSI-OR variables	No. convict. types	No. recidivism sets	No. breaches	No. fines	No. suspended sentenc
Procriminal attitudes (A6)	.216**	.261**	.173*	.205*	.118
Substance abuse (A7)	.195*	.292***	.178*	.184*	.029
Antisocial pattern (A8)	.293***	.366***	.253**	.088	-.002
Personal problems (B1)	.222**	.222**	.134	.123	.030
History of perpetr. (B2)	.061	.139	.067	-.025	-.073
Institutional factors (C)	-.010	-.018	-.059	.051	-.039
Other client issues (F)	.112	.099	.062	-.019	-.097
Special responsivity (G)	.232**	.333***	.232**	.206*	.015

Table F1 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154)

LSI-OR variables	No. condition. sentence.	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
Static Factor (1)	.008	.219**	.166*	.363***	.192*
Dynamic Factor (2)	.029	.159*	.279***	.247**	.204*
General risk/need (A)	.051	.215**	.285***	.351***	.202*
Specific risk/need (B)	.039	.074	.117	.250**	.131
Initial risk level (D1)	.023	.215**	.273**	.344***	.225**
Final risk level (D2)	-.053	.183*	.240**	.324***	.156
Total strengths (D3)	-.017	-.122	-.014	-.081	-.065
Criminal history (A1)	.023	.224**	.172*	.377***	.192*
Education/employ. (A2)	.172*	.126	.197*	.151	.148
Family/marital (A3)	-.069	.039	.127	.148	-.056
Leisure/recreation (A4)	-.041	.131	.298***	.220**	.198*
Companions (A5)	-.021	.101	.196*	.153	.267**

Table F1 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Total Sample (n=154)

LSI-OR variables	No. condition. sentence.	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
Procriminal attitudes (A6)	.089	.107	.261**	.244**	.180*
Substance abuse (A7)	-.038	.127	.124	.174*	.060
Antisocial pattern (A8)	.044	.173*	.250**	.300***	.090
Personal problems (B1)	.049	.111	.166*	.228**	.129
History of perpetr. (B2)	.000	-.037	-.036	.171*	.071
Institutional factors (C)	-.016	-.043	-.047	-.034	-.053
Other client issues (F)	-.008	.030	.124	.148	-.041
Special responsivity (G)	.047	.058	.199*	.273**	.202*

Note. ¹ yes-no. ² length in days. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table F2

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	General	Nonviolent	Violent	No.	No.
	recidivism ¹	recidivism ¹	recidivism ¹	charges	nonviolent charges
Dynamic Factor (1)	.038	.155	.115	.146	.106
Static Factor (2)	.323*	.348	.171	.379**	.352**
General risk/need (A)	.157	.246	.189	.302*	.257
Specific risk/need (B)	-.133	-.132	.209	-.089	-.127
Initial risk level (D1)	.174	.244	.162	.321*	.294*
Final risk level (D2)	.155	.287*	.049	.337*	.317*
Total strengths (D3)	-.033	-.087	-.039	-.156	-.140
Criminal history (A1)	.309*	.341**	.177	.343**	.306*
Education/employ. (A2)	.046	.088	.122	.117	.083
Family/marital (A3)	.150	.228	-.060	.103	.107
Leisure/recreation (A4)	-.008	.161	-.119	.196	.186
Companions (A5)	.180	.204	.184	.316	.314*

Table F2 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	General	Nonviolent	Violent	No.	No.
	recidivism ¹	recidivism ¹	recidivism ¹	charges	nonviolent charges
Procriminal attitudes (A6)	.097	.130	.244	.037	-.006
Substance abuse (A7)	-.058	-.004	.113	.102	.075
Antisocial pattern (A8)	-.086	-.047	-.014	.092	.078
Personal problems (B1)	-.211	-.190	.195	-.129	-.172
History of perpetr. (B2)	.069	.037	.113	.026	.019
Institutional factors (C)	.114	-.076	.093	-.1	-.098
Other client issues (F)	.204	.241	.151	.023	-.04
Special responsivity (G)	.111	.134	.031	.028	.051

Table F2 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
Dynamic Factor (1)	.217	.094	.077	.109	.041
Static Factor (2)	.256	.410**	.389**	.220	.304*
General risk/need (A)	.302*	.273*	.247	.206	.153
Specific risk/need (B)	.120	-.088	-.139	.214	-.111
Initial risk level (D1)	.231	.291*	.270*	.184	.144
Final risk level (D2)	.212	.328*	.320*	.137	.183
Total strengths (D3)	-.124	-.155	-.140	-.119	-.023
Criminal history (A1)	.285*	.373**	.344**	.251	.297*
Education/employ. (A2)	.183	.111	.092	.123	.04
Family/marital (A3)	.022	.076	.113	-.149	.088
Leisure/recreation (A4)	.118	.139	.154	-.029	.062
Companions (A5)	.133	.306*	.309*	.081	.217

Table F2 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
Procriminal attitudes (A6)	.190	-.011	-.079	.316*	.124
Substance abuse (A7)	.152	.070	.061	.062	-.078
Antisocial pattern (A8)	.093	.048	.047	.020	-.096
Personal problems (B1)	.127	-.154	-.205	.193	-.159
History of perpetr. (B2)	.040	.068	.046	.127	.029
Institutional factors (C)	-.046	-.085	-.090	-.002	.090
Other client issues (F)	.264	-.014	-.048	.159	.227
Special responsivity (G)	-.085	.046	.031	.082	.097

Table F2 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	No. convict. types	No. recidivism sets	No. breaches	No. fines	No. suspended sentenc
Dynamic Factor (1)	.143	.166	.093	.325*	.280*
Static Factor (2)	.374**	.415**	.353**	.144	-.023
General risk/need (A)	.310*	.360**	.255	.357**	.168
Specific risk/need (B)	-.082	-.034	-.127	-.059	.117
Initial risk level (D1)	.275*	.340*	.272*	.331*	.095
Final risk level (D2)	.267*	.355**	.308*	.282*	.068
Total strengths (D3)	-.155	-.221	-.229	-.185	-.106
Criminal history (A1)	.355**	.387**	.328*	.135	-.023
Education/employ. (A2)	.143	.158	.148	.327*	.096
Family/marital (A3)	.233	.171	.105	.304*	-.160
Leisure/recreation (A4)	.181	.100	.108	.157	.082
Companions (A5)	.241	.349**	.244	.222	.358**

Table F2 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	No. convict. types	No. recidivism sets	No. breaches	No. fines	No. suspended sentenc
Procriminal attitudes (A6)	.054	.092	.045	.235	.327*
Substance abuse (A7)	.084	.124	.031	.151	.168
Antisocial pattern (A8)	.061	.155	.039	.121	.005
Personal problems (B1)	-.115	-.093	-.175	-.014	.202
History of perpetr. (B2)	.018	.081	.024	-.100	-.087
Institutional factors (C)	-.021	-.037	-.111	.090	-.056
Other client issues (F)	.135	.063	.115	.010	-.006
Special responsivity (G)	-.026	.142	.059	.204	.035

Table F2 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	No. condition. sentence.	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
Dynamic Factor (1)	-.055	.098	.312	.007	.152
Static Factor (2)	-.136	.224	-.081	.24	.096
General risk/need (A)	-.052	.216	.172	.101	.141
Specific risk/need (B)	-.025	-.090	.003	.035	.078
Initial risk level (D1)	-.134	.227	.159	.133	.179
Final risk level (D2)	-.283*	.189	.147	.164	.091
Total strengths (D3)	-.040	-.155	.080	-.112	-.054
Criminal history (A1)	-.123	.186	-.067	.258	.063
Education/employ. (A2)	.262*	.070	.103	-.067	.087
Family/marital (A3)	-.186	.097	.166	-.068	-.078
Leisure/recreation (A4)	-.116	.156	.313*	.089	.075
Companions (A5)	-.094	.179	.206	.075	.352**

Table F2 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Custody Group (n=57)

LSI-OR variables	No. condition. sentence.	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
Procriminal attitudes (A6)	.074	.054	.111	.071	.287*
Substance abuse (A7)	-.167	.075	.184	-	-.027
Antisocial pattern (A8)	-.027	.199	-.017	-.006	.024
Personal problems (B1)	.003	-.041	.014	-.065	.013
History of perpetr. (B2)	-.056	-.119	-.015	.177	.139
Institutional factors (C)	-.036	-.069	-.082	-.069	-.08
Other client issues (F)	-.061	-.020	.262*	.162	-.035
Special responsivity (G)	.023	-.072	.031	.098	.153

Note. ¹ yes/no. ² length in days. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table F3

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	General	Nonviolent	Violent	No.	No.
	recidivism ¹	recidivism ¹	recidivism ¹	charges	nonviolent charges
Dynamic Factor (1)	.393 ^{***}	.325 ^{**}	.267 ^{**}	.337 ^{**}	.361 ^{***}
Static Factor (2)	.318 ^{**}	.273 ^{**}	.188	.297 ^{**}	.303 ^{**}
General risk/need (A)	.438 ^{***}	.352 ^{***}	.328 ^{**}	.388 ^{***}	.404 ^{***}
Specific risk/need (B)	.273 ^{**}	.213 [*]	.280 ^{**}	.267 ^{**}	.244 [*]
Initial risk level (D1)	.403 ^{***}	.326 ^{**}	.291 ^{**}	.349 ^{***}	.367 ^{**}
Final risk level (D2)	.318 ^{**}	.251 [*]	.267 ^{**}	.281 ^{**}	.296 ^{**}
Total strengths (D3)	-.143	-.108	-.112	-.068	-.046
Criminal history (A1)	.298 ^{**}	.244 [*]	.241 [*]	.312 ^{**}	.296 ^{**}
Education/employ. (A2)	.390 ^{***}	.301 ^{**}	.374 ^{**}	.345 ^{**}	.327 ^{**}
Family/marital (A3)	.108	.101	.060	.069	.073
Leisure/recreation (A4)	.453 ^{***}	.396 ^{***}	.252 [*]	.346 ^{**}	.394 ^{***}
Companions (A5)	.173	.112	.116	.076	.096

Table F3 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	General	Nonviolent	Violent	No.	No.
	recidivism ¹	recidivism ¹	recidivism ¹	charges	nonviolent charges
Procriminal attitudes (A6)	.215*	.207*	.177	.261*	.287**
Substance abuse (A7)	.209*	.158	.067	.160	.204*
Antisocial pattern (A8)	.360***	.282**	.291**	.330**	.355**
Personal problems (B1)	.338**	.277**	.344**	.336**	.298**
History of perpetr. (B2)	-.008	-.039	-.004	-.021	-.001
Institutional factors (C)	-.078	-.073	-.044	-.054	-.053
Other client issues (F)	.020	.034	-.058	-.002	.002
Special responsivity (G)	.420***	.329**	.380***	.341**	.350***

Table F3 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
Dynamic Factor (1)	.099	.323**	.327**	.088	.377***
Static Factor (2)	.126	.261**	.257*	.101	.332**
General risk/need (A)	.144	.360***	.355**	.137	.419***
Specific risk/need (B)	.192	.255*	.222*	.210*	.251*
Initial risk level (D1)	.121	.312**	.309**	.112	.374***
Final risk level (D2)	.096	.252*	.246*	.104	.289**
Total strengths (D3)	-.094	-.016	.009	-.096	-.110
Criminal history (A1)	.192	.263**	.243*	.159	.307**
Education/employ. (A2)	.215*	.338**	.301**	.248*	.381***
Family/marital (A3)	.023	.089	.089	.030	.082
Leisure/recreation (A4)	.040	.346**	.360***	.058	.412***
Companions (A5)	-.016	.066	.077	-.018	.149

Table F3 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	No.				MSO, total
	No. violent charges	No. convictions	nonviolent convict.	No. violent convict.	
Procriminal attitudes (A6)	.057	.205*	.211*	.044	.209*
Substance abuse (A7)	-.039	.161	.190	-.059	.194
Antisocial pattern (A8)	.094	.295**	.301**	.072	.337**
Personal problems (B1)	.263**	.310**	.264**	.275**	.308**
History of perpetr. (B2)	-.064	.004	.016	-.042	-.002
Institutional factors (C)	-.030	-.054	-.050	-.033	-.076
Other client issues (F)	-.012	-.017	-.011	-.030	-.002
Special responsivity (G)	.139	.309**	.297**	.145	.412***

Table F3 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	No. convict. types	No. recidivism sets	No. breaches	No. fines	No. suspended sentence.
Dynamic Factor (1)	.327**	.433***	.329**	.192	-.052
Static Factor (2)	.322**	.343**	.160	.051	.121
General risk/need (A)	.371***	.472***	.324**	.084	-.015
Specific risk/need (B)	.247*	.305**	.184	.122	-.112
Initial risk level (D1)	.340**	.407***	.302**	.087	-.010
Final risk level (D2)	.281**	.312**	.243*	.084	-.065
Total strengths (D3)	-.098	-.121	.032	-.151	-.029
Criminal history (A1)	.307**	.305**	.167	-.089	.112
Education/employ. (A2)	.327**	.347**	.355***	.139	-.041
Family/marital (A3)	.082	.188	.060	-.100	-.152
Leisure/recreation (A4)	.390***	.389***	.348***	.205*	.062
Companions (A5)	.116	.176	.050	.013	.117

Table F3 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	No. convict. types	No. recidivism sets	No. breaches	No. fines	No. suspended sentence.
Procriminal attitudes (A6)	.242 [*]	.323 ^{**}	.188	.122	-.078
Substance abuse (A7)	.107	.286 ^{**}	.152	.146	-.082
Antisocial pattern (A8)	.305 ^{**}	.410 ^{***}	.284 ^{**}	-.029	-.032
Personal problems (B1)	.327 ^{**}	.349 ^{***}	.231 [*]	.161	-.099
History of perpetr. (B2)	-.055	.052	-.011	-.026	-.083
Institutional factors (C)	-.064	-.061	-.049	-.027	-.027
Other client issues (F)	.007	.036	-.044	-.084	-.170
Special responsivity (G)	.358 ^{***}	.444 ^{***}	.300 ^{**}	.165	-.013

Table F3 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	No. condition. sentence.	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
Dynamic Factor (1)	-	.149	.241 [*]	.334 ^{**}	.162
Static Factor (2)	-	.128	.302 ^{**}	.352 ^{***}	.152
General risk/need (A)	-	.152	.342 ^{**}	.448 ^{***}	.144
Specific risk/need (B)	-	.158	.149	.338 ^{**}	.083
Initial risk level (D1)	-	.169	.319 ^{**}	.397 ^{***}	.178
Final risk level (D2)	-	.126	.266 ^{**}	.346 ^{**}	.102
Total strengths (D3)	-	-.099	-.157	-.103	-.135
Criminal history (A1)	-	.189	.298 ^{**}	.368 ^{***}	.175
Education/employ. (A2)	-	.146	.230 [*]	.269 ^{**}	.152
Family/marital (A3)	-	-.070	.080	.256 [*]	-.115
Leisure/recreation (A4)	-	.080	.275 ^{**}	.290 ^{**}	.265 ^{**}
Companions (A5)	-	-.040	.163	.138	.141

Table F3 (continued)

Pearson Correlations Between LSI-OR and Recidivism Variables for Community Group (n=97)

LSI-OR variables	No. condition. sentence.	No. withdrawn charges	No. outstand. charges	Sentence length custody ²	Sentence length probat. ²
Procriminal attitudes (A6)	-	.108	.362***	.352***	-.017
Substance abuse (A7)	-	.105	.046	.198	.025
Antisocial pattern (A8)	-	.063	.409***	.484***	.029
Personal problems (B1)	-	.199	.228*	.393***	.145
History of perpetr. (B2)	-	-.013	-.102	.045	-.096
Institutional factors (C)	-	-.028	-.028	-.034	-.051
Other client issues (F)	-	.033	.017	.072	-.108
Special responsivity (G)	-	.158	.300**	.392***	.196

Note. ¹ yes/no. ² length in days. * $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix G. The variables of the current study

CLIENT VARIABLES

CLIENTID	OMS no
GENDER	Client's gender M/F
DOB	Client's date of birth
CONTEXT	Context for LSIOR
FACILITY	Facility completing LSIOR (OMS code)
AGE	Client's age at first LSIOR
AGE_IND	Client's age at PADMDATE
RACE	Client's race
RACEVALU	Client's race W/O
NATVSTAT	Client's native status
LASTGRAD	Last grade completed
PSYCH	Suicide/mental health Y/N

INDEX OFFENCE ADMISSION VARIABLES

ADMITYPE	Type of legal document
	Value Label
	0 PRO
	1 PFI
	2 OPN
	3 SEC
ADMLOCAT	Admit location (OMS code)
LCONTRES	Open custody residence location code (OMS code)
LOCATION	Disposition type COM/CUST
OCFS	Open custody to follow secure Y/N
PROFI	Probation to follow Y/N

INDEX SENTENCE VARIABLES

PADMDATE	Order start date (yyyymmdd)
PDEPDATE	Order end date (yyyymmdd)
ORDLGTH	Length of order
MSO1	Most serious offence (OMS code)
MSO1VALU	Offence weight
	Value Label
	1 Unknown
	2 Municipal bylaw
	3 Other provincial
	4 Liquor license act
	5 Highway traffic act
	6 Parole violations
	7 Other federal statute
	8 Misc. against public order
	9 Drinking driving

	10	Breach of court order/escape
	11	Criminal code traffic
	12	Drug possession
	13	Obstruction of justice
	14	Morals & gaming
	15	Arson/Property damage
	16	Assault
	17	Theft/Possession
	18	Misc. against person
	19	Fraud
	20	Weapons
	21	Traffic/Import drugs
	22	Nonviolent sexual
	23	Break & enter
	24	Violent sexual
	25	Serious violent
	26	Homicide
NONVICH1		Index nonviolent offence Y/N
VICHGSYN		Index violent offence Yes/No
VICHGS		Number of violent charges
NONVICH		Number of non-violent charges
CHARG		Number of charges total
VIOL_SER		Index violent offence - seriousness
	Value	Label
	0	Non violent
	1	Violent
	2	Extreme violent

LSI-OR VARIABLES

A1.1	Any prior young or adult dispositions Y/N
A1.1NUMY	Prior youth dispositions
A1.1NUMA	Prior adult dispositions
A1.1TOT	Any prior youth/adult dispositions
A1.2	Two or more prior adult/youth dispositions Y/N
A1.3	Three or more prior adult/youth dispositions Y/N
A1.4	Three or more present offences Y/N
A1.4NUM	Three or more present offences: Number
A1.5	Arrested or charged under age 16 Y/N
A1.6	Ever incarcerated upon adjudication Y/N
A1.7	Ever punished for institutional misconduct/behaviour report Y/N
A1.7NUM	Ever punished for institutional misconduct: Number
A1.8	Charges laid, probation breached or parole suspended Y/N
A1.SUBT	Criminal History: Subtotal
A1.STRN	Criminal History: Strength
A2.9	Currently unemployed Y/N
A2.10	Frequently unemployed Y/N

A2.11	Never employed for full year Y/N
A2.12	Less than grade 10 or equivalent Y/N
A2.13	Less than regular grade 12 or equivalent Y/N
A2.14	Suspended or expelled at least once Y/N
A2.15	Participation/Performance Y/N
A2.15R	Participation/Performance: Rating
	Value Label
	0 Lowest level
	1 Low
	2 Moderate
	3 Highest level
	4 Not rated
A2.16	Peer Interactions: Rating
A2.16R	Peer Interactions: Rating
	Value Label
	0 Lowest level
	1 Low
	2 Moderate
	3 Highest level
	4 Not rated
A2.17	Authority interactions
	Value Label
	0 Lowest level
	1 Low
	2 Moderate
	3 Highest level
	4 Not rated
A2.SUBT	Education/Employment: Subtotal
A2.STRN	Education/Employment: Strength
A3.18	Dissatisfaction with marital or equivalent Y/N
A3.18R	Rating: Dissatisfaction with marital or equiv. situation
	Value Label
	0 Lowest level
	1 Low
	2 Moderate
	3 Highest level
	4 Not rated
A3.19	Nonrewarding, parental Y/N
A3.19R	Nonrewarding, parental: Rating
	Value Label
	0 Lowest level
	1 Low
	2 Moderate
	3 Highest level
	4 Not rated

A3.20	Nonrewarding, other relatives Y/N
A3.20R	Nonrewarding, other relatives: Rating
	Value Label
	0 Lowest level
	1 Low
	2 Moderate
	3 Highest level
	4 Not rated
A3.21	Criminal-Family/Spouse Y/N
A3.SUBT	Family/Marital: Subtotal
A3.STRN	Family/Marital: Strength
A4.22	No recent participation in an organized activity Y/N
A4.23	Could make better use of time Y/N
A4.23R	Could make better use of time: Rating
	Value Label
	0 Lowest
	1 Low
	2 Moderate
	3 Highest
	4 Not rated
A4.SUBT	Leisure/Recreation: Subtotal
A4.STRN	Leisure/Recreation: Strength
A5.24	Some criminal acquaintances Y/N
A5.25	Some criminal friends Y/N
A5.26	No anti-criminal acquaintances Y/N
A5.27	No anti-criminal friends Y/N
A5.27NUM	No anti-criminal friends: number
A5.SUBT	Companions: Subtotal
A5.STRN	Companions: Strengths
A6.28	Supportive of crime Y/N
A6.28R	Supportive of crime: Rating
	Value Label
	0 Lowest
	1 Low
	2 Moderate
	3 Highest
	4 Not rated
A6.29	Unfavorable toward convention Y/N
A6.29R	Unfavorable toward convention: Rating
	Value Label
	0 Lowest
	1 Low
	2 Moderate
	3 Highest
	4 Not rated

A6.30	Poor toward sentence/offence Y/N
A6.31	Poor toward supervision/treatment Y/N
A6.SUBT	Procriminal attitude/Orientation: Subtotal
A6.STRN	Procriminal Attitude/Orientation: Strength
A7.32	Alcohol problem, ever Y/N
A7.33	Drug problem, ever Y/N
A7.34	Alcohol problem, currently Y/N
A7.34R	Alcohol problem, currently: Rating
	Value Label
	0 Lowest
	1 Low
	2 Moderate
	3 Highest
	4 Not rated
A7.35	Drug problem, currently Y/N
A7.35R	Drug Problem, currently: Rating
	Value Label
	0 Lowest
	1 Low
	2 Moderate
	3 Highest
	4 Not rated
A7.36	Law violations Y/N
A7.37	Marital/Family Y/N
A7.38	School/Work Y/N
A7.39	Medical or other clinical indicators Y/N
A7.SUBT	Substance Abuse: Subtotal
A7.STRN	Substance Abuse: Strength
A8.40	Specialized assessment for Antisocial pattern Y/N
A8.41	Early and diverse antisocial behaviour Y/N
A8.41I5	Arrested under age 16 (Item 5)
A8.41A	Official record of assault/violence
A8.41B	Escape history
A8.41C	Charge laid, probation breached or parole suspended during probation
A8.42	Criminal Attitude Y/N
A8.42I28	Criminal Attitude: Item 28
A8.42I29	Criminal Attitude: Item 29
A8.42I31	Criminal Attitude: Item 31
A8.43	Pattern of generalized trouble Y/N
A8.43FP	Generalized trouble: Financial Problems
A8.43AC	Generalized trouble: Address change
A8.43I11	Generalized trouble: Item 11
A8.43I12	Generalized trouble: Item 12
A8.43I14	Generalized trouble: Item 14
A8.43I19	Generalized trouble: Item 19

A8.43I23	Generalized trouble: Item 23
A8.43I27	Generalized trouble: Item 27
A8.SUBT	Antisocial Pattern: Subtotal
A8.STRN	Antisocial Pattern: Strength
B1.1	Clear problems of compliance Y/N
B1.2	Diagnosis of psychopathy Y/N
B1.3	Diagnosis of other personality disorder Y/N
B1.4	Threat from third party Y/N
B1.5	Problem-solving/self-management, skill deficits Y/N
B1.6	Anger management deficits Y/N
B1.7	Intimidating/controlling Y/N
B1.8	Inappropriate sexual activity Y/N
B1.9	Poor social skills Y/N
B1.10	Peers outside age range Y/N
B1.11	Racist/sexist behavior Y/N
B1.12	Underachievement Y/N
B1.13	Outstanding charges Y/N
B1.14	Other Y/N
B1.TOT	Personal Problem: Subtotal
B2.1	Sexual assault (extrafamilial) Y/N
B2.2	Sexual assault (interfamilial) Y/N
B2.3	Physical assault (extrafamilial) Y/N
B2.4	Physical assault (interfamilial) Y/N
B2.5	Assault on an authority figure Y/N
B2.6	Weapon use Y/N
B2.7	Fire setting Y/N
B2.8	Escapes/U.A.L. Y/N
B2.9	Impaired Driving Y/N
B2.TOT	History of Perpetration: Subtotal
B.TOT	Specific Risk/Need Factors: Total
C1	Last classification maximum Y/N
C2	Last classification medium Y/N
C3	Last classification minimum Y/N
C4	Protective custody Y/N
C5	Treatment recommended/ordered Y/N
C6	Misconduct/Behaviour report current incarceration Y/N
C6NUM	Misconduct/Behaviour report current incarceration: Number
C7	Administrative segregation Y/N
C8	Security management concerns Y/N
C9	Past federal penitentiary Y/N
C.TOT	Prison Experience: Subtotal
D.LSI	Total LSI-OR Score: (A)
D.STRN	Total Strengths (A)
D.RNF	Specific risk/need factors (B)
D.POS	Summary of strengths: Positive-section (A)

	Value	Label
	0	No positives indicated
	1	Positives indicated
	2	ResponseItem2
A.TOT	Total of (A)	
E.FRL	LSI Final Risk Level_5 levels, from LSI-OR	
	Value	Label
	0	Very Low
	1	Low
	2	Medium
	3	High
	4	Very High
E.IRLC	Initial Risk Level: calculated based on a.tot	
	Value	Label
	0	Very Low
	1	Low
	2	Medium
	3	High
	4	Very High
E_DIFFER	Difference between e.irlc (Initial Risk calc. a.tot) & e.frl	
E_INRSK3	Initial Risk 4 levels: 1, 2, 3, & 4 (levels 3 & 4 merged)	
E_INRSK3	Initial Risk 3 levels: 1, 2, & 3 (levels 0 and 1 merged & 3"	
E.OVRRD	Override Y/N	
F1.1	Financial problems Y/N	
F1.	Accommodation problems Y/N	
F1.4	Health problems Y/N	
F1.5	Depressed Y/N	
F1.6	Physical disability Y/N	
F1.7	Low self-esteem Y/N	
F1.8	Shy/withdrawn Y/N	
F1.9	Diagnosis of psychosis Y/N	
F1.10	Suicide attempts/threats Y/N	
F1.11	Learning disability Y/N	
F1.12	Other evidence of emotional distress Y/N	
F1.13	Immigration issues Y/N	
F1.14	Victim: family violence Y/N	
F1.15	Victim: physical assault Y/N	
F1.16	Victim: sexual assault Y/N	
F1.17	Victim: emotional abuse Y/N	
F1.18	Victim of neglect Y/N	
F1.19	Other Y/N	
F1.TOT	Social, health and mental health: total	
F2.1	Community supervision inappropriate Y/N	
F.TOT	Other client issues: total	
G1	Motivation as a barrier Y/N	

G2	Engages in denial/minimize Y/N
G3	Interpersonally anxious Y/N
G4	Cultural issues Y/N
G5	Ethnicity issues Y/N
G6	Low intelligence Y/N
G7	Communication barriers Y/N
G8	Other special responsivity considerations Y/N
G.TOT	Total other special responsivity considerations
H.TYPE	Total other special responsivity considerations
	Value Label
	0 Not checked
	1 Institution, Secure/Open Custody
	2 Release Recommendation
	3 Community
H.RECOM	Recommendation/Decision
	Value Label
	0 No
	1 Yes
	2 Minimum
	3 Medium/Moderate
	4 Maximum

SECOND LSI-OR ADMINISTRATION

LSIORDAT	LSI-OR Date
A1.SUBT2	Criminal History: Subtotal 2
A2.SUBT2	Education/Employment Subtotal 2
A2.STRN2	Education/Employment Strength 2
A3.SUBT2	Family/marital: Subtotal 2
A3.STRN2	Family/Marital: Strength 2
A4.SUBT2	Leisure/Recreation: Subtotal 2
A4.STRN2	Leisure/Recreation: Strength 2
A5.SUBT2	Companions: Subtotal 2
A5.STRN2	Companions: Strengths 2
A6.SUBT2	Procriminal Attitude/Orientation: Subtot2
A6.STRN2	Procriminal Attitude/Orientation: Strength 2
A7.SUBT2	Substance Abuse: Subtotal 2
A7.STRN2	Substance Abuse: Strength 2
A8.SUBT2	Antisocial Pattern: subtotal 2
A8.STR2	Antisocial Pattern: Strength 2
A.TOT2	Total (A) - 2
B1.TOT2	Personal Problems: Subtotal 2
B2.TOT2	History of Perpetration: Subtotal 2
B.TOT2	Specific Risk/Need Factors: Total 2
C.TOT2	Prison Experience: Subtotal 2
D.LSI2	Total LSI-OR Score: (A) 2
D.RNF2	Specific risk/need factors (B) 2

D.STRN2	Total Strengths (A) 2
F1.TOT2	Social, health and mental health: total 2
F2.1_2	Community supervision inappropriate 2 Y/N
F.TOT2	Other client issues: total 2
G.TOT2	Total other special responsivity considerations 2
A1.STRN2	Criminal History: Strength 2
E.FRL2	Final Risk Level: from LSI-OR 2
	Value Label
	0 Very Low
	1 Low
	2 Medium
	3 High
	4 Very High
E.IRLC2	Initial Risk Level
	Value Label
	0 Very Low
	1 Low
	2 Medium
	3 High
	4 Very High
E.FRLC2	Final Risk Level
	Value Label
	0 Very Low
	1 Low
	2 Medium
	3 High
	4 Very High
E.OVRRD2	Override 2 Y/N
LSIORDA2	LSI-OR Date 2
ITI	Intertest Interval between LSIORs - days
ITI_6MO	Intertest Interval four 6mos periods
ITI_1234	Intertest Intervals (1,2) and (3,4) pooled into 2 groups

RECIDIVISM VARIABLES

NEWADMIT	New admission date
LEGALDOC	Legal document
	Value Label
	1 Warrant of committal alone
	2 Probation order alone
	3 Woc with probation to follow
	4 Conditional sentence
	5 Conditional sentence with probation to follow
LAPSCOM	Laps time Community - newadm-lsiordate
LAPSCUST	Laps time Custody - newadm-pdeptime
LAPSETIM	Lapse Time Tot. Sample (Lapsetcom +Lapscust)
RECIDIV	Recidivism status Y/N

VIOLSTAT	Violence status Y/N
NVIOLSTA	Nonviolence status Y/No convictions
R3CONVTO	Total number of convictions
R3CHATOT	Total number of charges
R3VIOLEN	Total number of violent convictions
R3VCHTOT	Total number of violent charges
R3NVIOCO	Total # of nonviolent convictions (r3charg-r3violen)
R3NVIOCH	Total # of nonviolent charges (r3chatot - r3vchtot)
R3MSOTOT	Most serious offence total
R3MSOCON	Most serious conviction
	Value Label
	1 26. Unknown
	2 25. Municipal bylaw
	3 24. Other provincial
	4 23. Liquor license act
	5 22. Highway traffic act
	6 21. Parole violation
	7 20. Other federal statute
	8 19. Misc. against public order
	9 18. Drinking driving
	10 17. Breach of court order/escape
	11 16. Criminal code traffic
	12 15. Drug possession
	13 14. Obstruction of justice
	14 13. Morals and gaming
	15 12. Arson\property damage
	16 11. Assault and related
	17 10. Theft\possession
	18 9. Misc. against the person
	19 8. Fraud and related
	20 7. Weapons
	21 6. Traffic\Import drugs
	22 5. Nonviolent sexual
	23 4. Break and enter & related
	24 3. Violent sexual
	25 2. Serious violent
	26 1. Homicide and related
R3CHRTYP	Total number of charge types (Diversity)
R3CONTYP	Total number of conviction types (Diversity)
R3RCSETS	Total number of recidivism sets
R3BRETOT	Total number of breaches
R3BREACH	Total number of breach convictions
R3CUSTOD	Total sentence custody
R3PROBAT	Total sentence probation
R3FINE	Total number of fines

R3SUSPEN Total number of suspended sentences
 R3CONDIT Total number of conditional sentences
 R3INTERM Total number of intermittent sentences
 R3OUTSTA Total number of outstanding charges
 R3WITHDR Total number of withdrawn charges

TIME TO RECIDIVSM VARIABLES

TIMRISK1 Time to recidivism Custody Recidivists
 TIMRISK0 Time to recidivism Community Recidivists
 TIMRISKT Time to recidivism All Recidivists

FOLLOW-UP TIME VARIABLES

FALLUP Follow-Up date
 FALLTCOM (10-12-2001) Follow-up Time (CPIC's) minus Pdeupdate(Custody)

LSI-OR FACTOR ANALYSIS VARIABLES

FAC1_LSI Regression 1 factor score LSIOR Section A, Obligue rot
 FAC2_LSI Regression 2 factor score LSIOR Section A, Obligue rot

RECIDIVISM PRINCIPAL COMPONENTS ANALYSIS VARIABLES

FAC1_REC Regression 1 factor score originally derived Recidivism Factor
 FAC1_4LG Regression 1 factor score Log10(x +c) transform. Recidivism Factor
 FAC1_5RC Regression 1 factor score Reciprocal 1 over (x +c) transform. Recidivism Factor

SURVIVAL ANALYSES VARIABLES

SUR_1 Survival function
 SUR_2 Survival function
 SUR_3 Survival function
 SUR_4 Survival function
 SUR_5 Survival function
 SUR_6 Survival function

LOGISTIC REGRESSION MODELS PROBABILITY METRIC VARIABLES (for ROCs)

PRE_1 Predicted probability logistic regression 2 Factors on General Recidivism
 PRE_2 Predicted probability logistic regression Sect. ABCFG on General Recidivism
 PRE_3 Predicted probability logistic regression Subs. A1 to A8 on General Recidivism
 PRE_4 Predicted probability logistic regression Subs.A1 to A8 on Violent Recidivism
 PRE_5 Predicted probability logistic regression Sect. ABCFG on Violent Recidivism
 PRE_6 Predicted probability logistic regression 2 Factors on Violent Recidivism
 PRE_7 Predicted probability logistic regression 2 Factors on Nonviolent Recidivism.
 PRE_8 Predicted probability logistic regression Sect. ABCFG on Nonviolent Recidivism
 PRE_9 Predicted probability logistic regression Subs.A1 to A8 on General Recidivism
 PRE_10 Predicted probability logistic regression 2 Factors on General Recidivism-CUST
 PRE_11 Predicted probability logistic regression Sect. ABCFG on General Recidivism-CUST
 CUST

PRE_12 CUST	Predicted probability logistic regression Subs.A1 to A8 on General Recidivism-
PRE_13 COMM	Predicted probability logistic regression Subs.A1 to A8 on General Recidivism-
PRE_14 COMM	Predicted probability logistic regression Sect. ABCFG on General Recidivism-
PRE_15	Predicted probability logistic regression 2 Factors on General Recidivism-COMM
PRE_16 ABORIG	Predicted probability logistic regression 2 Factors on General Recidivism-
PRE_17 ABORIG	Predicted probability logistic regression Sect. ABCFG on A General Recidivism-
PRE_18 ABORIG	Predicted probability logistic regression Subs.A1 to A8 on General Recidivism-
PRE_19 NONABOR	Predicted probability logistic regression Subs.A1 to A8 on General Recidivism-
PRE_20 NONABOR	Predicted probability logistic regression Sect. ABCFG on General Recidivism-
PRE_21 NONABOR	Predicted probability logistic regression 2 Factors on General Recidivism-
PRE_22	Predicted probability logistic regression 2 Factors on General Recidivism-MALE
PRE_23 MALE	Predicted probability logistic regression Sect. ABCFG on General Recidivism-
PRE_24	Predicted probability logistic regression Subs.A1 to A8 on M General Recidivism-MALE
PRE_25 FEMALE	Predicted probability logistic regression Subs.A1 to A8 on General Recidivism-
PRE_26 EMALE	Predicted probability logistic regression Sect. ABCFG on F General Recidivism-
PRE_27 FEMALE	Predicted probability logistic regression 2 Factors on General Recidivism-

Appendix H. A Priori Power Analyses' Results

