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Prisoner Classification Re-visited: A Further Test of the Level of Service Inventory-Revised (LSI-R) Intake Assessment

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PRISONER CLASSIFICATION RE-VISITED:

A FURTHER TEST OF THE LEVEL OF SERVICE INVENTORY-REVISED (LSI-R)

INTAKE ASSESSMENT

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Philosophy

Hye-Sun Kim

Indiana University of Pennsylvania

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Indiana University of Pennsylvania
The School of Graduate Studies and Research
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Title: Prisoner Classification Re-visited:
          A Further Test of the Level of Service Inventory-Revised (LSI-R) Intake Assessment

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The classification system in corrections seeks to accurately predict inmates' future behaviors by utilizing risk assessment. Of actuarial risk assessment inventories, the Level of Service Inventory-Revised (LSI-R) has been widely utilized to classify offenders for treatment and prevention of re-offense. The LSI-R has been considered a 'gender-neutral and culture-responsive' risk assessment inventory. Even though multiple studies assert the validity of the LSI-R beyond gender and culture, there has been a concern that such research has been conducted predominantly with white male inmates. Recognizing such concern, the primary purpose of this study was to assess the validity of the LSI-R based on gender, offense type and race. The study also documented the historical scheme of the evolution of classification systems, the risk assessment inventories, and the theoretical underpinning of the LSI-R.

The study sample consisted of 12,975 male and female offenders who were released from the Pennsylvania Department of Corrections in 2004. The data were collected about the initial LSI-R score, the recidivism record for 36 month follow-up period, and other demographic characteristics. Nine hypotheses were tested by conducting a series of statistical analyses including two-way ANOVA and logistic regressions. Relationships tested include the impact of gender on LSI-R scores and

recidivism, and the impact of gender and offense type impact on LSI-R scores and recidivism. Also tested was the impact of race on LSI-R scores and recidivism.

Research findings supported the impact of gender on the LSI-R scores, but did not support the offense type impact or the interaction impact of gender and offense type on LSI-R scores. The results also supported the prediction that the LSI-R score was a reliable measure in forecasting recidivism for each racial group. However, the results called into a question about the predictability of the LSI-R subscales for the violent female offender group by failing identification of salient factors of such subscales. The findings of this dissertation suggest caution in using the LSI-R to predict recidivism for violent and nonviolent female offenders. This research has clear implications for development of gender-specific risk assessment tools and provides new empirical evidence for risk assessment practices.

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CHAPTER I

INTRODUCTION

Offender classification is of fundamental importance across the criminal justice

system. Classification affects basic decision-making in regard to offenders, including

security placements, supervision requirements, discretionary release and program

placements (Gobeil & Blanchette, 2007; D. M. Gottfredson, 1987; Motiuk, 1997). Since

the 1970's, corrections, in particular, has been impacted by philosophical and political

shifts from rehabilitation toward retribution (MacKenzie, 2001). Linked to the growth of

correctional populations, classification systems have changed fundamentally over the past

three decades by focusing on how to classify and manage inmates during incarceration in

order to reduce recidivism (Austin, 2003; Austin, Hardyman, & Brown, 2001).

Emerging classification systems have notably changed by embracing relevant

factors grounded in theory and empirical evidence of "correction." In particular, these

classification systems place an emphasis on risk assessment and the management of

correctional populations while incarcerated, so that rehabilitation programs can affect

changes in offenders' behaviors after release (MacKenzie, 2001). Rehabilitation is now

considered an imperative mission of corrections, such that, classification systems serve

an essential function affecting the efficiency of the entire criminal justice system (Bonta,

1996). Accurate classification can improve the effectiveness of correctional programs by

decreasing the possibility of offenders' misbehaviors either in the institution or the

community post release.

Classification systems mainly serve to determine the dangerousness of offenders

to others or themselves during confinement, while at the same time, predicting the

likelihood of reoffending after release (Champion, 1994; D. M. Gottfredson, 1987).

Functionally, risk- and need-based assessment has been recognized as a major classification system since the 1990's and, thus, it has been utilized across the correctional systems in the United States (Andrews, 2006; Andrews, Bonta, & Wormith, 2006; Bonta, 1996; Buchlen, 2001; Gottfredson & Moriarty; 2006; Kroner & Mills, 2001). Risk-need assessment evaluates previous criminal history by utilizing both static and dynamic factors that are believed to determine the possibility of reoffending (Andrews & Bonta, 2003). Accordingly, risk-need assessment is a crucial procedure from an offender's reception into the prison system to his or her release (Gottfredson & Moriarty, 2006; Krone & Mills, 2001).

With the recognition of the importance of risk assessment in the correctional system, risk assessment tools have expanded their categories into sociological as well as psychological factors (Andrews & Bonta, 2003). This expansion has led to the development of new theoretical and evidenced-based risk classification systems by introducing new risk assessment tools. Since the 1960s, there have been two types of risk assessment tools recognized in literature – clinical and actuarial [statistical] (Andrews & Bonta, 2003; Bonta, 1996; Douglas & Kropp, 2002; S. D. Gottfredson & D. M. Gottfredson, 1986; Gottfredson & Moriarty, 2006; Hart, 1998; Jones, 1996). In recent decades, actuarial risk assessment is considered the most popular risk assessment tool because of its objectivity and solid predictive validity (Buchanan, Whitlow, & Austin, 1986; Gobeil & Blanchette, 2007; S. D. Gottfredson & D. M. Gottfredson, 1986). As a result, actuarial risk assessment has become the standard in classifying offenders in the correctional systems (Andrews & Bonta, 2003; Hart, 1998; Zinger, 2004).

Of the actuarial risk assessment inventories, the Level of Service Inventory-Revised (hereafter, LSI-R; Appendix A) is widely utilized in many developed countries including Canada, the USA, Australia, England and parts of Europe (Andrews & Bonta, 2003; Gendreau, Little, & Goggin, 1996; Girard & Wormith, 2004; Ogloff & Davis, 2004). The LSI-R also is considered a 'gender-neutral and culture-responsive' risk assessment inventory (Andrews & Bonta, 2003; Schlager & Simourd, 2007). To date, the LSI-R is one of the most promising risk assessment inventories that has been widely studied with various offender populations (Andrews & Bonta, 2003; Lowenkamp, Lovins, & Latessa, in press).

Even though multiple studies assert the validity of the LSI-R beyond gender and other cultural factors, prominent scholars consistently have expressed a concern that the LSI-R may overlook relevant factors for minority populations in prison, pointing out that the validity studies have been conducted dominantly with white male populations (Bloom, Owen, & Covington, 2003; Covington, 1998; Farr, 2000; Holsinger, Lowenkamp, Latessa, 2003; Holtfreter & Morash, 2003; Holtfreter, Reisig, & Morash, 2004).

Arguably, established risk assessment inventories including the LSI-R may discriminate against minorities due to the lack of relevant factors in terms of gender, race, and culture (Whiteacre, 2006). Because risk assessment is an inevitable process for any offender population the major becomes how to accurately assess risk of different offender populations in the correctional system (Taylor & Blanchette, 2009). Racial and gender issues have been neglected in assessing offenders' risk (Bloom et al., 2003). The primary concern of risk assessment would be to develop gender- and culture-responsive risk assessment inventories.

Overview of the Problem

As highlighted previously, risk assessment is an underlying procedure in managing prison populations, assigning appropriate correctional interventions for inmates, and predicting offenders' future behaviors (Listwan, Van Voorhis, & Ritchey, 2007). However, the current risk assessment practices have been developed for and applied primarily to white male inmates (Austin, 2003; Brennan & Austin, 1997; Hannah-Moffat, 2005; Holsinger et al., 2003; Whiteacre; 2006; Wright, Salisbury, & Van Voorhis, 2007). Such practices may cause misclassification[1] for women and minorities, which results in the maladjustment in prison and the failure to assign offenders to appropriate treatment programs. In turn, offenders' reintegration into the community may also be hampered by this (Austin, Chan, & Elm, 1993). The problems of current practices are discussed in terms of gender, race, and offense type.

Gender

Even with admitting the small portion of female population in prison populations, female offenders have consistently increased over the past 15 years. Since 1990, the female inmate population has increased annually on average 8.3%, while the annual rate of growth of male inmates has been 6.4% on average (Bureau of Justice Statistics, 2000). Nevertheless, gender frequently has been overlooked in assessing offenders' risk and needs because of "there being too few [female] to count" (Folsom & Atkinson, 2007, p. 1045). Table 1 shows the change of the prison population by gender and race since 1995.

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[1] Misclassification is divided into two categories: Over-classification and Under-classification. Overclassification (false positive) is the case that is predicted as a high risk case but results in no further offending. By contrast, underclassification (false negative) is the case that is predicted as a low risk case but results in additional problematic behavior (Austin & McGinnis, 2004; Whiteacre, 2006).

Table 1

Number of Prisoners under State or Federal Jurisdiction

Year	Male				Female			
	Total[a]	White	Black	Hispanic	Total[a]	White	Black	Hispanic
1995	1,021,059	487,400	509,800	N/A	63,963	30,500	31,900	*N/A*
1996	1,068,123	511,300	528,600	N/A	69,599	33,800	33,900	*N/A*
1997	1,121,663	541,700	548,900	N/A	73,835	36,300	35,500	*N/A*
1998	1,216,053	N/A	N/A	N/A	84,354	N/A	N/A	*N/A*
1999	1,222,799	403,700	558,700	219,500	82,594	27,100	38,300	14,100
2000	1,247,000	401,900	532,400	242,600	84,300	33,600	32,200	13,100
2001	1,259,481	449,200	585,800	199,700	85,031	36,200	36,400	10,200
2002	1,291,326	436,800	586,700	235,300	89,044	35,400	36,000	15,000
2003	1,316,495	454,300	586,300	215,900	92,785	39,100	35,000	16,200
2004	1,337,700	449,300	551,300	260,600	96,100	42,500	32,100	15,000
2005	1,362,500	459,700	547,200	279,000	98,600	45,800	29,900	15,900
2006	1,401,400	478,800	535,100	291,000	103,300	49,200	28,600	17,500
2007	1,427,300	471,400	556,900	301,200	105,500	50,500	29,300	17,600

[a] includes "others" such as Asian, American Indians, Alaska Natives, Native Hawaiians, and other Pacific Islander.   (Bureau of Justice Statistics, 1995-2007)

The Bureau of Justice Statistics indicates a rapid growth in the female prison population. Female offenders represent, on average, 7% of the entire prison population in 2007. Furthermore, the U.S. prison population has increased, on average, 2% annually since 2000. Whereas the male population in prison increased 1.9% during 2007, the female population in prison increased 3.2% during the same time period. These statistics confirm that the female prison population increased more rapidly than the male prison population (Van Voorhis, Salisbury, Wright, & Bauman, 2008).

A number of criminologists agree about the importance of gender in assessing risk and needs of offenders (Austin, Hardyman & Brown, 2001; Belknap & Holsinger, 2006; Benda, 2005; Blanchette, 2002; Bloom et al., 2003; Chesney-Lind, 1997; Farr, 2000; Heilbrun, Dematteo, Erickson, Yasuhara, & Anumba, 2008). Yet, the fact that female offenders have represented a relatively small portion of the United Sates prison

population has resulted in a justification of their being "overlooked" practically and academically. To date, this results in the development of risk assessment inventories being mainly focused on male offenders.

With the increase of female offenders in prison, recidivism among female offenders is a significant problem. Using follow-up periods of 2-5 years, the recidivism rates of female offenders vary from 22% to 57.6% (Folsom & Atkinson, 2007; Heilbrun et al., 2008). Recidivism rates vary depending on the length of follow-up period and the definition of recidivism. Recidivism is defined broadly and two common measures are re-incarceration and re-arrest (Pennsylvania Department of Corrections, 2006). In general, 51.8% of released offenders returned to prisons within two years (MTC Institute, 2003). In particular, the recidivism rate in Pennsylvania State Correctional Institutions shows a little lower than the general recidivism rate, and the overall recidivism rate increased from 43.6% in 1999 to 46.3% in 2002 (PADOC). Even though male offenders have significantly higher recidivism rates than female offenders, the recidivism rate of female offenders has fluctuated to over 30%, which should not be ignored, as Table 2 presents.

Table 2

Recidivism Rates by Gender

Year	Male			Female		
	N	1 Year	3 Years	N	1 Year	3 Years
1999	10,694	23.7%	44.1%	613	16.8%	32.8%
2000	10,840	24.6%	46.5%	718	18.7%	35.5%
2001	10,778	26.0%	47.1%	728	21.7%	36.7%
2002	10,887	25.4%	47.0%	783	16.3%	32.1%
2003	12,845	26.3%	N/A	969	19.3%	N/A
2004	13,710	26.3%	N/A	998	21.7%	N/A

(PADOC, 2006, p.5)

Given the purpose of classification and risk assessment, correctional programs should be assigned according to female offenders' special risk and needs in order to

reduce the recidivism rate. The criticism that classification practices using male-oriented

risk assessment tools have limitations in reducing female offenders' recidivism certainly

has merit (Hannah-Moffat & Shaw, 2001; Reisig, Holtfreter, & Morash, 2006).

Still, even with the criticism from feminist criminologists about differences in risk

and needs of female offenders (Holsinger et al., 2003), most states have utilized male-

centered risk assessment tools for female offenders, typically without any modifications

(Bloom et al., 2003; Farr, 2000; Van Voorhis et al., 2008). A limited body of research has

examined the validity and reliability of male-centered risk assessment instruments for use

with female populations. In the same context, Belknap & Holsinger (2006) argued, "one

of the greatest limitations of existing criminological research is the low priority given to

the role of gender in the etiology of offending" (p. 48). In the field of etiology, gender has

also been overlooked in the field of risk assessment. Correctional classification also

should take into account the gender-related factors by considering offender's personal

concerns such as family issues, psychological problems and other factors that may

increase the possibility of recidivism (Listwan et al., 2007). So, it is an imminent issue to

identify gender-specific factors in assessing risk of female offenders.

Race

Racial disparity in US prison populations has been a chronic issue in corrections

(Gottfredson & Jarjoura, 1996) as reported Table 1. As a matter of fact, racial minority

groups comprise the majority of the prison population given the fact that male

imprisonment rates were 3,138 for Black males, 1,259 for Hispanic or Latino, and 481 for

White, per 100,000 U.S. residents according to 2007 prisoner statistics (Bureau of Justice

Statistics, 2008). Female imprisonment rates also show the identical trends, that is, 150

for Black, 79 for Hispanic, and 50 for White, per 100,000 U.S. residents (Bureau of Justice Statistics). Regardless of gender, prison populations have disproportionately represented by African Americans and Hispanics.

Many risk measurement variables are related to race. For instance, the risk assessment factors such as education and employment are "class-based variables" that may discriminate against minorities (Whiteacre, 2006). Since many established risk assessment instruments have been validated for white-male inmates, the utility of those tools for minorities would be in question (Bloom, Owen, & Covington, 2003; Whiteacre, 2007). Such practices raise the potential problems of over-classification especially for Blacks. Given that the primary advantage of risk assessment inventories is to yield useful information about rehabilitation services for inmates as well as determining risk levels (Schlager & Simourd, 2007), in the case of misclassification, the decision making about treatment programs may be inaccurate, resulting in the waste of correctional resources. Thus, it is very important to develop risk assessment inventories that include relevant risk factors for minority populations in corrections.

Furthermore, the recidivism rate of African American offenders showed the highest rate, 48.8% over three-year follow-up period, among those who were released in 2002, while the recidivism rates for Whites and Hispanics were 43.0% and 44.1% respectively during the same time period (PADOC, 2006). These statistics indicate that different risk factors may affect recidivism according to race. African Americans had consistently higher return rates than Whites and Hispanics as shown in Table 3.

Table 3

Recidivism Rates by Race

Year	White			Black			Hispanic		
	N	1 year	3 years	N	1 year	3 years	N	1 year	3 years
1999	3,731	22.0%	40.2%	6,297	24.6%	46.0%	1,221	21.1%	42.3%
2000	3,682	21.3%	40.6%	6,427	26.3%	49.3%	1,398	23.1%	45.3%
2001	3,852	23.5%	41.6%	6,289	27.1%	49.3%	1,309	26.0%	48.4%
2002	3,800	22.9%	43.0%	6,369	26.3%	48.8%	1,439	23.5%	44.1%
2003	4,697	23.9%	N/A	7,251	27.3%	N/A	1,797	24.8%	N/A
2004	5,362	26.0%	N/A	7,481	26.5%	N/A	1,795	23.3%	N/A

(PADOC, 2006, P. 6)

Risk assessment instruments should take into account variations in risk and needs to address recidivism rates according to race or ethnicity. Gottfredson and Jarjoura (1996) emphasized that "racial, ethnic, gender or other biases have been part of past practice [of statistical risk assessment]" (p. 53), and Tonry (1987) claimed that classification systems may cause a different impact on racial or ethnic groups, with a harsher impact on minorities and the poor.

Offense Type

Besides these demographic factors, offense type would be a plausible factor in determining offenders' risk and needs. Limited studies confirmed the distinct features of risk and need factors depending on the offenders' offense type (Loza & Simourd, 1994; Hollin & Palmer, 2003). Given that violent offenders are of great concern in the criminal justice system due to their high rates of recidivism (Hollin & Palmer, 2003), the unique criminogenic factors of violent offenders should be investigated.

In this vein, Harris, Rice, & Cormier (2002) compared violent and non-violent recidivism rates[2] among violent offenders with mental problems, using one of the clinical assessment tools. Even with the dominance of actuarial risk assessment inventories, the

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[2] Harris, Rice, & Cormier (2002) measured non-violent recidivism as reconviction of non-violent crime and violent recidivism as reconviction of violent crime.

clinical risk assessment tool outperformed the LSI-R in predicting violent recidivism among participants in their research. Their study suggests that the predictive validity of risk assessment inventories would vary depending on subjects' offense type.

More specifically, property crime offenders showed the highest return rates of 51.0% within three years, compared to the recidivism rates of murderers and sex offenders, 37.2% and 25.6%, respectively (PADOC, 2006). Between 1999 and 2002, property crime offenders reoffended at the rate of 50%, while sex offenders recorded a 25% recidivism rate and offenders who committed murder and assault displayed recidivism rates ranging from 36% to 38% (PADOC). It implies that recidivism rates, to some extent, are associated with offense type. Accordingly, it is conjectured that offense type would be a relevant factor in predicting further criminal behaviors. However, there is no research examining the impact of gender and offense type on recidivism as well as on risk and need assessment. Introducing such a variable in risk assessment can lead to develop a more valid classification instrument and to improve correctional interventions, toward reducing recidivism.

In conclusion, gender and race should be considered for assessing risk levels of offenders and for providing appropriate services and levels of intervention, as many criminological scholars have agreed (Blanchette, 2002; Belknap & Holsinger, 2006; Hollin & Palmer, 2006a; Holsinger et al., 2003; Palmer & Hollin, 2007; Sorbello, Eccleston, Ward, & Jones, 2002). In addition, offense type as well as gender and race should be considered as major factors in assessing offenders' risk and needs.

Purpose of the Study

Given these concerns, the primary purpose of this research is to assess the validity of the LSI-R for minority populations including female offenders in prison. This study is to examine the impacts of gender, offense type, and their interaction and racial impact on the LSI-R and recidivism. The LSI-R has been utilized to classify offenders for the purposes of treatment and prevention of re-offense by attempting to accurately assess offender risk and needs (Schlager & Simourd, 2007). Even though a considerable body of research about the LSI-R has been conducted, the proposed research differs from previous research in considering gender, offense type, and race as variables affecting LSI-R risk scores and recidivism. The additional goal of this study is to identify promising criminogenic factors for various offender groups.

To achieve these goals, the proposed study seeks to explore the meaning and importance of classification systems and risk assessment in the correctional system. Secondly, throughout the extensive literature review, the study documents the historical scheme of evolution of classification systems and risk assessment inventories as well as the theoretical underpinning of the LSI-R. Finally, based on the theoretical and accumulated information about risk assessments, this study empirically assesses the following research questions through the analyses of archival data from the Pennsylvania Department of Corrections (hereafter, PADOC).

1. Does the LSI-R score profile differently according to gender and offense type, and race?

2. To what extent is the LSI-R a valid predictor of recidivism by gender and offense type, and race?

3. Which LSI-R risk subscales are salient in assessing criminogenic needs according to gender, offense type, and race?

Policy Implication

Classification systems in corrections seek to accurately predict offenders' future behaviors for achieving placement in the appropriate security level, assignment to suitable rehabilitation programs, and reduction of recidivism, as emphasized previously. The purpose of this research is to provide a comprehensive assessment of the applicability of the LSI-R for gender and different offense types, as well as for different races. By conducting this research, it would merit noting that male and female offenders exhibited different needs as different racial groups showed different risk levels and needs.

First, this study can provide guidelines for the interpretation for the LSI-R scores by gender, race and offense types. Although the LSI-R manual (Andrews & Bonta, 2001) provides cut-off scores for male and female offenders in determining high, medium, and low risk levels, it suggests utilizing different cut-off scores according to the characteristic of offender groups. This study, therefore, can examine how gender, offense type, and race affect cutoff scores in classifying into high, medium and low risk level offenders by analyzing recidivism rates.

Second, through an effort to identify specific criminogenic factors for minorities in the correctional system, the research can make a contribution to the development of correctional programs that target more valid risk-need factors for a specific population in the correctional system. To be precise, this study provides information about intervention factors for each offender group.

Third, the research explored the characteristics of high risk offender groups in terms of gender, offense type, and race. By doing so, the research was expected to offer a better understanding about how these variables impacted the plausibility an individual would be categorized as a high-risk offender, who required intensive supervision.

Finally, the proposed study is expected to contribute to the development of prediction and classification instruments by providing answers about what adjustments can be made to the LSI-R that may improve the risk assessment for minority populations including women in prison.

Summary

This introduction provides the rationale for the present research through a brief review of the issues in risk assessment practices in terms of gender, offense type, and race. As has been noted, the critical function of risk assessment in the correctional system has led to efforts to develop new risk assessment tools. Even with these efforts, there have been concerns as to whether these inventories are applicable to women and minorities in correctional facilities. Therefore, the proposed study seeks to examine the predictive validity of the LSI-R by gender, offense type, and race. Also, the research compares its ability to identify the criminogenic needs of 10 LSI-R subscales for male and female violent and non-violent offenders and different races. This study features archival research because the data set was drawn from the PADOC data base system.

Chapter II reviews conceptual models of classification and risk assessment as well as a historical exploration of risk assessment inventories in the criminal justice system. The review of literature also examines the nature and importance of offender risk assessment in the correctional system as well as the theoretical background of the LSI-R.

In sequence, gender, offense type, and race, with other issues, are discussed in detail. More specifically, this chapter addresses why gender is an important factor in assessing offenders' risk and how inventories should be developed to accurately assess female criminality. The chapter further examines racial issues in assessing offenders' risk by introducing multiple studies. Additionally, empirical research on the LSI-R that has been carried out in the United States, Canada, and England is extensively reviewed.

Chapter III begins with addressing research questions and the proposed hypotheses of the current study. Methodology is discussed, which includes the definitions of variables and the data collecting procedures. Finally, the analysis plan is discussed in depth.

Chapter IV reports descriptive statistics for the participants and analysis procedures step by step and results of statistical analyses. In addition, it includes how these correlations between variables can be explained or inferred to the populations by discussing the results of hypothesis testing.

Chapter V explores the implications of future classification systems depending on the gender and races. Also, it recommends for developing risk assessment inventories for the general prison population and 'gender-responsive' risk assessment inventories for female offenders and minorities. It also includes a conclusion.

CHAPTER II

LITERATURE REVIEW

Introduction

Offender classification in corrections depends mainly on the prediction of dangerousness or level of risk posed by an inmate to the correctional institution and to the community (Austin, 2003; Champion, 1994; Farr, 2000; S. D. Gottfredson, 1987). Thus, risk assessment is commonly adopted as a primary classification method for the purpose of prediction of the offenders' dangerousness. Once risk assessment identifies an offender's risk level, then a treatment program can be assigned to the offender, ultimately in order to reduce recidivism after release (Austin, 2003; Bonta, 1996; Champion, 1994; Glaser; 1987; D. M. Gottfredson, 1987; Tonry, 1987). Therefore, accurate risk prediction is the underlying mechanism for improving efficiency of the criminal justice system (Andrews & Bonta, 2003; Austin; 2003; Bonta, 1996; Brennan, 1987b; Dhaliwal, Porporino, & Ross, 1994; Sechrest, 1987). Hence, there have been efforts to develop science- and evidence-based risk assessment inventories through the identification of risk factors that can increase the accuracy of risk prediction.

First, this chapter begins with an explanation about the major concepts of classification and a historical overview of classification, including its theoretical bases in the correctional system. As one of the major subcategories of correctional classification, risk assessment is presented conceptually and historically including the evolution of the inventories and the current state of risk assessment technology. Second, the chapter also reviews the significance of gender, offense type, and race in assessing an offender's risk level by presenting relevant literature. Finally, among various risk assessment inventories,

the LSI-R and its underlying theory are explained and the findings of established research about the LSI-R are summarized.

Definition of Classification in the Criminal Justice System

D. M. Gottfredson (1987) stated that classification "refers either to the arrangement or division of entities into groups according to some system or principle or to the placement of entities into groups according to rules already determined" (p. 1). His definition focuses on the institutional principle of classification for the purpose of developing similar groups based on institutional needs.

Champion (1994) defined the term more broadly by referring to the procedure of grouping persons based on their specific characteristics, indicating the importance of the scientific measurement of an offender's risk. He emphasized the general nature of a classification system throughout the procedure of the entire criminal justice system regardless of the specific purposes intended.

Sechrest (1987) defined classification as a process of placing offenders into groups assumed alike for decision-making purposes, arguing that the term of classification has been used in a very vague way in a practical setting. This definition is more related to the purpose of classification than to the classification procedure itself. Similarly, Andrews and Bonta (2003) defined classification in corrections as a procedure to identify similar subgroups in order to implement correctional interventions. These authors place the emphasis on the decision-making process that assigns offenders to appropriate treatment programs in a correctional setting.

In the same context, Brennan (1987b) referred to classification systems as "means for maintaining institutional safety and order, for providing inmates protection and

services, and for managing and allocating personnel and resources" (p. 323). His definition provides more specific purposes of classification in terms of utilization of limited resources in corrections.

While D. M. Gottfredson (1987) and Champion (1994) emphasize the procedure of classification itself, Sechrest (1987), Andrews and Bonta (2003), and Brennan (1987b) focus on the purpose of the classification within the correctional system. Although there are some variations among these definitions of classification, the concept of classification is recognized as a procedure to form homogenous groups according to specific purposes. Based on the discussion above, the purpose of classification can be interpreted as two-fold. First is the improvement of public and institutional safety by addressing an offender's risk level and second is the appropriate assignment of correctional interventions. Thus, classification, to some extent, involves the prediction of an offender's future behavior, which is utilized for every stage of the criminal justice decision (Brennan, 1987a).

Classification systems intrinsically employ prediction[3] of offenders' behaviors and risk assessment procedures, so it is difficult to separate those functions conceptually or practically in the correctional system. This explains why the terms of classification, prediction, and risk assessment often have been used interchangeably, even with their different functions and applications in the correctional system.

Historical Overview of Classification Systems

Historically, the emergence and evolution of classification systems was intertwined with the development of the criminal justice system (Brennan, 1987a; D. M. Gottfredson, 1987). Early in the history of criminal justice, there were primitive

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[3] D. M. Gottfredson (1987) stated that prediction is one potential purpose of classification.

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classification procedures, although they were not recognized as classification systems. For example, Lombroso's work on criminal type, dating back to 1870 (Lombroso, 1876/1912) can be interpreted as an early attempt at empirical classification, using an etiological approach for criminal typologies. In the early 1900s, Goring's study also focused on physical and psychological characteristics identifying etiological factors in crime (Goring, 1913/1972; see also D. M. Gottfredson, 1987). Although these early efforts appeared as atheoretical and non-scientific methods, they are credited as a starting point for theoretical and empirical applications to classification (D. M. Gottfredson, 1987). However, a historical review of criminal justice classification systems begins with more recent endeavors, since such early classification efforts were grounded from etiological perspectives of crime rather than correctional perspectives. Whereas Brennan (1987a) identified three eras of classification history, Hannah-Moffat & Shaw (2001) added a fourth era, which was recognized after the 1990s as a new trend.

Early Classification Systems

Brennan (1987a) identified classification practices before the 1900s as "the impressionistic stage" because the classification system appeared personal and subjective as performed by philosophers and scholars. These classification systems did not yield a scientific categorization for offenders; furthermore, they were not reliable. In particular, Brennan criticized their over-simplification which resulted in inappropriate custody placements and assignment of interventions. At that time, the recognition of classification for correctional custody placement and treatment programs did not exist because the main objective of this era was to ensure institutional security and public safety through

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prevention of offenders' violence and escape by incapacitation (Hannah-Moffat & Shaw, 2001).

Clinical and Theoretical Era

During the first half of the 20th century, correctional philosophy was based on treatment and reformation (MacKenzie, 2001); for this reason, classification systems utilized standardized clinical tests and checklists administered by behavioral scientists. This stage is referred to as a clinical theorizing stage. The clinical approach was commonly defined as subjective assessments because it was based on subjective factors, such as personality and attitude (Andrews & Bonta, 2003; Brennan, 1987a; Hannah-Moffat & Shaw, 2001; Hart, 1998; Jones, 1996; Zinger, 2004). In addition to these subjective factors, this classification system utilized length of sentence, offenses, age and gender (Brennan, 1987a) as major factors that still are considered major factors. However, research indicated that clinical methods caused over-classification due to the lack of predictive validity and accuracy in assessing risk (Austin, 1983; Bonta & Motiuk, 1990; Brennan, 1987a; Hannah-Moffat & Show, 2001).

Security-based Classification Era

In the early 1970s, the correctional philosophy shifted from reformative to punitive perspectives, which brought about the major change in corrections toward institutional security and public safety (Hannah-Moffat & Shaw, 2001; McKenzie, 2001). In order to achieve institutional security and public safety, the main purpose of classification was to predict an offender's misconduct in order to control violence within the institution.

At the same time, criminal justice practitioners began to recognize the necessity of a new approach to improve the predictive validity of classification (Brennan, 1987a) because security and custody classification was still based on discretion and subjectivity depending on a clinical checklist (Bohnstedt & Geiser, 1979; Hannah-Moffat & Shaw, 2001). The most important implication of this era was the acknowledgement of the necessity for scientific classification systems; which provided the grounding for the emergence of actuarial classification systems for the following era. For this reason, Brennan (1987a) named this era the Transition Stage.[4]

Risk-based Classification Era[5]

From the late 1970s, the purposes of classification became more specific and sophisticated than that of the earlier stages. Classification systems were aimed at assessing and managing risks such as risk of escape, risk to other prisoners, to themselves, to staff, and to the public (Hanna-Moffat & Shaw 2001). Since 1980, as responses to prison overcrowding and limited resources, most correctional institutions in the United States have adopted "an objective prison classification system"[6] (Alexander & Austin,

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[4] Whereas Hannah-Moffat & Shaw (2001) identified evolution of classification stages based on the changes of correctional philosophy, Brennan (1987a) addressed the historical review on classification according to the methods used for classifications. Even with using different standards to differentiate historical stages of classification systems, their chronicle distinctions and characteristics of each stage are identical.

[5] Brennan(1987a) named this stage as "the state of multivariate quantitative classification" to indicate that actuarial classification systems started to dominate in the criminal justice system. However, Hannah-Moffat & Shaw (2001) preferred to use "risk-based classification era" to distinguish it from a classification system based on "risk-needs," which is the more developed principle in the actuarial classification era.

[6] To reduce the individual's subjectivity and discretion in assessing offender's risk, an objective classification system has been highly recommended for every correctional department since the 1980s. Its goal is to find the best correctional programs according to an offender's individual characteristic. It utilizes reliable and valid factors to assess an offender's risk including "escape profile, severity/violence of the current offense, history of violence, length of sentence, presence of pending charges and/or detainers, discipline history, and security risk group membership." With regard to the offender's needs, it includes "medical/mental health, education, vocational & work skills, substance abuse, sex offender treatment, and family/residence/community resources" (CT DOC, 2005, p.4; see also, Austin, 2003; Buchanan et al., 1986; Hardyman, Austin & Tulloch, 2002). Also, it serves in decision making about an inmate such as "booking and bail decision making, prosecutorial decision making, inmate classification & management decision making, and periodic reassessments"(Champion, 1994, p. 3-5).

1992; Austin, 2003; Austin & Hardyman, 2004; Austin & McGinnis, 2004; Buchanan et al., 1986; Champion, 1994). From this era, actuarial risk assessments referred to standardized objective risk assessment tools derived from criminological theory and empirical research (Andrews & Bonta, 2003).

In particular, actuarial risk assessments have improved the validity and reliability in predicting an offender's risk (Andrews & Bonta, 2003; Brennan, 1987a; Buchanan et al., 1986; Gobeil & Blanchette, 2007; Hannah-Moffat & Shaw, 2001). Since this era, actuarial methods are the most popular risk assessment tools. Currently, they have become the standard for classifying offenders in the criminal justice system by empirically documenting a higher level of reliability and validity than clinical risk assessments (Andrews & Bonta, 2003; Austin & McGinnis, 2004; Blanchette & Taylor, 2005; Buchanan et al., 1986; Hannah-Moffat, 2004; Hart, 1998; Holsinger et al., 2003).

Risk/Need-based Classification Era

Since the 1990s, multiple research findings have increasingly argued that rehabilitation programs are more effective in reducing recidivism than harsh punishment (Andrews & Bonta, 2003; Gendreau & Andrews, 1990; MacKenzie, 2001; Ward & Stewart, 2003). Yet, existing classification systems did not include need factors. Accordingly, in order to meet a new goal of corrections, the need assessment of offenders, particularly criminogenic needs, became an important part of risk assessment (Hannah-Moffat & Shaw, 2001). Thus, those recently developed classification systems, based on risk and need factors, have improved the assessment of program needs for offenders (Austin 2003; Gottfredson & Moriarty, 2006; Kroner & Mills, 2001). Accordingly, the

current classification inventories constitute risk-need factors developed by actuarial methods, which is considered a norm in classification practices.

<div align="center">Conceptual Understanding of Risk and Need</div>

Defining Risk and Risk Assessment

Austin and McGinnis (2004) provided a detailed definition of risk for the correctional system. They stated that "risk refers to an inmate's potential for serious misconduct within the prison setting, escape attempts, recidivism and the level of threats the inmate poses to public safety" (p. 7). Such a definition can be divided into two categories: institutional risk, meaning dangerousness to others and to the offender himself/herself while in prison, and non-institutional risk, meaning dangerousness to the community after release. Austin and McGinnis' definition seems to be widely accepted and utilized in order to conceptually understand risk in corrections.

In an effort to understand risk, it is important to comprehend what risk assessment means within the correctional system. Douglas and Kropp (2002) defined risk assessment as "the process of speculating in an informed way about the aggressive acts a person might commit and to determine the steps that should be taken to prevent those acts and minimize their negative consequences" (p. 619). They highlighted violence prevention as the goal of risk assessment, rather than risk prediction itself.

Furthermore, Taxman and Thanner (2006) described risk assessment as a process to identify individual and historical factors conducive to the involvement in criminal behaviors, such as the age of first arrest, number of prior arrests, number of incarcerations, and educational achievement. According to them, risk assessment is a procedure to measure the offender's risk factors that may cause a risk to self or others, to

staff, and to the public. Hence, the present study defines risk assessment as the determination of offenders' dangerousness to themselves (i.e. the probability to self-harm) and others within the correctional settings as well as to public safety after their release.

Thus, risk assessment starts with identifying risk factors that may lead to criminal behaviors of offenders. Early literature about risk assessment categorized risk factors into static and dynamic factors, based on the possibility of changes over time. Static risk factors refer to those that "do not change or change in one direction" such as gender, age, criminal history (Bonta, 2002, p. 367; see also, Andrews & Bonta, 2003; Austin & McGinnis, 2004; Douglas & Kropp, 2002; Gottfredson & Moriarty, 2006; Simourd & Hoge, 2000; Taxman & Thanner, 2006; Ward & Steward, 2003).

By contrast, dynamic factors can be changed, and, thus, are more directly associated with criminal behaviors, such as mental health, substance abuse, attitude and orientation, family functioning, criminal peers, employment and psychosocial functioning (Andrews & Bonta, 2003; Hannah-Moffat, 2006; Taxman & Thanner, 2006). Later, as risk assessment inventories have evolved toward expanding more relevant factors to accurately predict future behaviors of an offender, the term "dynamic risk factors" has been gradually supplanted by the term 'criminogenic need' factors. During the past decade, criminogenic need factors appear more widely accepted than dynamic factors in the literature about classification and risk assessment.

Defining Need and Need Assessment

Although risk assessment already included the concept of criminogenic need by measuring dynamic factors, researchers started to distinguish need factors from risk

factors. The term of need implies offender-oriented programming and rehabilitation perspectives in corrections (Andrews, 2006; Andrews & Bonta, 2003; Gendreau et al., 1996). The concept of need has been divided into criminogenic need and non-criminogenic need. Both criminogenic need and non-criminogenic need are dynamic in nature, but the distinction between the two is whether or not it is associated with reoffending (Andrews & Dowden, 2006). In other words, when the criminogenic need changes, the recidivism rate is expected to decrease or increase. When the non-criminogenic need of an inmate changes, however, the recidivism rate is not necessarily affected (Andrews & Bonta, 2003; Adnrews et al., 1990; Bonta, 2002; Hannah-Moffat, 2006; Simourd & Hoge, 2000).

With regard to need assessment, the criminogenic needs mean "the degree to which deficits exist, particularly those that affect the propelling of the offender to continue criminal behavior," regardless of an offender's perception of what he or she needs (Taxman & Thanner, 2006, p. 31). Consequently, the most important aspect in need assessment is to find the factors that correctional programs should target to reduce recidivism (Hannah-Moffat & Shaw, 2001; Hanson, 2005; Simourd & Hoge, 2000). Need assessment facilitates obtaining information about the level of risk and need of an offender, the actual amount of treatment, and program components targeting individual's criminogenic needs (Andrews & Bonta, 2003; Andrews & Dowden, 2006; Champion, 1994; O'Keefe, 1998). On the other hand, non-criminogenic needs are regarded as human considerations and treated as low priority in corrections, unless it poses imminent threats to inmates (Andrews & Bonta; Andrews & Dowden, 2006; Hannah-Moffat, 2006;

Raynor et al., 2000). Table 4 presents examples of criminogenic and non-criminogenic needs from Andrew and Dowden's research.

Table 4

List of Criminogenic and Noncriminogenic Needs

Criminogenic Needs	Non-criminogenic Needs
Academic	Vague or emotional personal
Anger or negative affect	Physical activity
Individualized needs assessment	Fear of official punishment
Self-control	Increase conventional ambition
Pro-social model	Family: Other interventions
Antisocial attitude	Increase cohesive antisocial peers
Vocational skills	Increase self-esteem
Vocational skills and job	Respect criminal thinking
Family: Affection	Improve living conditions
Substance abuse treatment	
Reduce antisocial peers	
Relapse prevention	
Family: Supervision	
Reduce barriers to treatment	

(Andrews & Dowden, 2006, p. 93)

Risk-Need-Responsivity Principle

Historically, the development of risk assessment is in identifying the factors that are most likely associated with criminal behaviors. After embracing risk-need assessment as the norm in offender classification, the concept of responsivity has been gaining much attention in order to improve the efficiency of correctional programs. Taxman and Thanner (2006) argued the "risk-need-responsivity principle" was introduced as a classification model in the 1960s by several researchers such as Sechrest and Palmer. However, it failed to draw much attention from practitioners and researchers because classification systems were not clearly conceptualized at that time.

The risk-need-responsivity principle started to prevail in the late 1980s and early 1990s (Andrews, 2006; Gendreau et al, 1996). Currently, the risk-need-responsivity principle constitutes a mainstay of offender classification (Andrews, 2006; Taxman &

Thanner, 2006). Also, risk-, need-, and responsivity-principle are used as separate terms according to their functions in the criminal justice system. First, the risk principle is referred to as the consideration of the possibility of reoffending, asserting that correctional intervention should be primarily focused on high risk offenders (Smith, Cullen, & Latessa, 2009). Second, the need principle indicates that individualized criminogenic needs should be identified to assign appropriate correctional programs for offenders (Hannah-Moffat, 2006). Finally, the responsivity principle, as a more elaborated and client-oriented perspective, means that correctional interventions should meet the offender's ability and learning style by considering exclusive individual factors such as gender, age, culture, disability, mental health, and victimization (Simourd & Hoge, 2000; see also, Hannah-Moffat, 2006). Therefore, the current trend in risk-need assessment is superseded by the risk-need-responsivity principle. In particular, recently developed risk assessment instruments have reflected this principle.

Historical Overview of Risk Assessment Inventories

As mentioned previously, the development of risk-need assessment inventories has been affected by a shift in correctional philosophy and practices leading to an emphasis on classification. Technically, risk-need assessments have evolved from the use of clinical information that failed to predict violent behavior in the future, toward the use of actuarial data with theoretical foundations (Clements, 1996; Glaser, 1987; Jones, 1996; Mills, 2005).

Bonta (1996), in his early work, classified the history of risk assessment instrument into three generations, using the terms "first, second, and third generation assessment," where he also characterized distinct features of each generation. Also, in

this work, he emphasized that rapid progress in developing risk assessment inventories would happen in the following decade. Furthermore, he predicted the emergence and utilization of a fourth generation assessment in the near future. More recently, Andrews et al. (2006) described the emergence of the fourth generation of risk assessment tools, as "the professional judgment era", as Bonta predicted a decade ago. In brief, the development of risk assessment inventories is an expanding process of assessment factors from risk to needs, and finally to responsivity (Andrews, 2006; Hannah-Moffat, 2006). A brief description of these four generations of risk assessment follows.

First Generation (1G)

Bonta (1996) explained this generation as "subjective assessment, professional judgment, intuition and gut-level feelings" (p. 19). The time period for this generation was the early twentieth century, the same time period as the early classification era. Hence, it characterized subjective assessment based on unstandardized professional description about probable offender behaviors in the future (Andrews et al., 2006). Considering the development of risk assessment inventories, this is the most primitive evaluation about an offender's risk level but, to some extent, this approach is still utilized.

The major criticism of this generation was mainly due to the use of personal discretion to determine an offender's risk level and the lack of a supervision policy (Bonta, 1996). Accordingly, accountability for supervision and placement was dependent on each professional's discretion.

Second Generation (2G)

Bonta (1996) limited the second generation to the years between the early twentieth century and 1979. He explained Burgess' study as a cornerstone for this generation because Burgess' study empirically explored parole success and failure. Moreover, Burgess constructed a risk scale, which, although somewhat modified, has remained the foundation for the third and the fourth generation risk assessment. Also, Burgess' study provided methodological foundations for the field of risk assessment. A considerable progress in risk assessment was achieved for fifty years after Burgess's study.

During the 1970s, risk assessment research expanded and developed various objective risk scales, such as the Salient Factor Score, the Psychopathy Checklist-Revised (hereafter, PCL-R), and the Statistical Index on Recidivism (Andrew et al., 2006; Bonta, 1996). Risk assessment inventories of this generation are categorized into an actuarial approach, whereas the first generation assessment is considered as clinical methods. Although they are based on standardized objective risk prediction instruments, the major disadvantage of these instruments is that they only contain static predictor variables (Bonta, 1996; Gendreau et al., 1996; Zinger, 2004). Accordingly, this approach predicts a risk level that remains the same over time. So, the instruments of this generation fail to provide information for offender treatment by overlooking dynamic factors (Andrews et al., 2006; Bonta, 1996), leading to limited ability in predicting and reducing recidivism.

Third Generation Assessment (3G)

The major development of third generation instruments is the recognition not only of static factors but also of dynamic factors. In this generation, both dynamic and static

factors are discretely included in risk assessment items (Bonta, 1996). Later, such interest resulted in refinement of risk assessment instruments by defining dynamic risk factors as criminogenic and non-criminogenic need, as mentioned previously.

The new initiative in risk assessment has provided the rationale for constructing changeable needs that correctional programs targeted in order to meet the goal of rehabilitation in correction in the 1990s (Hannah-Moffat & Shaw, 2001). In particular, the third-generation instruments have advantages in "guiding delivery of rehabilitation and measuring changes of offenders" (Simourd, 2004, p. 307), which also is the current focus of correctional agencies.

This generation marks the development of several widely used offender risk assessment instruments, including the Wisconsin Risk and Needs Assessment and the LSI-R (Andrews & Bonta, 2003; Reisig et al. 2006). By the early 1990s, the PCL-R was considered one of the best tools to predict risk and to evaluate the personality of offenders (Gendreau, Goggin, & Smith, 2002). However, throughout the comparisons of meta-analyses of the LSI-R and the PCL-R, the LSI-R indicated better validity in predicting recidivism than any other risk assessment inventory (Andrews & Bonta, 2003; Gendreau et al., 2002). Currently, more than 900 agencies in the United States administer the LSI-R as their primary risk/need assessment tool (Lowenkamp et al., in press).

Fourth Generation Assessment (4G)

Fourth generation inventories are still in the development stage, incorporating an objective actuarial approach with professional judgment, which are referred to as "structured professional judgment" (Austin & McGinnis, 2004; Douglars & Kropp, 2002). The major difference between fourth generation and the former generations is the

incorporation of professional judgment with actuarial measurement. Given that risk-need

evaluation should be conducted by guidelines drawn from theoretical, clinical, and

empirical research, this generation will be expected to develop an instrument that

evaluates risk by maintaining a balance between objective and subjective judgment for

practical use.

Even with the ideal concept of the fourth generation's approach, empirical

applications are still limited and its practical feasibility is in question. The 4G assessment

tools include the Correctional Assessment and Inventory System (CAIS), the

Correctional Offender Management Profiling for Alternative Sanctions (COMPAS), the

Offender Intake Assessment of Correctional Service Canada (OIA), and the Level of

Service/Case Management Inventory (LS/CMI) (Andrews et al., 2006). Recently, Fass,

Heilbrun, Dematteo, & Fretz (2008) conducted research to assess the relationship

between the COMPAS recidivism score and re-arrest rate, but they found that the

predictive validity was not significantly reliable.

<div align="center">Theoretical Underpinning of the LSI-R</div>

Andrews and Bonta (2003) developed LSI in the late 1970s in Canada, with the

collaboration of probation officers, correctional managers, practitioners, and researchers.

Later, the LSI was modified and improved and it was published as the LSI-R in 1995

(Andrews & Bonta, 2001). To date, Andrews and Bonta have generated at least four

subsequent versions: the LSI-R, the Young Offender Level of Supervision Inventory

(YO-LSI), the Youth Level of Service/Case Management Inventory (YLS/CMI), and the

Level of Service Inventory-Ontario Revision (LSI-OR) (Girard & Wormith, 2004).

As one of the third generation assessment tools, the LSI-R measures offenders'

risk and need levels and provides information about the level of service necessary for an

offender. Andrews and Bonta (2003) explained the LSI-R as "a theoretically-based risk-

needs offender assessment" and provided underlying theories for the LSI-R as follows:

> Theories of criminal behavior can be grouped into three groups: (1) sociological,
>
> (2) psychological, and (3) social learning theories. Sociological theories explain
>
> crime as a product of social-economic-political forces; the psychopathological
>
> theories see a psychological-personal deficit as the culprit; and social-learning
>
> theories…hypothesizes criminal conduct as the result of a learning experiences in
>
> interaction with biosocial and situational factors (p. 241)

In particular, social learning theory posits that both conforming and criminal behavior is

the result of the learning process relating to social structure and interactions with others

(Akers, 2000). More specifically, social learning theory explain criminal behaviors in

terms of personal characteristics such as values and attitudes for criminal behaviors

(Akers; see also, Andrews & Bonta, 2003; Morash 2009). Social learning variables such

as "differential association, differential reinforcement, definitions, imitation, and other

learning variables" (Akers, p. 82), can be considered as dynamic variables of risk

assessment (Andrews & Bonta, 2003).

Based on these perspectives, the authors developed a "Personal, Interpersonal,

and Community-Reinforcement perspective" on criminal conduct (Andrews & Bonta,

2003, p. 165) that led to the best validated risk factors for risk assessment: "antisocial

attitudes, antisocial associates, a history of antisocial behavior, antisocial personality

pattern, problematic circumstance at home (family/marital), problematic circumstance at

school or work, problematic leisure circumstance, and substance abuse" (p. 86).

Subsequently, these conceptual risk factors were materialized into 54 items of the LSI-R.

According to the LSI-R Manual (Andrews & Bonta, 2001), the LSI-R consists of

54 risk/need items under 10 subcomponents: criminal history, education/employment,

finances, family/marital, accommodations, leisure/recreation, friends/acquaintances,

alcohol/drug use, emotional/mental health, and attitudes/orientations. Each item is

answered with a "Yes or No," format or a "0 to 3" rating format[7], by utilizing an initial

semi-structured interview. The LSI-R yields the risk score ranging from 0 to 54. Also, the

LSI-R manual provides guideline to determine the risk level of an inmate from low to

high, according to the LSI-R scores.

In general, to date, the LSI-R is considered as one of the most popular and widely

used risk/needs assessment tools in the United States, Canada, Australia, the United

Kingdom and parts of Europe (Andrews & Bonta, 2003; Gendreau et al. 1996; Girard &

Wormith, 2004; Ogloff & Davis, 2004). It is referred to as a gender-neutral and culture-

responsive risk assessment inventory (Andrews & Bonta, 2003; Hollin & Palmer, 2003;

Reisig, Holtfreter, & Morash, 2006; Schlager & Simourd, 2007; Zinger, 2004).

Gender and Risk-Need Assessment

Gender Differences in Assessing Risk

By contrasting to social learning theory, feminist theory considers gender as an

underlying theme in understanding human social behaviors including crime (Morash,

2009). In particular, feminist criminologists have argued that gender always is connected

to the context of criminality as well as other social behaviors. Accordingly, they insist the

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[7] According to the LSI-R manual (Andrews & Bonta, 2001), 0 and 1 are coded as "1" because they mean an unsatisfactory situation for offenders, whereas 2 to 3 are coded as "0" because they are interpreted into a satisfactory situation.

importance of gender role in predicting the likelihood of re-offense. It is widely assumed that there exists a difference in risk levels according to gender. For example, Hannah-Moffat (2006) argued that "risk is gendered" (p.184; see also, Chan & Rigakos, 2002; Hannah-Moffat & Shaw, 2001), meaning that risk is expected to interact with gender (Andrews et al., 2006). Simply put, the substantial gender disproportion in the prison population also confirms the different risk levels for engaging in criminal activities by both genders.

Since risk is defined as the possibility of involvement in crime, the higher number of male inmates than female inmates illustrates the different levels of risk in terms of crime commission. In addition, female inmates are less likely to become involved in incidences of escape or institutional violence than male inmates (Austin, 2003; Austin et al., 1993; Hannah-Moffat & Shaw, 2001). In general, women are less dangerous than men both before committing crime and after committing crime. So, it is true that the feature of female offending is qualitatively and quantitatively different from male offending, even in the case of similar charges (Austin, 2003, Hannah-Moffat & Shaw, 2001; Van Voorhis & Presser, 2001; Van Voorhis et al., 2008). For example, correctional administrators from state and federal prisons stated that they do not consider female inmates as dangerous as male inmates regardless of their risk scores; moreover, female inmates with high risk scores are not more dangerous than female offenders with low risk scores (Van Voorhis & Presser, 2001). Also, their statement implies that the risk score can fail to distinguish risk levels without considering gender.

It is generally believed that the gender gap in crime has decreased, according to the Uniform Crime Reports arrest trends (Steffensmeier, Zhaon, Ackerman, Schwartz, &

Agha, 2006). Nonetheless, the research conducted by Steffensmeier et al. indicated that the gender gap should be explored through a comparison of the Uniform Crime Report and National Crime Victimization Survey. They explained that the gender gap was fairly small for misdemeanor assault; but larger for more serious violent crimes (aggravated assault and especially homicide and rape/sexual assault).

The fact that the gender gap is closing for misdemeanors has been over-generalized for female violent crimes. Further, the gender gap in interpersonal violence has remained very stable for the past several decades, regardless of the fluctuation in crime rates and social changes. Even with the increasing trend of crime committed by women, the data does not support "a systematic change in the violent-offending gender gap" (Steffensmeier et al., 2006, p. 90). Thereby, structural differences between male and female offenses may exist, especially for violent offenders, and if identified, they should be explained. Such differences should be reflected in classification practices. In fact, it is reasonable for feminists to argue that male-centered classification tools fail to explain unique factors in female criminality (Reisig et al., 2006).

As well as the gender disparity in crime rates, the big differences in violent crime rates also suggest that male offenders are more likely to exhibit higher risk levels than female counterparts. Considering the fact that 80% of female offenders had been convicted due to prostitution, commercialized vice, embezzlement, fraud, forgery, counterfeiting larceny/theft and running away (Bloom et al., 2003), levels of risk and threat to the community posed by female offenders cannot be expected to be the same as that of male offenders. Moreover, violent female offenders who committed murder/manslaughter, sexual assault, robbery and violent personal offense showed less

engagement in criminal behaviors than even nonviolent female offenders, because violent female offenders' crime was more likely to have resulted from a long history of victimization (Verona & Carbonell, 2000).

Notably, Lowenkamp, Holsinger, and Latessa (2001) found significant differences in risk scores between males and females who had experienced child abuse. As is commonly assumed, more female offenders had experienced child abuse than had male offenders in their samples, that is, 17% of the females and 9% of males among their participants. This research supports that there are differences between male and female criminality that affect risk assessment. Further research should be conducted with female offenders who have different criminal backgrounds and histories. Therefore, criminal history without understanding situational factors may have some limitations in assessing the risk levels of female violent offenders.

Given the unique experience of female offenders regarding criminal history, feminist criminologists tend to interpret female criminality as a result of repeated victimization, which is considered as "gendered pathways to crime" (Bloom et al., 2003; Daly, 1992; Hannah-Moffat & Shaw, 2001; Reisig et al., 2006). According to Morash (2006), theoretically, the concept of gendered pathways to crime is the perspective to understand women's crime by identifying the unique features of criminal behaviors of woman resulting from gender roles in social contexts. Given the situational factors of female crime such as victimization, risk prediction has some limitations to understanding female offenders especially with a history of victimization. Therefore, Morash insisted inappropriateness of risk prediction for female offenders who are classified into gendered pathways to crime.

Accordingly, feminist criminologists have criticized the lack of risk assessment instruments that differentiate between males and females (Belknap & Holsinger, 2006; Blanchette & Taylor, 2005; Burgess-Proctor, 2006; Farr, 2000; Hannah-Moffat & Shaw, 2001; Lowenkamp et al., 2001; Resig et al., 2006) since the theoretical paradigms for female offenders are totally different from those for male offenders (Morash, 2009). Although, consistently, several studies have demonstrated the validity of the LSI-R for predicting risk levels of female offenders, criticism has focused on the possible misclassification of female offenders due to a lack of understanding of female criminality (Lowenkamp et al., 2001).

Gender Differences in Assessing Needs

Many scholars and practitioners have consistently noted that gender-related experiences should be considered in the practice of risk-need assessment in the criminal justice system (Covington, 1998; Farr, 2000; Holtfreter & Morash, 2003; Holfreter et al., 2004). The need principle is related to identifying target factors for change to prevent re-offense (Dowden & Andrews, 1999). The importance of need principle in enhancing the effectiveness of rehabilitation for offenders raises the question of whether or not the needs identified for the male offender population can be generalized to the female offender population (Chesney-Lind, 1997; Dowden & Andrews, 1999; Van Voorhis et al., 2008).

Multiple studies have reported that female offenders' needs are different from males' (Coulson, Ilacqua, Nutbrown, Giulekas, & Cudjoe, 1996; Heilbrun et al., 2008; Holsinger et. al, 2003; Holtfreter et al., 2004; Lowenkamp et al., 2001; Palmer & Hollin, 2007; Van Voorhis & Presser, 2001). Although it is very fortunate that the risk-need-

responsivity principle is widely accepted as a fundamental theory in assessing offender risk and needs, it would be invalid without identifying need factors that can differentiate female inmates from their male counterparts.

Hannah-Moffat (2006) suggested that specific factors such as emotional problems, self-injurious behavior, suicide attempts and self esteem are more relevant for women's needs. Also, Koon, John, Morash, and Bynum (1997) claimed that female offenders have their unique needs such as childcare, pregnancy, and needs related to sexual or physical abuse history. Dowden and Andrews (1999), based on their meta-analytic review of studies on correctional interventions for female offenders, found that substance abuse, family variables, and basic education skills are the most promising factors for addressing criminogenic needs of female offenders.

Throughout a comprehensive review of the women's need literature, multiple research studies enumerated gender-specific needs as follows: anxiety, depression, psychosis, childhood abuse, parenting issues, economic marginalization, low self-esteem, unsupportive relationships, and the confluence of trauma and substance abuse (Belknap & Holsinger, 2006; Blanchette, 2004; Blanchette & Brown, 2006; Brennan, 1998; Brennan & Austin, 1997; Farr, 2000; Heilbrun et al., 2008; Holtfreter, & Morash, 2003; Taylor & Blanchette, 2009; Van Voorhis, 2008;). Such needs can be improved or aggravated according to correctional interventions (Van Voorhis et al., 2008).

More specifically, multiple studies about female inmates highlighted the issue of parenting (Heilbrun et al., 2008). The number of incarcerated mothers has dramatically increased by 122 % from 29,500 in 1991 to 65,600 in 2007, whereas the number of incarcerated fathers has increased by 76% from 423,000 in 1991 to 744,200 in 2007

(Schirmer, Nellis, & Mauer, 2009). Parenting is an imminent problem for incarcerated mothers because only 37% of the children of incarcerated mothers live with their fathers, and the rest of children are at risk without appropriate guardianship. However, in the case of children of incarcerated fathers, a greater number of children live with their mothers (Schirmer et al., 2009). The primary concern of incarcerated mothers is child care, which hinders their prison adjustment. Depending on who is incarcerated (mother or father) there is a differential impact on children's lives. This supports that the child care need of inmate mothers must be considered.

Furthermore, Bonta, Pang, & Wallace-Capretta (1995) found that incarcerated mothers, who had the entire responsibility for their children, had a higher probability of recidivism than women raising children with other family members including partners. Parental stress resulting from limited child contacts, which caused concerns about the loss of child custody, was associated with higher levels of mental illness (Van Voorhis et al., 2008). Consequently, the way to deal with a series of parenting issues can affect the female offenders' adjustment in prison and recidivism after release. Parenting seems to be a primary criminogenic need to be considered for female offenders. Yet, most of the risk-need assessment inventories have not paid attention to it.

Correctional agencies have started to consider the special needs of women offenders since the mid-1990s (Hannah-Moffat, 2006). Nevertheless, some researchers have continued to insist that there are no meaningful differences in needs between genders, arguing that the risk-need-responsivity principle can apply for correctional interventions regardless of gender (Andrews & Bonta, 2003; Heilbrun et al., 2008). It is more convincing that some criminogenic needs can apply for both genders but others can

be gender specific (Hollin & Palmer, 2006a; Palmer & Hollin, 2007), but most states

have assessed male and female offenders with the same risk assessment instrument

(Austin & McGinnis, 2004; Van Voorhis & Presser, 2001).

Despite the recognition of gender differences in need assessment, the empirical

research to address gender-specific criminogenic needs is sparse (Heilbrun et al., 2008).

Women offenders are considered 'a more troubled group' than male offenders because of

their higher rates of mental illness, relationship issues, and physical and sexual abuse

histories than that of male offenders (Van Voorhis & Presser, 2001). As a result, further

research should be required to identify 'gender-specific' need factors, in order to exactly

match offenders' needs and programs. Currently, psychological factors, especially,

emotional factors (Verona & Carbonell, 2000), are emerging as promising factors that are

relevant to reducing further offenses of female offenders. Research should focus

primarily on those factors.

<div align="center">Offense Type and Risk Assessment</div>

As noted previously, property offenders had a higher recidivism rate that violent

crime offenders such as those who commit murders or aggravated assaults (PADOC,

2006). Risk assessment is a prediction about general recidivism[8], which is measured by

violent recidivism and non-violent recidivism (Andrews & Bonta, 2003; Harris et al.,

2002; Simourd, 2004). An inmates' offense type and his or her criminal history are

certainly related to future behaviors, and for this reason, most risk assessment inventories

as well as the LSI-R include a criminal history. Consequently, the LSI-R has the

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[8] Recidivism is commonly defined by general recidivism and violent recidivism. Andrews & Bonta (2003) used the terms of "general recidivism," meaning any kind of conviction and "violent recidivism" referring to reconviction of violent crimes (p. 247).

questions about offender's criminal history, asking the number of offenses committed. Although the LSI-R considers the number of offenses, it does not take into account the seriousness of offense type in predicting offender's future risk.

Several studies have consistently reported a relationship between offense type and risk levels. Some subscales of the LSI-R are more pertinent to predicting recidivism than other LSI-R subscales according to offense type (Washington State Institute for Public Policy, 2003). Cunningham, Sorensen, & Reidy (2005), as an example, assessed prison violence risk among maximum security inmates, and they found that inmates who commit property offenses are less likely to be involved in institutional misconduct than violent offenders. The study conducted by the Washington State Institute for Public Policy (2003) found the different predictors among ten LSI-R subcomponents depending on violent felony recidivism and nonviolent felony recidivism. This research also identified statistically significant items among the 54 items in the LSI-R, in which only 28 items are statistically significant for violent felony recidivism, whereas 13 items are statistically significant for other felony recidivism.

Harris et al. (2002) confirmed that a clinical assessment tool such as Violence Risk Appraisal Guide (VRAG), an instrument developed to predict "violent recidivism," is valid to predict violent recidivism in the case of violent offenders with mental problems. Mills, Jones, and Kroner (2005) similarly found that LSI-R scores were significantly associated with general recidivism including non-violent recidivism, whereas the VRAG scores were significantly related to violent recidivism. Accordingly, the VRAG can be considered as an effective tool in assessing violent recidivism

especially for violent offenders because it includes the measurement of violent offenders' special needs.

Holtfreter et al. (2004) found the LSI-R did not appropriately assess the risk of women offenders who committed crime caused by poverty. They concluded that poverty itself is a strong predictor of recidivism for female felony offenders. More specifically, Loza and Simourd (1994) reported that violent inmates indicate different patterns of ciminogenic needs compared to nonviolent inmates. Hollin & Palmer (2003) also supported Loza and Simourd's research result by testing the LSI-R with violent and non-violent offenders in England by confirming different needs in their study samples, signifying that different predictors need to be identified according to offense type.

In conclusion, several studies imply that offense type would be a promising predictor to be considered in offenders' need assessment by indicating a different predictive validity depending on offense type. Research is needed to develop better classification tools that can improve the management of prisoners' needs based on their offense types.

<center>Race and Risk Assessment</center>

Besides gender and offense type, race also has a direct influence on risk-need assessment relating to risk vulnerability (Chan & Rigakos, 2002). Yet, considering the development process of risk assessment inventories, most modern risk-need assessment tools have appeared to focus more on white male prisoners, disregarding racial differences, which result in misclassification of minorities related to issues of prison maladjustment and reintegration into the community (Hannah-Moffat & Shaw, 2001). Whereas Hannah-Moffat (2006) pointed out that risk is "racialized" (p. 184), recently

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Andrews and Dowden (2006) reaffirmed that risk assessment studies have primarily been conducted with male Caucasian offenders during the past decade. Although multiple studies have supported the LSI-R as a valid risk assessment regardless of race (Simourd, 2006), there has consistently raised an issue concerning different risk factors by race (Holsinger et al., 2003). Since race-specialized risk assessment tools are not developed or tested yet, no one can assure the validity of the LSI-R beyond races.

Whiteacre's (2006) study explored the classification errors based on race by comparing LSI-R scores, program outcomes and institutional misconducts. He reported the higher possibility of over-classification for African American prisoners than Caucasians and Hispanics. By contrast, Hispanic and Caucasians were more likely to be under-classified than African Americans. His findings force all correctional facilities to validate their own classification instruments with various racial groups. He also suggested that throughout such an effort, correctional facilities can develop the appropriate cutoff score, the appropriate outcome measure, and promising predictors for each racial group. As a result, the similar risk scores can mean different risk levels depending on racial characteristics.

With regard to female offenders, Hannah-Moffat and Shaw (2001) reported female offenders are very heterogeneous in terms of racial and cultural background. Within the same gender, race or ethnicity should be considered in predicting offenders' risk. For example, a comparison study conducted by Blanchette, Verbrugge, and Wichmann (2002) found different risk-need factors for aboriginal woman and non-aboriginal women. They also found that federally-sentenced aboriginal women are more likely to be placed at higher levels of security than federally-sentenced non-aboriginal

women. A similar result was found between aboriginal males and non-aboriginal males, which confirmed higher security for aboriginal males than non-aboriginal males (Luciani, Motiuk, & Nafekh, 1996).

In particular, the comparison study between Native American offenders and non-Native American offenders revealed that Native Americans had a higher level of criminogenic risk than non-Native Americans, indicating higher scores on substance abuse problems (Holsinger et al., 2003). More importantly, "ethnicity" was a statistically significant predictor in their linear regression model. This research confirmed a widespread concern about the validity of the LSI-R, when it applied to minority populations.

In considering recidivism rates, race showed that African Americans have higher recidivism rates than Whites. Leagan and Levin (2002) found that the recidivism rate of African Americans within three years is 16% higher than that of Whites. Also, Petersilia (2003) considered race as the most promising factor in predicting recidivism. In particular, Resig, Bales, Hay, and Wang's study (2007) analyzed the impact of racial inequality on recidivism for released Black prisoners and reported racial inequality was significantly associated with the recidivism rate. Considering the fact that the LSI-R score is positively associated with the recidivism, the LSI-R should reflect the different impact of race on recidivism. Therefore, it is meaningful to test the validity of the LSI-R for various racial groups as a recidivism measurement tool.

Accordingly, there is little evidence to indicate that the LSI-R is capable of bias-free prediction of criminal behavior when used with different races (Coulson et al., 1996). Regrettably, very little is known about the racial impact on risk assessment. Race needs

to be considered as a critical factor in assessing offenders' risk and needs. It is natural that there would be an increased concern to develop classification systems suitable for different races reflecting cultural diversity.

Research with the LSI-R

Since the LSI-R of third generation instruments is one of the most widely used risk assessment tools, multiple studies have been conducted to test its reliability and validity with various offender populations including male inmates (Heilbrun et al., 2008; Hollin & Palmer, 2003, 2006b; Hollin, Palmer, & Clark, 2003; Holsinger et al., 2003; Lowenkamp et al, in press; Kroner & Mills, 2001; Loza & Simourd, 1996, 2006), female inmates (Coulson et al., 1996; Folsom & Atkinson, 2007; Holtfreter et al., 2004; Lowenkamp et al., 2001; Palmer & Hollin, 2007, Reisig et al., 2006), probationers & parolees (Austin, Coleman, Peyton, & Johnson, 2003; O'Keefe et al, 1998), and mentally disordered, sexual offenders, and male and female inmates (Andrews & Bonta, 2003).

In general, research has shown a consistent correlation between the LSI-R score and general/violent recidivism in several meta-analytic presentations (Andrews & Bonta, 2003; Gendreau et al., 2002; Gendreau et al., 1996). Also, Andrews and Bonta (2003) asserted that the LSI-R continuously showed satisfied reliability when assessed using both inter-rater and test-retest methods. Supporters for the LSI-R have argued that the LSI-R is gender neutral and it can be applied equally to all racial, ethnic, and social class groups (Andrews & Bonta, 2003; Resig et al., 2006; Schlager & Simourd, 2007; Simourd, 2006).

The following section explores studies with the LSI-R including other versions such as the LSI and LSI-OR. The discussion continues according to the research subjects

under the relevant subheadings: Meta-analytic reviews; Research with males; Research with females[9]; Research with exceptional populations; and Research with different races, based on studies conducted since the 1990s.

Meta-Analyses

Gendreau et al. (1996) conducted a meta-analysis of selected studies published between January 1970 and June 1994 in order to identify predictors for recidivism. They eventually identified 131 studies and classified eight predictor domains divided into dynamic and static factors. After identifying these predictors, they computed Pearson product-moment correlation coefficients with significance testing. They reported that the LSI-R score showed the highest correlations with recidivism (r=.35) among risk assessment inventories studied, but it was not significantly greater than other inventories. They concluded that the LSI-R was a valid predictive inventory, making it one of the most useful actuarial measures. Their research also found that criminal history, history of antisocial behaviors, social achievements, age/gender factors, companions, substance abuse and family features are the strongest predictor domains for recidivism.

Furthermore, Gendreau and his colleagues (2002) recently conducted another meta-analysis and confirmed that the LSI-R is more valid in predicting general and violence recidivism than the Psychopathy Checklist-Revised (PCL-R). They summarized 30 predictive studies in which LSI-R scores were significantly correlated with recidivism. Hemphill and Hare (2004) argued, however, that the PCL-R was designed to measure a psychological construct, while the LSI-R is a specialized tool for risk assessment for recidivism. They concluded that direct comparison of the predictive validity of the two

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[9] The subheading, "Research with females" includes comparison studies between male and female risk scores as well as the studies with female participants as an independent sample.

instruments is not appropriate, because both instruments were designed for different purposes.

Research with Male Offenders

Loza and Simourd's study (1994) was conducted with male federal inmates in order to determine the validity of the LSI[10] for prison inmates because the LSI was originally designed for probationers. They also examined convergent validity with two other instruments: PCL-R and General Statistical Information on Recidivism (GSIR). Their study supported the use of the LSI as a valid instrument for inmate populations in predicting offender risk. They also compared the LSI scores of violent and non-violent offenders. As hypothesized, violent offenders had significantly higher mean scores than non-violent offenders on the LSI mean score, 27.44 vs. 23.86 respectively. In particular, violent offenders showed higher scores on family/marital, leisure/recreation, alcohol/drug, and emotional/personal subscales.

Kroner and Mills (2001) examined the accuracy of five risk assessment tools including the LSI-R, the PCL-R, the Lifestyle Criminality Screening Form (hereafter, LCSF), the HCR-20, and the VRAG, with 97 male inmates in the province of Ontario, Canada. It confirmed the strongest correlation between the LSI-R scores and total convictions, violent convictions and revocations, while the VRAG had the strongest correlation with the nonviolent convictions. Since the VRAG measures violent recidivism of violent offenders, the result does not support the utility of the VRAG. Confirming the different predictive validity according to the inventory and violence types, this study does imply the necessity of appropriate predictive factors according to types of violent offense.

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[10] The Level of Service Inventory is the first version of LSI series (Andrews & Bonta, 2003)

Recently, Hollin and Palmer (2003) compared the LSI-R scores of violent[11]

(n=132) and non-violent prisoners (n=134) modeling Loza and Simourd's study (1994).

They found a statistically significant difference on the LSI-R scores between violent

offenders (29.91) and non-violent offenders (19.23), and throughout the discriminate

function analysis, they reported salient criminogenic factors for violent male offenders

such as education & employment, criminal history, alcohol/drug, and attitude/orientation.

It can be interpreted that violent offenders are more vulnerable on those factors, so if they

have problems with those areas, they could be more involved in future criminal behaviors.

Accordingly, this research provides a rationale for why risk assessment tools should take

into account violent offense types.

In particular, Hollin et al.'s study (2003) provided relevant information for the

proposed study because it focused on a need analysis. They examined the LSI-R scores of

294 prisoners at six correctional institutions in England at the point of admission and at

the time of release into the community. The total mean of the LSI-R scores of this study

was 22.29, which was lower than the Canadian study (i.e., 26.20, Loza & Simourd, 1994).

This study went on to report that the risk scores on dynamic factors among the LSI-R 10

subscales had changed at the time of offender release, while static factors remained at the

same levels. Regarding need factors, they reported that the Canadian inmates showed

higher scores on criminal history, financial, accommodation, companions, alcohol/drug,

emotional/personal subscales. They noted, however, that the differences may result from

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[11] While Loza and Simourd defined a violent group including major offenses (murder, manslaughter, assault, kidnapping, forcible confinement) and serious offenses (robbery, sexual offenses) and a non-violent group including moderately serious offenses (fraud, criminal acts committed without violence) and minor offenses (theft, mischief, property offenses), Hollin & Palmer categorized a violent group for those who were charged with robbery, rape, manslaughter and a non-violent group for those who were convicted of offenses such as burglary, theft, forgery and criminal damage.

the different composition of the two samples in terms of length of sentence and violent offense types.

Furthermore, Simourd (2004) tested the LSI-R with long-term incarcerated male offenders, in terms of predictive validity, with a 15 month follow-up period. Most of this study's participants consisted of inmates who were charged with violent offenses. The LSI-R total scores were significantly related to general (r=.44) and violent (r=.26) recidivism. This result can be interpreted that the LSI-R is a more valid in predicting general recidivism than violent recidivism. Recidivists showed significantly higher scores on criminal history, education/employment, financial, family/marital, leisure/recreation, emotional/personal and attitude/orientation. Recent research conducted by Hollin and Palmer (2006b) provided further evidence about the predictive validity of the LSI-R score in terms of reconviction for English prisoners. According to their research, the reconvicted offenders have significantly higher LSI-R scores than those who did not re-offend. Even with their strong evidence, they indicated that further research would be needed to explore the relationship among need, type of offense, and recidivism.

Besides the studies with male inmates, O'Keefe, Klebe, and Hromas (1998) evaluated the validity of the LSI with offenders under transitional community correction (n=85) and parole (n=172). Their results showed the limited utility of the LSI for male offenders, reporting the predictive validity for parolees but not for the community sample. They suggested that the utility of the LSI should be investigated with various offender groups, especially for assessing offenders' needs.

The Pennsylvania Board of Probation and Parole examined the inter-rater reliability[12] and validity of the LSI-R (Austin et al., 2003). For the reliability test, they administered the LSI-R to 120 prisoners, with a two-month follow-up period. They reported the disparity of LSI-R scores by administrators and concluded that this disparity can be narrowed by developing a training strategy for administrators. They also studied the validity of the LSI-R with a sample of 1,006 male prisoners who were released on parole from nine facilities. These results offered support that the LSI-R score was a valid predictor of parole violation and recidivism. These LSI-R scores efficiently distinguished the level of risk among offenders: 3% in the low risk group, 51% in the medium risk group and 58% in the high risk offender group were involved in re-offending. Also, they found that among the 54 items of the LSI-R inventory, only 11 items had a statistical correlation with recidivism. Accordingly, they suggested that a condensed instrument can be utilized to predict recidivism, rather than the full version of the LSI-R.

As shown above, most of the LSI-R research with male inmates supports that the LSI-R is the valid and reliable risk assessment tool for male inmates beyond nationality and other factors. Nonetheless, the researchers have recognized that the generalization of the LSI-R to various types of offenders has to be very prudent unless it does rule out other confounding factors related to different sample structures.

Research with Female Offenders

The research with female offenders has been conducted on three levels: to find the risk score difference by gender; to test the predictive validity of the LSI-R by gender; to identify gender-specific criminogenic factors. The majority of the research confirmed the

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[12] Inter-rater reliability involves whether two persons computing the LSI-R score for the same individual reach the same rating, while intra-rater reliability refers to whether a single rater scoring the LSI-R for an inmate will reach the same rating on repeated application (Austin et al., 2003, p. 2).

higher scores on the LSI-R for male offenders than female counterparts and assumed the predictive validity of the LSI-R for both genders. However, they identified different criminogenic factors for both genders.

Coulson et al. (1996) investigated the LSI's validity in order to determine its utility in predicting female offenders' criminal behavior. They found that there were significant differences in recidivism probability between the low risk and high risk LSI groups as identified by LSI scores. The average LSI score of female samples in this study was 15.5 out of 54, while the average LSI scores for male offenders in other research ranged from 20.9 to 25.1 out of 54 (Bonta & Motiuk, 1987, 1990). The authors assumed the mean differences between male and female offenders resulted from unique criminality and different sentencing procedures/practices by gender.

Lowenkamp et al. (2001), however, did not find statistically significant differences in LSI-R scores between male (n=317, 25.12) and female (n=125, 25.05) offender groups, but LSI-R score differences were recognized between males and females who had child abuse experiences. Although the research failed to support the correlation between child abuse and recidivism for either men or women in this sample, they indicated that childhood abuse may be one of the most notable and potential risk factors for female offenders. They concluded the LSI-R as the valid risk assessment inventory for both males and females by finding a correlation between the LSI-R scores, time at risk, and recidivism.

Recent research also supported the predictive validity of the LSI-R for a female offender sample of 100 who served in prisons more than two years in Canada (Folsom & Atkinson, 2007). As supported by multiple studies, according to their risk levels,

significant differences were found in the recidivism rate. Still, even with the relatively

long-term sentences of the participants in this study, the LSI-R mean score was 18 out of

54. It implies generally lower risk levels of female offenders, compared to male offenders

(Van Voorhis et al., 2008).

Holsinger et al.'s study (2003) tested gender and racial[13] effects on the LSI-R

score. In a comparison of gender differences on the LSI-R, the male offender group

(23.59) reported significantly higher scores than the female offender group (20.64).

Interestingly, the female offenders showed more vulnerability on financial, family/marital,

and emotional/personal subscales, even with the lower scores than that of male

counterparts. According to their research findings, they highlighted not only the gender

differences but also the necessity to modify current correctional practices.

Similarly, the study performed by Holtfreter et al. (2004) was intended to identify

unique criminogenic factors to explain women's criminality. They constructed the

logistic regression model with age, race, education, poverty, LSI-R score, and thus,

revealed that poverty explained 55% of variances in re-arrest and 57% in violence.

Therefore, the risk score could not appropriately capture the risk and needs of various

types of offenders, such as the economic marginality of women offenders. Accordingly,

this study is open to a possibility of extrapolating new variables other than LSI-R to

assess women's risk and needs, underscoring poverty as a very plausible variable in

predicting recidivism for female offenders. The authors recommended that the LSI-R

should be reconsidered and modified to reflect the women offenders' economic

marginality. This research supported the criticism of feminist criminologists that the same

sets of propositions cannot explain both male and female criminality (Belknap &

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[13] Racial effect will be discussed under the subheading of "Research with Different Races".

Holsinger, 2006; Blanchette & Taylor, 2005; Bloom et al., 2003; Burgess-Proctor, 2006; Reisig et al., 2006).

In the same context, there is another study to support the feminist critique of the LSI-R, centering on skepticism regarding the validity of the LSI-R for female offenders and special populations. Using Daly's pathway (1992) to crime framework, Reisig et al. (2006) conducted research about battered women, harmed and harming women, street women, drug-related female offenders and economically motivated female offenders. They found that the LSI-R over-classified for harmed and harming women and under-classified for drug related women, although the LSI-R was valid in predicting recidivism for economically motivated women. They concluded that the use of the LSI-R scores to measure risk is empirically justified for general female offenders, but not for women following gendered pathways to crime. Also, they asserted that Daly's pathways frame is a very promising perspective to understand idiosyncratic factors of women's crime, arguing that male-centered risk assessment inventories easily fail to capture critical factors that lead women into crime.

More specifically, Hollin and Palmer (2006a) developed the discourse by identifying gender-neutral and gender-specific needs in their recent research, arguing that, of 10 LSI-R subscales, Finance, Accommodation, and Education/Employment may be common factors regardless of gender, but a personal/emotional factor may be specifically considered to identify women's needs. They also stated that the magnitude of the needs would be different by gender even with gender-neutral factors.

Developing their discourse, Palmer and Hollin's research (2007) explored the predictive validity of the LSI-R for a female prisoner sample (n=150) in England. They

reported similar results with Lowenkamp et al. (2001) by assessing a mean total of LSI-R

score of 23.00 in the study, which compared to 25.05 in Lowenkamp et al.' study. Also,

they supported the predictive validity of the LSI-R for female offenders. They, however,

reported salient criminogenic factors for women: Accommodation, Companions,

Family/Marital, Alcohol/drug, Emotional/Personal subscales, and they argued that it is

necessary to develop accurate risk assessment tools to meet women's needs, in order to

provide appropriate interventions in correctional facilities.

Similarly, Heilbrun et al.'s research (2008) with female (n=882) and male

(n=1,435) inmates showed that female offenders were more likely to be in a weak

position on financial, companion, family/marital status, accommodation, alcohol/drug

subscales, while male offenders consistently showed a higher risk level on Criminal

History.

The most recent research conducted by Lowenkamp, Lovins, and Latessa (in

press) administered the LSI-R to male (n=369) and female (n=116) offenders under

community supervision to assess the predictive validity of the LSI-R. Their finding was

consistent with existing research on LSI-R validity in predicting recidivism for male and

female offenders, indicating that the correlations between the composite male's LSI-R

score and arrest (r=.37) were slightly higher than the correlation between the composite

female's LSI-R score and arrest (r=.34).

Recently, the Pennsylvania Department of Corrections conducted a validity study

of the LSI-R for all new admissions at two central diagnostic centers: SCI-Camp Hill for

male offenders and SCI-Muncy for female offenders (Simourd, 2006). This research

compared the LSI-R scores of male inmates (n=964) and female inmates (n=70) with the

investigation of the relationship between such scores and recidivism or institutional misconducts. Although the study concluded that the LSI-R is a suitable inventory for both genders, demonstrating a two-point higher average on the LSI-R for males, it did not support the validity in recidivism for both genders.

Informed by this overview of the studies with male and female offenders, it is imperative that research identify gender neutral and gender-specific factors for both genders. In general, women's risk and need factors have been substantially affected by situational factors such as financial, companion and family marital status as well as an emotional factor, whereas the male has yielded higher scores on LSI-R mainly due to criminal history. Such results have clear implications for the needs of the development of gender-specific assessment tools for female offenders. In addition, the empirical research should be accumulated to improve risk-need assessment for female offenders, although criminogenic factors identified in studies may vary study by study.

Research with Different Races

There are a few studies of the LSI-R to apply different racial groups. Most of such studies have focused on Caucasian males, causing doubt of the efficacy of the LSI-R for non-Caucasian populations (Bloom et al., 2003; Whiteacre, 2007). Holsinger et al.'s (2003) study compared racial differences in the LSI-R total score and ten subscales as well as gender differences as described previously. Participants of this study included 189 Native American inmates and 1,153 Non-Native American inmates. Native Americans (28.03) showed higher scores on the total LSI-R mean than Non-native Americans (22.22). In particular, Native Americans were substantially susceptible to the following subscales of the LSI-R: criminal history, education/employment, financial, family/marital,

accommodation, and alcohol/drug. The authors concluded the modification of the standardized risk-need assessment inventories to capture the needs of this minority population.

Simourd (2006) studied racial differences in LSI-R scores along with a comparison of scores for male and female offenders. The sample for this study consisted of males (n=964) and females (n=70), represented by Caucasian (45.1%), African American (36.0%) and Hispanic (12.0%). Simourd reported that the mean of the LSI-R scores was essentially identical across the different racial groups. Accordingly, this research supported the validity of the LSI-R regardless of the offender's race.

Recently, Schlager and Simourd (2007) explored the psychometric properties and validity of the LSI-R on a sample of African American (n=333) and Hispanic (n=112) offenders from two halfway houses and one day reporting center in New Jersey, where community correctional programs are administered. The authors found great similarity in the LSI-R scores for both ethnic groups, that is, the LSI-R means for Hispanic and African American offenders were 27.6 and 28.1 respectively. The authors recommended further study of the use of the LSI-R with minority offender populations.

Whiteacre (2006) examined the odds of over-classification (false positive) and under-classification (false negative) in assessing risk according to races. He found that African Americans were more likely to be over-classified for those who were categorized into low and high risk levels than Hispanics or Caucasians in the same risk levels. In other words, Hispanic and Caucasians were more likely to be under-classified at the same risk level. The most recent research conducted by Fass et al. (2008) also supported these findings. They, however, revealed that in their comparison between LSI-R and

COMPAS[14], African Americans were more likely to be under-classified for COMPAS but Caucasians were more likely under-classified for criminogenic variables. Therefore, the odds of misclassification may vary depending on the risk assessment tools and races.

Even with the supportive findings about the validity of the LSI-R, most researchers have indicated a concern about generalization beyond gender and race and strongly suggested further examination of the risk and need factors that are relevant to specific populations in the criminal justice system.

LSI-R Research with Exceptional Populations

Research regarding the LSI-R has been conducted with various offender groups. For example, Simourd and Malcolm (1998) examined the discriminate validity of the LSI-R by comparing different sexual offender groups classified by the characteristics of victims. They administered the LSI-R and the PCL-R with federally incarcerated sexual offenders at an intake assessment for prison and placement in a reception center for treatment. Significant differences were reported among the three offender groups: sexual offenders against adult female-victims (LSI-R score=27.34); extra-familial child molesters (LSI-R score=26.52); and familial child molesters (LSI-R score=20.15). For the first group, criminal history, accommodation, companions, and attitude/orientations subcomponents of the LSI-R are salient factors, whereas extra-familial child molesters showed higher scores on education/employment as well. Hence, this research reported that there are some different criminogenic factors identified even within sexual offenders, so correctional interventions are required to provide them with special treatment programs according to the types of sexual offenders.

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[14] COMPAS stands for the Correctional Offender Management Profiling for Alternative Sanctions as explained previously. It is one of the fourth generation risk assessment inventories (Andrews et al., 2006). This study refers to the first study to test the validity of the COMPAS, according to authors.

Recently, Kelly and Welsh (2008) explored the predictive validity of the LSI-R with drug-involved male offenders. They confirmed that LSI-R total scores were consistent and valid predictors of reconviction for drug-related offenders. As expected, they reported the risk level increased when drug and alcohol problems are more serious, and as a consequence, the chance of re-incarceration also increases. Other than criminogenic factors, the alcohol/drug subscale is the most promising factor to predict recidivism of drug offenders.

To the contrary, Girard and Wormith's study (2004) did not support the predictive validity of the LSI-OR[15] for various offender groups: sex offenders, domestic violence offenders and offenders with mental health problems, with a total sample of 454 inmates and 176 probationers. In the comparison of the LSI-OR scores between sex offender group (19.61) and non-sex offender group (20.19), they found no statistically significant difference in risk scores and recidivism. In addition, because the domestic offender group (21.44) showed higher scores on the LSI-OR than the non-domestic offender group (19.77), the former was more likely to involve recidivism, but both groups did not yield any difference in recidivism. In the case of comparison between offenders with mental problems and offenders with no mental problems, the same result was obtained. As a result, the predictive validity of the LSI-OR varied according to violent offense type.

In sum, the validity of the LSI-R has been generally supported by testing with different prison populations. Based on such empirical results, Andrews and Bonta (2002) have consistently argued that the LSI-R is the gender-neutral and culture-responsive risk assessment inventory. Nevertheless, there are still concerns about the validity of the LSI-R because of the paucity of the research with minority populations in the correctional

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[15] LSI-OR is one of subsequent versions of the LSI-R (Andrews & Bonta, 2003).

system. Hence, there would be great value in research to test its validity by gender, offense type and race, as this research proposes. Table 5 presents a summary of the research introduced in this chapter.

Summary

Historically, risk assessment inventories have developed from clinical to actuarial assessment, from static to dynamic or criminogenic factors, and from security-based to offender need-based assessment, represented by four generations. Recent risk inventories were historically developed based on various criminological theories. The evolution of risk assessment inventories was described in detail. Even with the elaboration of risk assessment, the reliability and validity of such risk assessment tools are still the main concern. To rule out reliability and validity threats, risk assessment and classification systems should be drawn from theoretical propositions and empirical research for a future generation (S. D. Gottfredson, 1987).

The importance of gender, offense type, and race in assessing risk and needs was discussed in detail, which provided the rationale for the proposed study. In fact, a significant amount of effort has been devoted to the development of risk assessment tools. Most of the validated research, however, has focused on male offenders, usually ignoring gender differences in classification practices. It is recognized that most early classification systems were intended to control and manage a white male prison population (Hannah-Moffat & Shaw, 2001).

Finally, established studies about LSI-R with various correctional populations were reviewed comprehensively by gender, offense type and race. Most of existing studies supported the validity of the LSI-R but the magnitude of validity of the LSI-R

was different depending on the subjects. The scholars in this field agreed with the idea that female inmates should be assessed with suitable tools separately from those used for male prisoners. Also, race would be another plausible predictor in assessing offenders' risk and needs.

The next chapter describes the research design and methodology of the study.

Table 5

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Meta Analytic Reviews							
Gendreau et al. (1996, USA)	Compared predictive validity of risk assessment inventories	Meta-analysis (131 studies)	More than 6 months	One-way ANOVAs; Student-Newman-Keuls multiple comparison test	(1) Age/gender/race (2) Criminal history (3) Criminogenic needs (4) Family factors (5) Intellectual functions (6) Personal distress (7) SES (8) Social achievement (9) Recidivism	Confirm highest correlation between the LSI-R and recidivism (r=.35)	
Gendreau et al. (2002, USA)	Examined the predictive validity of the PCL-R & LSI-R	Meta-analysis (57 studies)	NA	Correlation; Fail-safe analysis	(1) age/gender/race (2) offender risk level (3) risk measure (4) length of follow-up (5) Recidivism (General/violent)	LSI-R (r=.39) higher correlation with recidivism than PCL-R (r=.28)	
Research with Male Inmates							
Loza & Simourd (1994, Canada)	Examined psychometric properties of the LSI and convergent validity with PCL-R & GSIR	161 male Inmates	None	Internal consistency; X^2- Test; Factor analysis	(1) LSI-R total score (2) LSI-R subcomponent score (3) Violence types (4) PCL-R & GSIR scores	Support reliability & internal consistency (Cronbach α =.81) & convergent validity LSI-R=26.20; Two factor loading	Violent Offender; Family/Marital, Leisure/Recreation, Alcohol/Drug, Emotional/Personal
O'Keefe et al. (1998, USA)	Evaluated the validity of the LSI	172 parolees and 85 in transitional community correction resident	1 year	Test-Retest reliability; Correlation; T-test; ANOVA	(1) LSI (2) Wisconsin classification (3) Recidivism : Compliance rating scale, Reincarceration	Parolee: 23.7 (T1) 23.9 (T2) Community sample: 23.7 (T1) 17.2 (T2) Valid for parolees not community sample	NA

Table 5 Continued

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Kroner & Mills (2001, Canada)	Compared predictive accuracy of 5 risk assessment tools	97 violent male inmates (LSI-R; 25.5)	8 months for institutional misconduct Not specific for reconviction	Correlation; Receiver operating characteristics(ROCs) Area Under Curve (AUC)	(1) LSI-R & Subscales (2) PCL-R (3) HCR-20 (4) VRAG (5) LCSF (6) minor & major institutional misconducts (7) Recidivism: Reconviction, Revocation	Intraclass correlation : .94 LSI-R valid in predicting total conviction & violent conviction (r=.34) but not for institutional misconduct; VRAG valid in predicting non-violent conviction (r=.43)	NA
Hollin & Palmer (2003, UK)	Profiling violent & non-violent prisoners	251 male inmates (Violent =132, Nonviolent =134)	N/A	ANOVA; Discriminant function Analysis; Univariate Analysis; Multivariate Analysis	(1) Violence types (2) LSI-R score & subscales	Significant differences between violent (LSI-R=28.91) and nonviolent group (19.23)	Violent offenders: Criminal history, Education & employment, Companions, Alcohol & Drug
Hollin, Palmer, & Clark (2003, UK)	Testing the change of LSI-R scores and Comparing it with Canadian inmates'	294 male inmates (151 inmates for Retest)	N/A	Correlation; T-Test; Factor Analysis	(1) LSI-R score & subscales	Support the reliability for male inmates in England (LSI-R: 22.29)	Canadian Offender group: Criminal history, Financial, accommodation, companions, alcohol/drug, emotional/personal
Austin et al. (2003, PA)	Tested reliability and validity of the LSI-R & condensed version	1006 male parolees	12 months	Frequency	(1) LSI-R score & subscales (2) Recidivism: arrests, detentions, absconders, reincarceration	Consistent inter-rater reliability; Different recidivism rate according to risk band	NA

Table 5 Continued

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Simourd (2004, Canada)	Tested predictive validity for male inmates	129 long-term incarcerated male inmates (LSI-R; 31.9)	15 months	Coefficient alpha; Correlation; T-Test	(1) LSI-R scores & subscale (2) Recidivism: rearrest, violence rearrest, reconviction, reincarceration, supervision violence	Coefficient α =.82 Significant correlation between LSI-R scores and general (r=.44) & violent (r=.26) recidivism	Long-incarcerated violent offenders: Criminal history, education/employment, financial, family/marital, leisure/recreation, emotional/personal, attitude/orientation
Hollin & Palmer (2006b, UK)		294 male prisoners	17 days – 1172 days	Univariate analysis; Correlation; Sequential logistic regression; Sequential Cox regression survival analysis	(1) LSI-R (2) Amplified LSI-R (3) Reconviction	Reconvicted;25.16 Not reconvicted;19.80	Reconvicted offenders: Criminal history, education/Employment, Family, Companion
Research with Female Offenders							
Coulson et al. (1996, Canada)	Examined LSI's psychometric properties and predictive valdity	526 female inmates	39 months	Reliability test; correlation	(1) LSI (2) Recidivism: reconviction, parole failure, halfway house failure	Coefficient α = .90 Point-biserial correlation=.51 for recidivism, .53 for parole failure, .45 for halfway house failure; LSI; 15.5	NA
Lowenkamp et al. (2001, USA)	Investigated the validity of the LSI-R for both female & male; the relationship among childhood abuse, LSI-R & recidivism	442 felony offenders (male=317, Female =125)	1.6 years	Correlation; X^2 analysis; Logistic regression	(1) LSI-R (2) Childhood abuse (3) Age (4) Race (5) Time at risk (6) Program completion (7) recidivism: absconding, reincarceration	LSI-R; Total sample=25.10 (female=25.05 male=25.12) No gender differences; Gender differences in child abuse	NA

Table 5 Continued

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Holsinger et al. (2003, USA)	Examined the LSI-R scores by gender & race; Identified criminogenic factors	1093 male 249 female 189 Native 1153 non-native	NA	X^2 analysis; T-test; Linear regression	(1) LSI-R & subscales (2) Age (3) Race (4) Gender	LSI-R score differences by gender & race Native American= 28.03 Non-native American =22.22	Salient factors <For male> : Criminal history, Leisure/Recreation, Companion, Alcohol/Drug <For Female> : Financial score, Family/marital, Emotional/personal
Holtfreter et al. (2004, USA)	Assessed the influence of poverty on recidivism for female offenders	First interview: 402 women in gender-responsive program & traditional program; 2nd interview: 134 women felony	6 months	Correlation; T-Test Logistic regression;	(1) LSI-R (2) Age (3) Education (4) poverty (5) Minority/non-hispanic Caucasian (6) Recidivism: rearrest, violation of parole or probation	Poverty is a powerful predictor of recidivism for female offenders	NA
Simourd (2006, PA)	Tested the reliability and predictive validity of the LSI-R	964 male inmates; 70 female inmates	25-624 days	Internal consistency; Inter-rater reliability; Correlation; T-test;	(1) LSI-R (2) Socio-demographic info. (3) Criminal history (4) Gender (5) Institutional behavior (6) Technical parole violation (6) Recidivism	Coefficient α =.85; Gender differences; (Male=24.1 Female=21.9) No racial differences in risk score; Support inter-rater reliability	<For males> Family/marital; Accommodation; Leisure/Recreation; Companions; Attitude/orientation <For female> Emotional/personal

Table 5 Continued

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Resig et al. (2006, USA)	Assessed the predictive validity of women offender who classified into gendered pathways to crime	400 women under community supervision	18 months	Correlation; T-test; ANOVA; Logistic regression	(1) LSI-R (2) Age (3) Minority (4) Education (5)Time at risk (2) Recidivism: violation of supervision conditions, rearrest, reconviction, revocation of community supervision	LSI-R=17.75; Support predictive validity; Overclassification for harmed & harming women; Underclassification for drug offenders	NA
Lowenkamp et al. (in press)	Assessed the predictive validity of the LSI-R for male and female probationers; Compared the utility of the LSI-SV with the LSI-R	369 male on probation 116 female on probation	1.5 years	Correlation;	(1) LSI-R (2) LSI-SV (3) Recidivism: rearrest, Reincarceration	Pearson'r ; Rearrest; r=.37 (M=.38, F=.34) Reincarceration; (male=.33, female=.34) No gender differences; Confirm the utility of the LSI-SV	NA
Folsom & Atkinson (2007, Canada)	Assessed the predictive validity of the LSI:SR and CAT-SR	100 female offenders	6 years	Internal consistency; ROC analysis; Survival analysis; Logistic regression	(1) LSI-R & subscales (2) Childhood & Adolescent Taxon Scale (3) Recidivism: general & violent recidivism	Cronbach α = .52 LSI-SR; 18 Support predictive validity; Significant differences in survival rates	NA
Palmer & Hollin (2007, UK)	Examined predictive validity	150 female prisoners	2.5 years	Internal consistency; Correlations; Factor analysis; Sequential logistic regression; Survival analysis	(1) LSI-R (2) Age (3) Criminal History (4) Recidivism: reconviction	Cronbach α =.93 ; LSI-R; 23.00 Support predictive validity Age negatively correlated with LSI-R	Accommodation, Companions, Family/Marital, Alcohol/drug, Emotional/Personal

Table 5 Continued

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Heilbrun et al. (2008, USA)	Examined gender specific factors	1435 male offenders, 886 female offenders	NA	Chi-square test; T-test	(1) 8 LSI-R subscales (2) age (3) race (4) marital status (5) education (6) gender (7) sentence length	Different criminogenic factors by gender; Racial difference in both group (female group having a higher % of Caucasians, male group of African American	\<For female\> Financial, Companion, Family/Marital, Accommodation, alcohol/drug \<For male\> Criminal history
Research with Exceptional Populations							
Simourd & Malcolm (1998, Canada)	Examining the psychometric properties of sex offender group	216 male sexual offenders	NA	Reliability test; Correlations coefficient-convergent validity; ANOVA-Discriminat validity Factor-analysis	(1) LSI-R & subscales (2) PCL-R (3) General statistical information on recidivism	Cronbach α=.89 LSI-R: 24.2 (Adult victim group : 27.34 Extra familial child molesters: 26.52 Familial child molesters: 20.15)	Discriminant factors for sex offenders: Criminal history, education/employment, accommodation, companions, alcohol/drug, attitude/orientation sub components
Girard & Wormith (2004, Canada)	Test predictive validity with sexual offenders, domestic violence offenders, & mentally-ill prisoners	454 male inmates & 176 probationer	2.5 years	Correlation; Multiple regression;	(1) LSI-OR (2) Recidivism: general & violent	Cronbach α = .62 LSI-R scores; Domestic violence group>non DVG Mental problem group > No mental problem group; No difference in recidivism by offense type	Not identified

Table 5 Continued

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Kelly & Welsh (2008, PA, USA)	Exploring the predictive validity of the LSI-R with drug offenders	276 male drug offenders	1.4 years	Reliability test Bivariate correlation (Spearman's rho);	(1) LSI-R (2) Drug & Alcohol problem (2) Recidivism; reincarceration	Coefficient; (p<.001) r=.25(LSI-R) r=.16, alcohol/drug	Drug offenders; Alcohol/Drug subscale
Research with Different Races							
Holsinger et al. (2003, USA)	Examined the LSI-R scores by gender & race; Identified criminogenic factors	189 Native 1153 non-native	NA	X^2 analysis; T-test; Linear regression	(1) LSI-R & subscales (2) Age (3) Race (4) Gender	LSI-R score differences by gender & race Native American= 28.03 Non-native American =22.22	<For Non-native American> Leisure/Recreation, Companion <For Native American> Criminal history, Education/employment, Financial, Family/marital, Accommodation, Companion
Simourd (2006, PA)	Tested the reliability and predictive validity of the LSI-R by race and gender	1034 male & female (Causasian-45.1%, African American-36%, Hispanic (12%)	25-624 days	Internal consistency; Inter-rater reliability; Correlation; T-test;	(1) LSI-R (2) Socio-demographic info. (3) Criminal history (4) Gender (5) Race (6) Institutional behavior (7) Technical parole violation (8) Recidivism	No racial differences in risk score	NA
Whieacre (2006, USA)	Examined the overclassification & underclassification by race	532 males in federal community corrections center Black=279, White=177, Hispanic= 76	NA	Frequency (contingency table)	(1) LSI-R (2) Program outcome (3) In-program disciplinary Incidents	High and Low risk level: Over-classification for African American, Underclassification for Caucasian & Hispanic	NA

Table 5 Continued

Research Summary about the LSI-R

Study	Topic	Sample	Follow-up	Analytical Process	Measurement of Variables	Findings	Major Predictors for recidivism
Fass et al. (2008, USA)	Described criminogenic factors and compared predictive validities of the COMPAS and the LSI-R	975 male offender (African-71.4%, Hispanic-15%, Caucasian-13%)	12 month	T-Test; Logistic regression	(1) LSI-R (2) COMPAS (3)# of arrest (adult, juvenile) (4) Rearrest	African Americans more overclassified, Hispanics & Caucasians more underclassified; Criminal history was strongly related to rearrest;	NA

CHAPTER III

METHODOLOGY

The previous chapter underscored the importance of risk-need assessment of offenders in order to achieve the goal of reducing recidivism and enhancing institutional security. Gender, offense type, and race were discussed as major salient factors affecting risk and need levels of offenders, which ultimately induce variation in recidivism. Multiple studies of the LSI-R were discussed at length to emphasize the gap between theoretical concepts and practices in risk-need assessment.

The intent of this research is to assess the validity of the LSI-R in terms of recidivism according to gender and offense type. So, the distinct four groups were formed by gender and offense type. Furthermore, the predictive validity of the LSI-R for recidivism was investigated depending on the racial groups: Whites, Blacks, and Hispanics[16].Thus, the chapter begins with specifying several hypotheses drawn from research questions. The research design and data source section follows and the methodology section continues with explanations about variables and an analysis plan. Finally, human subject protection for this study is discussed.

Research Hypotheses

As addressed previously, the following research questions were proposed to examine the validity of the LSI-R by gender and offense type, and race.

1. Does the LSI-R score profile differently according to gender & offense type, and race?

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[16] According to the PADOC Monthly Institutional Profile, racial categorization consists of White, Black, Hispanic and Others but this research excludes the "Others" category as a separate racial group in its analysis due to insufficient sample size.

2. To what extent is the LSI-R a valid predictor of recidivism by gender and offense type, and race?

3. Which LSI-R subscales are salient in assessing criminogenic needs by gender, offense type, and race?

Based on these research questions, the proposed study examines gender and offense type impact and racial impact on the risk assessment (i.e., LSI-R score) and recidivism. Therefore, the first phase of this study is to explore the combined influence of gender and offense type on the LSI-R scores and recidivism. To do this, the data set is divided into four groups: a Violent Male Offender group (VMO), a Nonviolent Male Offender group (NMO), a Violent Female Offender group (VFO), and a Non-violent Female Offender Group (NFO). The second phase of the proposed study is to test the racial impact on the LSI-R score and recidivism. After the data set was classified by gender, differential racial groups were formulated: Whites, Blacks, and Hispanics. The following hypotheses are proposed:

H_1: The mean LSI-R score of male offender groups will be significantly higher than the one describing female offender groups (Males > Females).

Regarding the gender and offense type impact on the LSI-R score, it is expected that male offender groups are significantly higher on the LSI-R scores than female offender groups. Even with such expectations, the literature reflects inconsistent results in terms of the gender impact on LSI-R scores. For instance, Simourd (2006) reported significant differences of the LSI-R scores by gender, whereas Lowenkamp et al. (2001) found no differences in LSI-R scores between male and female offenders. Simourd's study

reported that males earned a significantly higher result on the LSI-R scores than female offenders. H_1 offers a further test of the gender impact on the LSI-R scores.

H_2: *The mean LSI-R score of a violent male offender group will be significantly higher than that of the nonviolent male offender group (VMO>NMO).* Hollin and Palmer's study (2003) reported that the LSI-R mean score for the violent offender group were significantly higher than that of the non-violent offender group. Loza and Simourd's study (1994) with male federal offenders in Canada supported Hollin and Palmer's findings. By testing this hypothesis, the offense type impact on risk scores is investigated within male offender groups.

H_3: *The mean LSI-R score of the violent male offender group will be higher than that of the violent female offender group (VMO>VFO).* In general, male inmates have higher means scores on the LSI-R than do female inmates (Andrews & Bonta, 2003; Simourd, 2006); however, no studies compare gender differences of risk scores within violent offender groups. This hypothesis tests the gender impact on the LSI-R score within violent offender groups.

H_4: *The mean LSI-R score of the violent female offender group will be higher than that of the non-violent female groups (VFO >NFO).* It is assumed that the LSI-R score varies according to offense type within female offender groups. The literature reveals no citations of research comparing LSI-R scores between violent and non-violent female offenders. As H_2 suggested, H_4 tests violent offense type effect on the risk scores within same gender groups.

H_5: *The degree to which LSI-R scores predict recidivism will be different across the four distinct groups.* Overall, existing studies have supported the predictive validity of

the LSI-R regardless of gender and offense type, as the previous review of literature demonstrated but the magnitude of the predictive validity varied depending on the subjects (O'Keefe et al., 1998) and the definition of recidivism (Kroner & Mills, 2001). Therefore, H_5 examines and compares the predictive validity of the LSI-R for distinct groups.

H_6: Salient criminogenic factors of LSI-R subscales in terms of predicting recidivism will be different by the formed groups. Several studies identified the salient factors for male and female offenders (Hollin et al., 2003; Holinsger et al., 2003; Simourd, 2006). By testing H_6, this study identifies the salient factors for each group.

H_7: Recidivism will be different by LSI-R scores of racial groups: Caucasian, African American, Hispanic and others. Much of the research with different races found significant differences in risk scores according to racial groups (Holsinger, et al., 2003). Several studies showed that minority populations were more likely to be over-classified (Fass et al., 2008; Whiteacre, 2006). H_7 examines the LSI-R for racial differences in classification errors.

H_8: Salient criminogenic factors of the LSI-R subscales in terms of predicting recidivism will be different by racial groups. Although there was much similarity in criminogenic factors for African American and Hispanic offender groups according to Schlager and Simourd's study (2007), this study examines the promising psychometric properties by racial groups by testing H_8.

H_9: Gender, race, offense type and the LSI-R score will be associated with recidivism. To find the most plausible factor in predicting recidivism, H_9 is examined. Several studies have focused on finding the most valid predictor of recidivism. Various

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factors were identified as plausible factors in predicting recidivism, for example, poverty, age, and criminal history (Holtfreter, 2004; Resig et al., 2006; Fass et al., 2008). This dissertation also explores which factor is the most reliable among variables introduced under the study in predicting recidivism by testing H_9.

Procedure of Classification

All inmates admitted to Pennsylvania State Correctional Institutions need to be classified: male inmates are classified at the SCI Camp Hill while female inmates are classified at the SCI Muncy (PADOC, 2008). The entire classification procedure is regulated by the Reception and Classification Policy of the PADOC (2003, Appendix B). The risk and need assessment are practiced by the Pennsylvania Additive Classification Tool (PACT)[17] in determining appropriate programs and custody levels for inmates. The PACT utilizes three assessment instruments: the LSI-R for recidivism, the Criminal Sentiments Scale-Modified for the levels of inmates' criminal thinking, and the Hostile Interpretations Questionnaire for the tendency of an inmate's hostility (PADOC, 2008).

The initial classification procedure takes four to six weeks and reclassification also is arranged, mostly annually, to update the existing classification file. Accordingly, since the LSI-R has been administered for all convicted offenders as an intake procedure

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[17] "In 1991, the Pennsylvania Department of Corrections used a grant from the National Institute of Corrections to develop the Pennsylvania Additive Classification Tool (PACT), an instrument designed to measure an individual's risk level during the period of incarceration and to establish custody levels. The PACT was developed by an advisory team and a consultant from the National Council on Crime and Delinquency and administered to a 900-person sample of the Pennsylvania state prison population. During a recent re-validation of PACT, the DOC found that the instrument had "strong predictive validity and required only minor adjustments" (Council of State Government, p. 134). In addition, according to the Reception and Classification (PADOC Policy # 11.2.1.), "the PACT is designed to reduce over-classification of the offenders resulting in the placement of inmates in the least restrictive security level based on an objective assessment of his/her custody needs" (p. 2.)

(Appendix B), every inmate under PADOC custody must have his or her LSI-R initial

score, which assesses the possibility of re-offending.

Study Population and Data Source

This study was approved by both the Indiana University of Pennsylvania

Institutional Review Board and the PADOC Research Review Committee. The proposed

study utilized secondary data to achieve the goals of the research. The initial

classification data were derived from the PADOC. The study population consisted of

male and female offenders who were released from the PADOC facilities in 2004.

Considering the fact that the LSI-R started to be widely accepted in the late 1990s as a

major risk assessment instrument, this selected year included inmates who served in

prison more than five years, which leads to the inclusion of long-term incarcerated

inmates in the study population.

Only cases with complete LSI-R information and demographic data such as age,

gender and race were retained for this research. In addition to data pertaining to each

offender's LSI-R results, recidivism data also were collected as well as current offense

type information. The number of offenders released in 2004 was 14,660 from the PA

DOC. Among those who were released in 2004, the study participants were limited to

those who completed the LSI-R at the time of their admission to prison. Consequently,

the sample in this study represented all releases between January and December of 2004

for which initial LSI-R data and recidivism data was utilized as of December 2006. The

follow-up period was varied depending on the offender's release date, ranging from 24

months to 36 months. The data set from PADOC was given by Microsoft Access files

which included as follows:

1. Offenders' demographic table: age, race/ethnicity, education, IQ, sex, and current offense.

2. The LSI-R total scores and individual item results for the 54 LSI-R items.

3. Move Data file: the date of release, recidivism records (up to 36 month follow-up period).

Independent Variables

Since, in the validation study, independent variables are referred to as potential predictors of the dependent variable, all risk factors in the LSI-R are believed to have predictive validity (Alexander & Austin, 1994). Along with the predictors that are included in the LSI-R, the present study introduces new possible predictors of recidivism and factors to affect risk scores.

Gender

In the criminal justice system, gender has various implications in predicting future behaviors of offenders. As shown in the previous chapter, the research on the LSI-R reveals inconsistent results on the impact of gender on risk scores (Holsinger et al., 2003; Lowenkamp et al., 2001). This dissertation conceptualizes gender as a biological difference and the PADOC offender files include gender information measured by either male or female for every offender.

Offense Type

Hollin and Palmer's research (2003) defined a violent group as inmates charged with robbery, rape, and manslaughter, while they defined a non-violent group as those who were convicted of offenses such as burglary, theft, forgery, and property damage. Similarly, Loza and Simourd's study (1994) defined the violent category as murder,

manslaughter, assault, kidnapping, and forcible confinement, and the nonviolent category as theft, mischief, and property offenses. Both studies defined violent and non-violent offenses based on the current or past offense record.

The PADOC classifies offenders into Part I and Part II offenses according to UCR offense types. Part I includes murder, manslaughter, homicide by vehicle, forcible rape, robbery, aggravated assault, burglary, theft/larceny, and arson. Part II constitutes other assault, forgery, fraud, receiving stolen property/weapon, drunken driving, prison breach, kidnapping, statutory rape, deviate sexual intercourse, other sex offense, narcotic drug laws, and others (PADOC, 2000). These categories basically derive from the Uniform Crime Reports' Part I and II categories that are based on the frequency of their occurrences (Federal Bureau of Investigation [FBI], n.d.). However, this categorization does not reflect the seriousness of crime. Since the current study's categorization for violent and non-violent offenses indicates the seriousness of offenses, PART I and II categories do not appear to be relevant for this study.

FBI's UCR program provides the definition of violent crime as such offenses that involve force or the threat of force: murder, non-negligent manslaughter, forcible rape, robbery, and aggravated assault (FBI, 2008). The division into violent and nonviolent crimes based on this FBI definition from *Crime in the United States* (FBI, 2008) appears reasonable for the present study due to its reflection of the seriousness of crime. Thus, this study utilizes the FBI's categorization for the division of violent and non-violent offenses.

Accordingly, the violent offense category consists of murder, manslaughter, homicide, rape, aggravated assault, arson, kidnapping and the non-violent offense

category includes other assault, forgery, fraud, burglary, theft/larceny, drug-related crimes and property crime based on inmate's current offense.

Race

Race was not used as a major risk factor for predicting the possibility of future criminal behaviors but it was used as a control variable, because it showed significant relationships with other predictors (Listwan et al., 2007). The empirical research regarding racial impact on the risk score and recidivism had shown inconsistent results. Therefore, the proposed research investigated the racial impact on the LSI-R score and recidivism. Conceptually, race is commonly determined by asking a question as to which ethnic group an individual belongs based on his or her awareness. Hence, this research divides offenders into four racial groups based on the PADOC Institutional Profile: White, Black, Hispanic, and Others. However, the category of "Others" was excluded due to the insufficient sample size.

LSI-R Total Score and Subscales

The LSI-R is "a quantitative survey of offenders attributes and their situation relevant to level of service decisions" (Andrews & Bonta, 2001, p. 1). Conceptually, the LSI-R should be completed at the point of reception into prison, as part of the standardized assessment procedure for offenders at two central classification centers according to PADOC classification policy (Appendix B). The LSI-R yields continuous values (i.e., interval levels) ranging from 0 to 54 as the risk score for each offender. Such an initial procedure is conducted by "a correctional team skilled in the area of social work, psychology, psychiatry, academic and vocational education, counseling, religion, and custody" (PADOC, 2003, p. 2, Appendix B).

The LSI-R consists of 54 items categorized into 10 subscales. Each item has a 'Yes' or 'No' format or a '0 to 3' rating scheme as mentioned in Chapter II. This rating implies the following scales: "3"- A satisfactory situation with no need for improvement; "2"- A relatively satisfactory situation, with some room for evident improvement; "1"- A relatively unsatisfactory situation with a need for improvement; "0"- A very unsatisfactory situation with a very clear and strong need for improvement (Andrews & Bonta, 2001, p. 5). Regarding the interpretation of the LSI-R score, the LSI-R Manual (Andrews & Bonta, 2001) provides cutoff scores for each risk levels: low-, medium-, and maximum- risk bands as follows:

0 - 23 Low risk : Approximately 11.7% - 31.1% chance of recidivism

24 - 33 Medium risk: Approximately 48.1% - 57.3% chance of recidivism

34 or more High risk: Approximately 76.0% chance of recidivism

Even with the suggested risk bands for given raw LSI-R scores, Andrews and Bonta also encouraged the development of the researcher's own guideline according to the characteristics of the research population. Nevertheless, this study classified into three levels of risk bands based on the above suggested cut-off scores.

In addition, many of the LSI-R subscales represent dynamic factors, namely criminogenic factors. As a matter of fact, such dynamic factors need to be changed in order to reduce recidivism and are considered as targeted factors of treatment programs (Andrews & Bonta, 2001). The LSI-R subcomponents are examined to identify salient criminogenic factors in predicting recidivism for formed groups. All subcomponents are measured as continuous variables, with maximum scores ranging from 2 to 10. Table 6 presents the structure of the LSI-R and the scoring system for each subcomponent.

Table 6

LSI-R Subcomponents and Scores

Component (risk score)	Question No.	Items	Item Score (S/D)[*]
Criminal history (10)	1-3	Prior convictions	3(S)
	4	Current charges	1(S)
	5	Arrest under age 16	1(S)
	6-10	Custody and institutional misconduct	5(S)
Education/employment (10)	11	Currently unemployed	1(D)
	12-14	Employment problems	3(S/D)
	15-17	Schooling	3(S/D)
	18-20	Poor rewards: performance, peers, authority	3(D)
Financial (2)	21-22	Problems & social welfare reliance	2(D)
Family/Marital (4)	23	Current marital dissatisfaction	1(D)
	24-25	Non-rewarding parents & relatives	2(D)
	26	Convicted close relatives	1(S/D)
Accommodation (3)	27-28	Dissatisfaction / mobility	2(D)
	29	High crime neighborhood	1(D)
Leisure/Recreation (2)	30-31	Poor activity participation & use of time	2(D)
Companions (5)	32	Social isolation	1(D)
	33-36	Attitude to crime of acquaintances / friends	4(D)
Alcohol/Drug problem (9)	37-38	Past alcohol or drug problems	2(S)
	39-40	Current alcohol or drugs problems	2(D)
	41-45	Situational problems	5(D)
Emotional / Personal (5)	46-47	Abilities affected	2(D)
	48-49	Past mental health treatment	2(S)
	50	Psychological assessment indicator	1(D)
Attitude / Orientation (4)	51-54	Supportive of crime and poor to sentence	4(D)
Total LSI-R Score	54		

*S stands for Static factors, while D means dynamic factors that are commonly called criminogenic needs.
(Andrews & Bonta, 2001, See also Raynor et al., 2000, p. 60)

Age

Age is one of the more promising variables in predicting future offenses

regardless of gender. A considerable amount of research suggests the variation in

recidivism along with this factor. For example, Hardyman (2001) reported age as the

most common gender-specific risk factor. In particular, age showed a negative

relationship with the LSI-R score (Palmer & Hollin, 2007), prison misconduct

(Cunningham et al., 2005) and the recidivism rate (FLDOC, 2001). A significant age

difference was reported between violent and nonviolent offenders (Hollin & Palmer, 2003). Not surprisingly, the recidivism within 24 months after release also varied according to age groups as follows (FLDOC, 2001):

Under 18 : approximately 52%
18 – 24 : approximately 40%
25 – 34 : approximately 36%
35 – 49 : approximately 30%
50 – 59 : approximately 15%
Over 60 : approximately, less than 10%

In general, the recidivism rate decreased by 2.1% as age increased by one year. This study evaluated the impact of age on risk score and recidivism. The variance of recidivism depending on offenders' age was examined.

Dependent Variables

Based on the risk assessment literature, three kinds of outcome variables have been utilized in evaluating the predictive validity of the LSI-R: current custody levels (Hollin & Palmer, 2003); institutional misconduct (Van Voorhis et. al., 2008); and recidivism (Coulson et al., 1996; Folsom & Atkinson, 2007; Girard & Wormith, 2004; Holtfreter et al., 2004; Kroner & Mills, 2001; Lowenkamp et al., 2001; O'Keefe et al., 1998; Resig et al., 2006; Simourd, 2004; Simourd & Malcolm, 1998).

Considering the characteristics of the LSI-R as a major classification tool to determine initial security placement, the custody level is supposed to be determined by the LSI-R scores. As far as classification staff does not have too much discretion in deciding the custody level of offenders, the LSI-R score inevitably results in higher positive correlation with the current custody level, which may be mainly due to tautological flaws. Nevertheless, it has been used as an outcome variable for the validation studies of the LSI-R when the recidivism data are not available.

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By contrast, institutional misconduct is a better outcome variable than the current custody level. Yet, "time sequence" needs to be taken into account when using institutional misconduct as a dependent variable. Since the LSI-R items include a question about whether an inmate was involved in institutional misconduct in the past (Appendix A), only institutional misconducts after an initial evaluation for given sentence should be considered as an outcome measurement for examining the validity of the LSI-R. To assure appropriate time order about institutional misconduct for all participants, the full record of institutional misconduct with specific dates involved is necessary. Without such data, adoption of the institutional misconduct as a dependent variable is in question because of the inaccurate time sequence or offender's confusion about it, when he or she provided this information.

Given that risk assessment, by nature, is related to predicting the probability of future criminal activity, recidivism is the most reliable outcome variable. Much of the literature reflects recidivism as a dependent variable. The following provides the conceptual and operational definition of recidivism for this study.

Recidivism

Recidivism is defined conceptually as "a return to crime" (Bonta, Dauvergne, & Rugge, 2003, p. 1) and the recidivism rate means "the percentage of inmates released during a specific time period who commit a new offense within a certain time following their release" (Florida Department of Corrections [FLDOC], 2001, p. 2). Thus, the performance and the follow-up period need to be defined in order to measure recidivism.

First, even with some variations with the performance measure of recidivism presented in Table 5 in Chapter II, the measurement of recidivism generally includes re-

arrest, reconviction, re-incarceration, and violation/revocation of community supervision (Listwan et al., 2007; Management & Training Corporation, 2003; Resig et al., 2006). The Pennsylvania Department of Corrections defined recidivism as "return to the custody of the PADOC for any reason," measured by re-incarceration of an ex-offender (PADOC, 2006, p. 11). The present study also adopts this broad meaning as the operational definition of recidivism because this study was based on the PADOC's recidivism data.

The second factor to be identified in the measurement of recidivism is the length of a follow-up period. Although a longer follow-up period is associated with higher recidivism rates, the two to three year follow-up period catches overall 40 % to 50% of recidivism (Bonta et al., 2003; Flaherty, 2006). Kroner & Mills (2001) reported that approximately 80% of high risk offenders reoffended within two years after release. Furthermore, the FLDOC Recidivism Report (2001) reported that the two-year follow-up period provides a stable and reliable measurement for recidivism in evaluating incarceration impact on recidivism as minimized confounding factors from post-release experiences. Although the recidivism rate increased most quickly immediately after release, the recidivism rate after two years from release stabilized (FLDOC, 2001). The recidivism rates ranged from 32% to 47.1% with the three year follow-up period (Flaherty, 2006). Accordingly, two year follow-up period and more is a reasonable recidivism measure.

Recidivism data for all offenders in the study sample were recorded by December, 2006. So, the two to three year follow-up period data were available for all offenders released in 2004. In sum, recidivism for the present study is measured as re-incarceration within two to three years from release. The dependent variable was coded one (1) if the

participant was re-incarcerated and a zero (0) if not re-incarcerated. Table 7 presents a coding scheme for independent and dependent variables.

LSI-R Total Score

LSI-R total score is used as a dependent variable for H_1 through H_4 because these hypotheses examine whether the LSI-R scores differently profile depending on offender's gender and offense type. In addition, LSI-R total score also serves as an independent variable to test H_5 and H_7 because these hypothesized the relationship between LSI-R total scores and recidivism based on gender and offense type, and race. Since H_9 seeks to find the most promising factors in predicting recidivism among gender, offense type, race, and LSI-R total score, LSI-R total score is utilized as an independent variable as well. As a result, LSI-R total scores serve as a dependent variable for H_1 through H_4 and an independent variable for H_5, H_7, and H_9.

Table 7

Coding Scheme for Variables

Variables	Measurement Level	Coding	Indication
Age	Interval	Older than 18 years old	Age
Gender	Nominal	0 = female / 1 = male	Sex
Offense type	Nominal	0 = nonviolent / 1 = violent	ot
Gender * Offense type	Nominal	1 = VMO / 2 = NMO 3 = VFO / 4 = NFO	gen*ot
Race	Nominal	1 = White (1, nonwhite=0) 2= Black (1, nonblack=0) 3 = Hispanic (1, nonhispanic=0)	Race
LSI-R subscale$_{1}$-$_{10}$	Interval	Max. range from 2 to 10	LSI-R $_{sub1 - sub 10}$
LSI-R total score	Interval	1 to 54	LSI-R$_{tot}$
Recidivim	Nominal	0 = non-recidivist / 1 = recidivist	Recidivism

Analytical Procedures

Various statistical methods have been utilized in validation studies of risk assessment inventories: the simple inspection of cross-classification tables, multiple-regression, multiple discriminate function analysis, multidimensional contingency table analyses, logit, probit, and tobit analysis, a variety of clustering approaches, and neutral network models (Gottfredson & Moriarty, 2006). It is clear from cited studies in the literature review that multiple regressions are most commonly used to support the validity of risk assessment tools. By running a series of multiple regressions, most existing research about the validity of risk assessment inventories focused on how accurately such inventories predict offenders' risk in comparing their recidivism with the predictive scores throughout the follow-up period.

A number of analyses were performed on the data set: these include descriptive statistics, reliability tests, and inferential statistics by conducting a series of hypotheses tests. These analyses were conducted by the researcher using SPSS 17.0.

Descriptive Statistics

Descriptive statistics provide the description of the sample participants and the relationship among variables (Babbie, 2004; Tabachnick & Fidell, 1996). A descriptive analysis yields tables that present demographic and legal characteristics of participants, distribution of scores across items, the central tendency of the LSI-R score (e.g., mean) and risk levels for each group.

Reliability Estimates

A reliability analysis was conducted to test the internal consistency of LSI-R items. Internal consistency is related to "the degree to which an item in a scale correlates

with one another and reflects on the structural integrity of the scale" (Simourd, 2006, p. 8). All items in the scale should be measured on an interval or ratio scale (Cronk, 2006) but 54 items of the LSI-R are measured by nominal scale. A reliability analysis for 54 LSI-R items cannot be run to examine the internal consistency. Instead, ten subscales, which measured on a ratio scale, were used for the reliability analysis. According to established research, the majority of the subscales have good levels of internal consistency. Since there is no precise cutoff score for internal consistency estimates, it is generally accepted that an alpha value of .70 or greater is a reliable measure (De Vellis, 2002; Simourd, 2006). For the present study, this guideline was accepted. According to LSI-R manual, overall, alpha coefficients for the LSI-R are around .70s based on the empirical research (Andrews & Bonta, 2001).

Inferential Statistics

Although descriptive statistics illustrate information about the characteristics of the research sample, the ultimate goal of descriptive statistics is to provide a rationale for logical reasoning based on the sample of the population, namely, inferential statistics (Babbie, 2004). Inferential statistics test hypotheses to examine whether the differences of given variables exist in the population based on the study sample (Tabachnick & Fidell, 1996). Because, statistically, hypothesis testing involves the test of a series of null hypotheses that assume "there is no relationship among the variables under study, a researcher concludes that the variables are related after having statistically rejected the null hypothesis" (Babbie, 2004, p. 49). The proposed study made inference about the population through a series of hypotheses testing.

Analysis of variance test (ANOVA). The analysis of variance test was used for a hypothesis test where an independent variable consists of two or more categories and the dependent variable is measured quantitatively (Bachman & Paternoster, 2004). Whereas a one-way analysis of variance test measures the effect of one factor, two-way analysis of variance (also, called Factorial ANOVA) simultaneously assesses the effect of two independent variables on the dependent variable (Cronk, 2006). A two-way ANOVA test not only measures the gender effect and the offense type effect on LSI-R scores but also assesses the possible interaction effect of the two independent variables. Accordingly, the effects of gender and offense type on risk scores were examined by running a two-way ANOVA test. It examines 1) the main effect of gender; 2) the main effect of offense type; 3) the gender and offense type interaction effect. The validity of the LSI-R was tested by showing different composite LSI-R scores among groups hypothesized as follows:

H_1: *LSI-R mean score of Males > LSI-R mean score of Females*

H_2: *LSI-R mean score of VMO > LSI-R mean score of NMO*

H_3: *LSI-R mean score of VMO > LSI-R mean score of VFO*

H_4: *LSI-R mean score of VFO > LSI-R mean score of NFO*

However, since ANOVA tests do not indicate which particular population means are different, a post hoc test also is needed. Post hoc multiple comparisons by Duncan's new Multiple Range Test were utilized to inform which group means were different from each other. Since the ANOVA does not provide information about the magnitude of the relationship between independent and dependent variables, eta squared (η^2) was calculated, raging from zero, implying no relationship between independent and dependent variables, and 1.0, implying a perfect relationship between variables. The

interpretation of the value of eta squared is guided by Bachman and Paternoster's "old rule" as follows:

.0 - .29 : weak relationship

.3 - .59 : moderate relationship

Greater than .60 : strong relationship   (2004, p. 430)

Logistic regression analyses. The goal of logistic regression is to identify variables to predict outcome and the magnitude of the predictors' effect on outcome on the basis of continuous and/or categorical independent variables (Tabachnick & Fidell, 1996). Logistic regression can be used to determine the percent of variance in the dependent variable explained by independent variables; to rank the relative importance of independent variables; to assess interaction effects; and to understand the impact of covariate control variables. Logistic regression constructs regression equations with the dichotomous dependent variable and independent variables that are any type such as continuous, discrete, and dichotomous or a mixed measurement (Bachman & Paternoster, 2004; Tabachnick & Fidell, 1996). Accordingly, logistic regression has flexible assumptions with variables and distributional requirements for predictors unlike multiple regression analyses.

Logistic regression yields the probability of a particular outcome for each case. As Raynor, Kynch, Roberts, & Merrington (2000) used logistic regression to investigate which subscales of the LSI-R were promising predictors for reconviction with male and female offender groups, much of the research about predictive validity of the LSI-R has utilized logistic regression. The present study also ran logistic regression to test H_5 through H_9. As presented previously, LSI-R total scores and 10 LSI-R subscales were

measured as continuous variables as independent variables, whereas the dependent variable, recidivism, was measured by a dichotomous value in these hypotheses.

H_5 tested the association between LSI-R scores and recidivism by formed groups, while H_7 investigated the relationship between LSI-R scores and recidivism by racial groups. Promising criminogenic factors among 10 LSI-R subscales in predicting recidivism were identified by testing H_6 for the groups formed by gender and offense type. Testing H_8 specified the most relevant criminogenic factors among 10 LSI-R subscales in predicting recidivism for different racial groups. Finally, major predictors among independent variables such as gender, offense type, race and LSI-R scores on recidivism were identified by H_9 regressing recidivism onto all four independent variables.

Supplemental Analyses. Several additional analyses were conducted. Recidivism studies have commonly used survival/failure time analysis to specify the time to recidivism (Holtfreter et al., 2004). While survival analysis provides several regression models, Cox-regression is considered as a powerful technique to examine the relationship between predictors and time to recidivism (Lewicki & Hill, 2006). In Cox regression, predictors are measured by continuous or categorical variables. Thus, Cox regression was performed for predictors of four distinct groups and different racial groups. This technique produced a failure curve to explain the relationship between the time and hazard ratio. In addition, a factor analysis was conducted to check the underlying structure of the LSI-R items. Table 8 summarizes an analysis procedure described from the above.

Table 8

Summary of Analytical Procedure

Proposed Hypotheses (Relevant Research Questions)	Key features of Statistics	Analytic Strategy	Goal of Analysis *
Descriptive Statistics	Description of the sample	Cross-tabulation, Chi-square for correlation between the LSI-R score & recidivism, Frequency table	Representativeness of the sample
Reliability test	Reliability of the instrument	Cronbach's Alpha	Internal-consistency of the LSI-R
H1 – H4: gen*ot $\rightarrow$ LSI-R score (RQ # 1)	Significance of group differences	Two-way ANOVA	Determine validity of the LSI-R in assessing risk
H5. gen*ot : LSI-R$_{tot}$$\rightarrow$recidivism (RQ # 2)	Significance of group difference of the relationship between LSI-R score & recidivism	Logistic regression	Determine predictive validity of the LSI-R by gender and violent offense type
H6.gen*ot : LSI-R$_{sub10}$$\rightarrow$recidivism (RQ #3)	Identification of Salient factors of the LSI-R subscales	Logistic regression	Create a linear combination of the log of the odds of being in same group
H7. race: LSI-R$_{tot}$$\rightarrow$ recidivism (RQ # 2)	Predictive validity of the LSI-R for different racial groups	Logistic regression	Determine predictive validity of the LSI-R by race
H8. race: LSI-R$_{sub10}$$\rightarrow$ recidivism (RQ #3)	Identification of salient factors of the LSI-R subscales by racial groups	Logistic regression	Create a linear combination of the log of the odds of being in same racial groups
H9. gen, ot, race, LSI-R$_{tot}$ $\rightarrow$ recidivism		Logistic regression	Create a log linear combination of IVs to optimally predict DV

* Goal of analysis (Tabachnick & Fidell, 1996, pp. 30-32)

Human Subject Protection

As this study involves the use of archival data from the PADOC, no serious

concerns about human subject protection are raised related to any components of the

dissertation. As stated earlier, since the LSI-R data collection had been previously

completed as the formal step of intake procedures in correctional facilities (Appendix A),

no contact with any participants in this research is needed.

The data set from the PADOC included the demographic factors of the offenders

who were released in 2004 from state prisons. The data set did not disclose identifying

information about individual offenders because the individual record was managed by

"move-count-number." The data set was provided as Microsoft Access files and was

stored on the researcher's computer. Then, the data set was exported to an SPSS data file.

Therefore, it is impossible to identify a specific offender's record. Since the information

that the PADOC provided was treated anonymously for the purpose of statistical analyses,

anonymity of participants was maintained throughout the process of research analyses. In

addition, the data analyses were based on the formed groups and aggregated data and

there were no results reported about an individual.

The Institutional Review Board of Indiana University of Pennsylvania approved

this research throughout an expedited review. Also, the PADOC reviewed this research

according to their protocols and approved by sending its data file by postal mail service.

Summary

In this chapter, detailed research procedures were explained step by step including

data collection and the analysis procedure. All variables included in the study were

described above and nine hypotheses and the methods were introduced in detail. In

particular, statistical analysis plans were presented with descriptive statistics, reliability estimates, bivariate analysis, and multivariate analysis.

The first step is to determine if the LSI-R is effective in assessing inmates' risk based on gender and violence type, after which the relationship between the LSI-R scores and recidivism is assessed throughout a series of statistical techniques. Next, the racial impact on risk scores and recidivism is investigated according to the formed racial groups: White, Black, & Hispanic. Finally, the risk prediction model was presented to identify the most plausible predictor in recidivism.

This chapter also discussed the issue of human subject protection. With respect to this issue, there is no salient threat to participants because of the nature of archival research; anonymity is maintained throughout the research procedures. In the next chapter, the findings of the research are presented and discussed.

CHAPTER IV

ANALYSIS AND RESULTS

Introduction

This chapter assesses the hypotheses described in the previous chapter to
determine the relationship between LSI-R scores, gender, offense type, race and
recidivism in order to address the proposed research questions. Data were divided into
four gender and offense type interaction groups: Violent Male Offenders (VMO),
Nonviolent Male Offenders (NMO), Violent Female Offenders (VFO), and Nonviolent
Female Offenders (NFO). Groups also were categorized by race, that is, Whites, Blacks,
and Hispanics.

This chapter is organized as follows. The first section examines the characteristics
of the sample by introducing frequency tables and descriptive statistics for the sample.
The second section describes the results of hypothesis tests for H_1 through H_4 using
ANOVA. In the third section, the results of logistic regression analysis are presented by
testing H_5 through H_9. The following section discusses the additional statistical analyses
such as a survival/failure time analysis and a factor analysis. Finally, concerns about
limitations of methodological design are discussed.

Frequencies and Descriptive Statistics

Description of the Original Data Set

Participants in this analysis were drawn from those who were released in 2004
from PA correctional facilities. The total number of 14,660 offenders' data was obtained
including demographic characteristics, LSI-R data, and recidivism information as of
December, 2006. The sample was comprised overwhelmingly of male offenders (93.0%).

Regarding the racial distribution of the original data set, half of offenders are Blacks (50.2%), while most of the remaining offenders are Whites (37.0%) or Hispanics (12.1%). There also are 29 Asians, 23 American Indians, and 16 others in the total sample, but those were excluded in the analysis due to the small number of the sample size (0.5% of the total sample). The majority of the sample's last convicted offense was recorded as non-violent (63.5%). With respect to recidivism, the majority of the offenders were not recidivists (58.4%). Appendix C presents the frequencies and descriptive statistics for the original data set.

Description of the Research Sample

Since this study was intended to test the LSI-R's validity in terms of recidivism, the sample included all those released in 2004 who had a valid LSI-R score (n=12,975). Table 9 summarizes the frequency counts for this sample. The majority of the research sample was comprised of male offenders (92.8%). Such a composition of gender in the sample represents the identical gender distribution in the Pennsylvania prison population.

The racial minority of the research sample was Hispanic (12.3%), while White and Black constituted the majority, 36.9% and 50.3%, respectively. The percentages of offense types were 63.1% for nonviolent offenders and 36.9% for violent offenders. With regard to recidivism, the majority were non-recidivists (63.6%). Such recidivism rates of the study sample represented the similar trends of established research about recidivism, indicating recidivism rates ranging from "21% to 50%" within a 23 to 36 month follow-up period (Bonta et al., 2003, p. 3). Although the recidivism rate of the research sample is slightly lower than that of the complete data set, the distributions for gender, race, offense type and LSI-R scores remain identical.

Table 9

Frequency and Percentage for the Research Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender (n=12,975)	Male	12,038	92.8	92.8	92.8
	Female	937	7.2	7.2	100.0
Race (n=12,916)	White	4,793	36.9	37.1	37.1
	Black	6,524	50.3	50.5	87.6
	Hispanic	1,599	12.3	12.4	100.0
Offense Type (n=12,975)	Nonviolent	8,181	63.1	63.1	63.1
	Violent	4,794	36.9	36.9	100.0
Recidivism (n=12,975)	No	8,248	63.6	63.6	63.6
	Yes	4,727	36.4	36.9	100.0

Descriptive statistics of the research sample indicated the mean age of the offenders was approximately 35 years old, as shown in Table 10. The average IQ[18] is 91.28, which is consistent with the average IQ scores of Wechsler Adult Intelligence Scale, ranging from 90 to109 (Wechsler, 1997, p. 25; Appendix D). Female offenders revealed higher scores on IQ. Regarding education level, on average, offenders in this sample had not obtained high school diplomas, having had a mean of 11.07 years of formal education.

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[18] PA Correctional department uses Wechsler Adult Intelligence Scale for inmates' IQ test.

Table 10

Descriptive Statistics for the Research Sample

		N	Minimum	Maximum	Mean	Std. Deviation
Age		(12,975)	17	91	34.97	9.727
	Male	12,038	17	91	34.86	9.780
	Female	937	937	71	36.51	8.880
IQ		(12,896)	48	155	91.63	13.229
	Male	12,034	48	155	91.40	13.013
	Female	937	55	148	94.57	15.447
Education		(12,971)	0	20	11.07	1.743
	Male	12,034	0	20	11.07	1.724
	Female	937	0	16	11.09	1.996

Reliability of the LSI-R

Internal consistency reliability refers to as whether or not all items of the instrument reliably measure the same dimension (Andrews & Bonta, 2001). Although LSI-R consists of ten subscales with 54 items, it measures the likelihood of recidivism, which means the criminal propensity for convicted offenders. Thus, the reliability test investigates whether ten subscales measure the same underlying construct. The reliability of the LSI-R was assessed through Cronbach's alpha coefficient (α), as one of the commonly used tests of reliability (Cronk, 2006).

As discussed in Chapter III, in order to meet the assumption that all items should be measured on an interval or a ratio level, ten subscales were utilized for a reliability test since they were measured by a continuous scale. Consistent with previous research, the reliability for this study generated a moderate reliability score (α=.715, n=12,975), indicating acceptable levels of internal consistency (De Vellis, 2002). The inspection of

the inter-correlation matrix shows overall modest inter-scale correlations among

subcomponents as given in Table 11.

Table 11

LSI-R Subcomponent Inter-Correlations and Subcomponent-Total Correlations

	A	B	C	D	E	F	G	H	I	J	K
A. Criminal History	--										
B. Education/Employment	.226	--									
C. Financial	.141	.270	--								
D. Family/Marital	.185	.245	.222	--							
E. Accommodation	.167	.251	.228	.302	--						
F. Leisure/Recreation	.088	.205	.158	.140	.184	--					
G. Companions	.184	.307	.133	.198	.249	.176	--				
H. Alcohol/Drug	.264	.266	.199	.193	.172	.119	.271	--			
I. Emotional/Personal	.093	.147	.149	.147	.047	.034	.033	.229	--		
J. Attitude/Orientation	.214	.189	.148	.203	.200	.273	.230	.184	.157	--	
K. LSI-R total	.564	.650	.424	.492	.453	.370	.531	.668	.398	.497	--
M	5.94	6.46	.92	1.37	.80	.99	2.70	4.49	1.49	.98	26.13
SD	2.04	2.18	.76	1.16	.87	.89	1.35	2.53	1.41	1.26	7.80

Note : Correlations are significant at the 0.01 level.

Relationship between Gender, Offense Type and the LSI-R

Descriptive Statistics by Gender and Offense Type

To address research question #1 as to whether the LSI-R score profiles differently

depending on gender and offense type, H_1 through H_4 were proposed. Descriptive

statistics for four distinct groups are presented in Table 12. While education levels did

not reveal any differences among groups, significant differences were found in IQ, F (3,

12892) = 18.409, p=.000 and age, F (3, 12971) = 19.562, p=.000 (Appendix E). A

Duncan's new multiple range test was used to determine the nature of the differences

among the groups. This analysis revealed the average IQ of the NFO was the highest of

the four groups at 95.2, followed by the VFO (92.98), the VMO (91.44), and the NMO

(91.38). Average ages of each group were 36 for the NFO, 34 for the NMO, and 35 for

both VMO and VFO. The average age of the NFO was significantly higher than the

average ages of the VMO and the NMO, as Table 12 presents.

Table 12

Descriptive Statistics by Gender & Offense Type

		Education	IQ	Age
VMO	Mean	11.09	91.44	35.48
	N	4,527	4,491	4,527
	Std. Deviation	1.728	12.827	10.002
	Minimum	0	53	18.00
	Maximum	20	151	91.00
NMO	Mean	11.05	91.38	34.48
	N	7,507	7,470	7,511
	Std. Deviation	1.722	13.125	9.625
	Minimum	0	48	17.00
	Maximum	20	155	80.00
VFO	Mean	11.09	92.98	35.63
	N	267	266	267
	Std. Deviation	1.805	14.925	9.099
	Minimum	4	59	21.00
	Maximum	16	141	66.00
NFO	Mean	11.09	95.20	36.85
	N	670	669	670
	Std. Deviation	2.028	15.615	8.773
	Minimum	0	55	19.00
	Maximum	16	149	71.00
Total	Mean	11.07	91.63	34.97
	N	12,971	12,896	12,975
	Std. Deviation	1.743	13.229	9.727
	Minimum	0	48	17.00
	Maximum	20	155	91.00

Gender and Offense Type Impact on the LSI-R

Research question #1 assumes that the LSI-R score would differently profile offenders' risk scores based on gender, offense type and race. To determine whether gender, offense type and interaction between gender and offense type affect the LSI-R scores, a two-way ANOVA was conducted. A significant main effect for gender was found [F (1, 12971) = 17.743, p=0.000, partial η^2=.001), as shown in Table 13. Nevertheless, the calculated effect size indicates that a very small proportion of risk score variance is accounted for by gender. However, the main effect for offense type and the interaction effect between gender and offense type was not significant on the LSI-R scores.

Table 13

Two-Way ANOVA for Effect of Gender and Offense Type on the LSI-R

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1373.352[a]	3	457.784	7.523	.000	.002
Intercept	1876869.674	1	1876869.674	30845.509	.000	.704
Gender	1079.644	1	1079.644	17.743	.000	.001
Offense Type	8.648	1	8.648	.142	.706	.000
Gen * Offense type	.776	1	.776	.013	.910	.000
Error	789251.892	12971	60.847			
Total	9666452.000	12975				
Corrected Total	790625.244	12974				

a. R Squared = .002 (Adjusted R Squared = .002)

The first four hypotheses compare LSI-R scores by groups. These hypotheses are that the male offender group would have a higher LSI-R mean score than the female offender group (*H₁*: Males>Females), violent males would have a higher score than

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nonviolent males (H_2: VMO>NMO), violent males would have a higher score than violent females (H_3: VMO>VFO), and violent females would have a higher mean score than nonviolent females (H_4: VFO>NFO).

The average males' risk scores (26.24) were significantly higher than the average females' risk score (25.01) [F (1, 12974) = 4.08, p = .000]. The result supports H_1 that male offenders are more likely to have higher scores on the LSI-R than female offenders. Table 14 presents the LSI-R scores for these four groups. A series of t-tests were conducted to test H_2, H_3, and H_4. There was no significant difference in the comparison of the LSI-R mean scores between VMO and NMO, t (12,036) = - .979, p = .328. However, the comparison between VMO and VFO revealed that VMO scored significantly higher than VFO [t (4,792) = 2.401, p = .016]. In the comparison of female offender groups, offense type did not have a significant effect on the LSI-R scores [t (935) = -.128, p=.898]. As a result, offense type did not have a significant effect for either male or the female offender groups. Accordingly, for this sample H_1 and H_3 were supported but H_2 and H_4 were not supported.

Table 14

Group Statistics of the LSI-R

Group	N	Mean	SD	Minimum	Maximum
VMO	4,527	26.1544	7.88061	.00	51.00
NMO	7,511	26.2973	7.68708	1.00	48.00
VFO	267	24.9588	8.35458	5.00	47.00
NFO	670	25.0358	8.27653	2.00	48.00
Total	12,975	26.1548	7.80636	.00	51.00

Relationship between LSI-R and Recidivism

Gender and Offense Type

To address Research question #2 about the degree of the LSI-R as a valid predictor of recidivism for gender and offense type groups and racial groups, H_5 and H_7 were proposed. Low-, medium, and high risk band groups were formulated to examine the extent of the predictability of the LSI-R. Cramer's V was introduced as a method to evaluate the correlation between risk bands and recidivism. Pearson's r is generally used to address correlation between two quantitative variables (Bachman & Paternoster, 2004). Since risk bands and recidivism are categorical variables, a Cramer's V or a phi coefficient[19] are appropriate statistics to assess the strength of this relationship (Warner, 2007). Then, a series of logistic regressions were conducted to test the fifth hypothesis.

First of all, the LSI-R mean score was computed for a recidivism group and a non-recidivism group. The LSI-R mean score for recidivists was 27.35 with standard deviation of 7.24, while the mean score of non-recidivists was 25.46 with standard deviation of 8.02, indicating a statistically significant difference, $t(12,973) = 13.332$, p=.000 (Appendix F).

A comparison of recidivism between gender-offense type groups found a 36% recidivism rate for the VMO and a 37.7% recidivism rate for the NMO. The recidivism rate for the NFO (31.0%) was greater than the recidivism rate for VFO (20.2%). The group differences of recidivism rates were statistically significant, $\chi^2 (3) = 44.623$, p=.000 (Appendix G).

Offenders in the sample were collapsed into different risk levels based on the cutoff scores discussed in Chapter III. Table 15 presents frequency counts of risk levels

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[19] Both Cramer's V and phi coefficient were calculated and the values were identical.

for four groups. For the overall sample, 35.4% (n=4,604) of the sample was represented by low risk level and 46.9% (n=6,089) of the sample was categorized into medium risk level. The remaining 17.6% (n=2,282) of the sample was classified as high risk level offenders. As shown in Table 15, 41.3% (n=942) of offenders in the high risk band had returned to correctional facilities. Offenders in the medium risk band showed 39.8% (n=2,424) of the recidivism rate, whereas offenders in the low risk band showed 29.6% (n=1,361) of recidivism rate. Therefore, the differences of recidivism rates were statistically significant depending on the risk bands for the entire sample, as shown in Table 15. Cramer's V also indicated relationship between risk bands and recidivism.

The VMO group consisted of 35.5% for low risk level (n=1,609) with the recidivism rate of 28.5%, 47.6%of the group for medium risk level (n=2,155) with the recidivism rate of 39.8%, and 16.8% of the VMO group for high risk level (n=763) with the recidivism rate of 41.0%. A correlation coefficient was calculated by using Cramer's V and a significant interaction between risk bands and recidivism was found. The NMO group showed a similar composition for risk levels with the VMO group, represented by 34.4% for low risk level (n=2,586) with 31.4% of the recidivism rate, 47.4% of the group for medium risk level (n=3,563) with the recidivism rate of 40.7%, and 18.1% of the NMO group for high risk level (n=1,362) with 42% of the recidivism rate. A correlation coefficient revealed a significant interaction between recidivism and risk bands for this group.

Although female offender groups indicated a similar distribution within risk band categories, their recidivism rates were lower than those of male offender groups. The VFO group presented 10.9% of recidivism for the low risk band, 25.5% of recidivism for

the medium risk band, and 33.3% of recidivism for the high-risk band. Also, a significant

correlation was found between the risk band category and recidivism for the VFO group.

The NFO showed slightly higher rates of recidivism than VFO group: 26.2%, 34%, and

3.5% for low-, medium- and high-risk bands respectively, as presented in Table 15.

Although the significant correlations between risk bands and recidivism were

found for the VMO, the NMO, and the VFO, the strength of these relationships were

weak, as Cramer's V indicated. The nature of the relationship was that the offenders in

higher risk bands had a significantly higher proportion of recidivism than the offenders in

lower risk bands. In particular, the VFO group is more sensitive in recidivism by

increasing risk band than any other groups. These results supported H_5.

Table 15

Frequency and Percentage of Risk Bands by Gender and Offense Type

Risk Band(LSI-R score)	Overall Sample	VMO	NMO	VFO	NFO
Low (0-23)	4,604 (35.4)[a]	1,609(35.5)[b]	2,586(34.4)[b]	119(44.7)[b]	290 (43.2)[b]
Recidivism No (%)	3,243 (70.4)	1,150 (71.4)	1,773 (68.7)	106 (89.1)	214 (73.8)
Yes (%)	1,361 (29.6)	459 (28.5)	813 (31.4)	13 (10.9)	76 (26.2)
Medium (24-33)	6,089(46.9)[a]	2,155(47.6)[b]	3,563(47.4)[b]	106(39.7)[b]	265 (39.6)[b]
Recidivism No (%)	3,665 (60.2)	1,297 (60.2)	2,114 (59.3)	79 (74.5)	175 (66.0)
Yes (%)	2,424 (39.8)	858 (39.8)	1,449 (40.7)	27 (25.5)	90 (34.0)
High (34 or more)	2,282 (17.6)[a]	763(16.8)[b]	1,362(18.1)[b]	42(15.7)[b]	115(17.2)[b]
Recidivism No (%)	1,340 (58.7)	450 (59.0)	789 (58.0)	28 (66.7)	73 (63.5)
Yes (%)	942 (41.3)	313 (41.0)	573 (42.0)	14 (33.3)	42 (36.5)
Total	12,975(100.0)	4,527(100.0)	7,511(100.0)	267(100.0)	670(100.0)
Recidivism No (%)	8,248 (63.7)	2,897 (64.0)	4,676 (62.3)	213 (79.8)	462 (69.0)
Yes (%)	4,727 (36.3)	1,630 (36.0)	2,829 (37.7)	54 (20.2)	208 (31.0)
Correlation Cramer's V	.106	.116	.095	.218	.093
Sig.	.000	.000	.000	.002	.054
Valid N	12,975	4,527	7,511	267	670

Note: [a] The percentages indicate the proportion of each risk band for the entire sample.
   [b] The percentages indicate the proportion of each risk band within distinct groups formed
   by gender and offense type.

In addition, Table 16 presents the results of logistic regressions on recidivism by groups. Overall, the LSI-R was a significant predictor of recidivism for all groups. Since odds multipliers[20] were greater than 1 for all groups, the effect of increasing the LSI-R score is to increase the odds of committing recidivism. A one-unit increase in risk scores increases the odds of recidivism by 3.4% for the VMO, 2.9% for the NMO, 7.3% for the VFO, and 3.4% for the NFO.

Table 16

Logistic Regression for LSI-R by Gender and Offense Type

Dependent Variable: Recidivism

		B	S.E.	Wald	Df	Sig.	Exp(B)
VMO	LSI-R	.033	.004	67.951	1	.000	1.034
(n=4,527)	Constant	-1.457	.113	167.583	1	.000	.233
NMO	LSI-R	.028	.003	80.892	1	.000	1.029
(n=7,511)	Constant	-1.254	.088	204.034	1	.000	.285
VFO	LSI-R	.070	.020	12.906	1	.000	1.073
(n=267)	Constant	-3.228	.564	32.791	1	.000	.040
NFO	LSI-R	.034	.010	10.651	1	.000	1.034
(n=670)	Constant	-1.656	.280	34.924	1	.000	.191

Racial Groups

Research question #2 also inquires about the extent of the validity of the LSI-R depending on racial groups as H_7 proposed. Table 17 summarizes the frequency of each risk band for racial groups. Black represented the highest recidivism rates for all three risk levels. Especially, the Black offender group among high risk bands showed the highest recidivism rate, 43.0%, followed by the White offender group, 40.3%, whereas

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[20] In logistic regression, if Exp (B) or odds multiplier is greater than 1, it means increase in the odds of the dependent variable. If Exp (B) is equal to 1, the odds of the dependent variable are not changed but if Exp (B) is less than 1, the odds of the dependent variable decrease. Also, the percent change in the odds of the dependent variable is obtained by using the following formula: {Exp (B)-1} × 100. (Bachman & Paternoster, 2004).

the Hispanic group had the lowest recidivism rate of 38.1%. There was a 27.6%

recidivism rate for Whites, a 31.6% recidivism rate for Blacks, and a 28.2% recidivism

rate for Hispanics, within the low risk groups. Also, a 39.7%, 40.1%, and 38.8%

recidivism rate for Whites, Blacks, and Hispanics respectively were obtained for the

medium risk bands. Significant relationships between risk band category and recidivism

were found for all groups, although the magnitude of association between risk band and

recidivism is very weak as indicated by Cramer's V.

Table 17

Frequency and Percentage for Risk Bands by Race

Risk Band (LSI-R Score)	White	Black	Hispanic
Low (0-23)	1,797(37.5)[b]	2,212(33.9)[b]	570(35.6)[b]
Recidivism 0 = No	1,301 (72.4)	1,512 (68.4)	409 (71.8)
1 = Yes	496 (27.6)	700 (31.6)	161 (28.2)
Medium (24-33)	2,138(44.6)[b]	3,197(49.0)[b]	730(45.7)[b]
Recidivism 0 = No	1,289 (60.3)	1,915 (59.9)	447 (61.2)
1 = Yes	849 (39.7)	1,282 (40.1)	283(38.8)
High (34 or more)	858(17.9)[b]	1,115(17.1)[b]	299(18.7)[b]
Recidivism 0 = No	512 (59.7)	635 (57.0)	185 (61.9)
1 = Yes	346 (40.3)	480 (43.0)	114 (38.1)
Total	4,793(100)	6,524(100.0)	1,599(100.0)
Recidivism 0 = No	3,102(64.7)	4,062 (62.3)	1,041 (65.1)
1 = Yes	1,691(35.3)	2,462(37.7)	558 (34.9)
Correlation Cramer's V	.125	.093	.104
Sig.	.000	.000	.000
Valid N	4,793	6,524	1,599

[a] The percentages indicate the proportion of each risk band for the entire sample.
[b] The percentages indicate the proportion of each risk band within each racial group.

Table 18 indicates the results of the logistic regression for recidivism by racial

groups. The LSI-R score was a reliable predictor for each racial group. The changes in

odds of the recidivism, when the LSI-R score increases by a 1-unit, were 3.5% for

Whites, 2.9% for Blacks, and 3.3% for Hispanics. The increase of the LSI-R score causes

a greater likelihood of recidivism for all racial groups. The correlation coefficients,

Cramer's V for each racial group were obtained as follows: Whites = .175 (p=.000),

Blacks = .135 (p = .000), Hispanics =.200 (p = .000). So, the magnitudes of the

correlation coefficients varied depending on offender's race.

Table 18

Logistic Regression for LSI-R Score by Race

							Dependent Variable: Recidivism
		B	S.E.	Wald	Df	Sig.	Exp(B)
White	LSI-R	.034	.004	80.781	1	.000	1.035
(n=4,793)	Constant	-1.504	.106	202.777	1	.000	.222
Black	LSI-R	.029	.003	67.206	1	.000	1.029
(n=6,524)	Constant	-1.259	.097	169.670	1	.000	.284
Hispanic	LSI-R	.032	.007	22.214	1	.000	1.033
(n=1,599)	Constant	-1.478	.191	59.980	1	.000	.228

Promising Predictors of LSI-R Subscales

Gender and Offense Type

To address Research Question #3 as to whether or not there exist different

promising criminogenic factors depending on gender and offense type, H_6 was proposed.

Table 19 summarizes regression coefficients for the logistic model for each group. All the

variables in the LSI-R were tested and regression results indicated the overall model of

ten predictors was statistically reliable for the VMO, the NMO, and the NFO but not for

the VFO. Each model correctly classified 63.8% of the VMO, 65.2% of the NMO, 63.0%

of the VFO, and 62.5% for NFO into the recidivists and non-recidivists categories.

Table 19

Tests of Model Coefficients for Gender and Offense Type

	-2 Log likelihood	Chi-square	Df	Dependent variable: Recidivism Sig
VMO	5731.293	129.435	10	.000
NMO	9665.225	169.181	10	.000
VFO	247.101	18.113	10	.054
NFO	792.386	30.036	10	.001

Regression coefficients, including ten LSI-R variables, are presented in Table 20. It indicates that criminal history, education/employment, financial, accommodation, companions, alcohol/drug, emotional/personal subscales are promising factors in predicting recidivism for the VMO, at the significant level of $p < .05$. Yet, both financial and emotional/personal factors show a negative relationship with recidivism.

For the NMO, a Wald statistic indicated that criminal history, education/employment, accommodation, leisure/recreation, companions, emotional/personal traits, and attitude factors were significant predictors for recidivism. This is consistent with the regression results of the entire sample. However, any of ten subscales was not statistically reliable in predicting recidivism for the VFO. In other words, the LSI-R subscales appear to be not valid predictors of recidivism for this group.

Finally, logistic regression was conducted for the NFO. The overall model was reliable in classifying nonviolent female offenders into recidivists and non-recidivists. Only two subscales among ten criminogenic factors, criminal history and recreation/leisure, appears to be reliable predictors for the NFO, as also indicated in Table 20.

Table 20

Summary of Logistic Regression Analyses in Predicting Recidivism by Gender and Offense Type

Predictors	VMO (n=4,527)					NMO (n=7,511)					VFO (n=267)					NFO (n=670)				
	B	S.E.	Wald	Sig.	Exp(B)	B	S.E.	Wald	Sig.	Exp(B)	B	S.E.	Wald	Sig.	Exp(B)	B	S.E.	Wald	Sig.	Exp(B)
Criminal History	.107	.017	38.696	.000	1.113	.091	.013	49.761	.000	1.095	.125	.090	1.939	.164	1.133	.195	.047	17.376	.000	1.215
Edu/Employment	.042	.017	6.260	.012	1.043	.078	.013	37.436	.000	1.081	.071	.092	.590	.442	1.073	.037	.048	.589	.443	1.038
Financial	-.093	.045	4.316	.038	.911	-.016	.034	.230	.631	.984	.177	.244	.524	.469	1.194	.016	.125	.017	.897	1.016
Family/Marital	.021	.029	.520	.471	1.021	-.042	.023	3.398	.065	.959	-.149	.170	.768	.381	.862	-.002	.087	.000	.985	.998
Accommodation	.092	.039	5.501	.019	1.097	.068	.030	5.049	.025	1.070	.054	.200	.073	.787	1.056	.047	.108	.193	.660	1.048
Leisure/Recreation	.045	.038	1.457	.227	1.046	.058	.029	3.969	.046	1.059	-.129	.219	.345	.557	.879	.234	.115	4.111	.043	1.263
Companions	.080	.026	9.502	.002	1.083	.043	.020	4.382	.036	1.043	-.095	.135	.499	.480	.909	-.027	.069	.158	.691	.973
Alcohol/Drug	.035	.014	6.327	.012	1.035	.019	.011	3.167	.075	1.020	.071	.063	1.258	.262	1.074	-.019	.038	.254	.614	.981
Emotional/Personal	-.065	.024	7.105	.008	.937	-.045	.018	6.155	.013	.956	.107	.116	.848	.357	1.113	.022	.061	.135	.714	1.022
Attitude/Orientation	-.050	.027	3.315	.069	.952	-.062	.021	8.754	.003	.940	.231	.143	2.610	.106	1.260	-.005	.078	.004	.951	.995
Constant	-1.788	.136	172.347	.000	.167	-1.686	.107	250.023	.000	.185	-3.045	.752	16.393	.000	.048	-2.273	.359	40.158	.000	.103

Note: df=1

In addition, logistic regression for the entire sample was conducted and the regression coefficient was obtained, as indicated in Table 21. It indicates that both dynamic and static factors in the LSI-R were statistically reliable predictors for recidivism [-2 Log Likelihood=16496.722, χ^2 (10) = 334.499, p=.000]. Most of the variables in the LSI-R significantly predict recidivism except for financial and family/marital subscales. The emotion/personal and attitude/orientation factors have the negative association with the recidivism.

Table 21

Logistic Regression Analysis in Predicting Recidivism for the Overall Sample

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	Criminal History	.105	.010	111.285	1	.000	1.110
	Education/Employment	.064	.010	41.998	1	.000	1.066
	Financial	-.046	.026	3.028	1	.082	.956
	Family/Marital	-.022	.017	1.616	1	.204	.978
	Accommodation	.073	.023	9.932	1	.002	1.076
	Leisure/Recreation	.060	.022	7.457	1	.006	1.062
	Companions	.057	.015	13.851	1	.000	1.059
	Alcohol/Drug	.025	.008	9.296	1	.002	1.025
	Emotional/Personal	-.054	.014	15.095	1	.000	.948
	Attitude/Orientation	-.053	.016	11.033	1	.001	.948
	Constant	-1.788	.081	493.053	1	.000	.167

Racial Group

The eighth hypothesis was proposed to assess salient predictors for recidivism depending on racial groups. Descriptive statistics based on the race is meaningful to understand the characteristics of the sample. Table 22 presents the descriptive statistics of racial groups for the sample. The average ages for Whites, Blacks, and Hispanics are 35, 34, and 33, respectively. Regarding education levels, the Hispanics showed the lowest

level of education by revealing an average attainment of ninth grade, while the average school year attainment for Whites and Blacks was eleventh grade.

With regard to IQ, White offenders were the highest (97.28) group, whereas Black offenders (88.59) showed slightly higher scores than that of Hispanic offenders (87.04). LSI-R risk scores showed the highest for Black offenders (M=26.38, SD=7.4848), then Hispanic offenders (M=26.10, SD=7.877) followed by White offenders (M=25.88, SD=8.182).

Hispanic offenders were most likely to recidivate, indicating recidivism rate of 44.84%, while White offenders were less likely to recidivate with a recidivism rate of 39.42%. Black offenders had a 43.29% chance of recidivism. Significant differences were noted among different racial groups for age, education, IQ, LSI-R and recidivism rates ($p< .05$) (Appendix H).

Table 22

Descriptive Statistics by Race

Race		Age	Education	IQ	LSI-R
White	Mean	35.8554	11.39	97.28	25.8817
	N	4,793	4,791	4,768	4,793
	SD	10.36601	1.586	12.993	8.18288
Black	Mean	34.7442	11.10	88.59	26.3801
	N	6,524	6,522	6,475	6,524
	SD	9.34935	1.557	12.042	7.48456
Hispanic	Mean	33.2614	9.94	87.04	26.1038
	N	1,599	1,599	1,594	1,599
	SD	8.96645	2.330	12.690	7.87785

Regression coefficients were obtained by running logistic regressions for each racial group. First, regression coefficients of the overall model retaining ten subscales of the LSI-R was statistically reliable for Whites [-2 Log Likelihood=5977.685, $\chi^2(10)$=173.572, p=.000], Blacks [-2 Log Likelihood=8440.231, $\chi^2(10)$=127.579, p=.000], and Hispanics [-2 Log Likelihood=1990.757, $\chi^2(10)$=41.271, p=.036], in predicting recidivism.

In particular, criminal history and education/employment were promising predictors for all three racial groups. family/marital and attitude variables negatively predicted recidivism for White offenders, whereas accommodation, recreation/leisure and alcohol/drug variables positively predict recidivism for Black offenders. The Companion subscale and emotional/personal variables were promising predictors for both White and Black offenders but not Hispanic offenders. Regression coefficients for each racial group were presented in Table 23. The percentage of offenders correctly classified in terms of recidivism was calculated, which is 64.9% for Whites, 62.2% for Blacks and 64.9% for Hispanics.

Table 23

Summary of Logistic Regression Analyses in Predicting Recidivism by Race

		White (n=4,793)					Black (n=6,524)					Hispanic (n=1,599)				
		B	S.E.	Wald	Sig.	Exp(B)	B	S.E.	Wald	Sig.	Exp(B)	B	S.E.	Wald	Sig.	Exp(B)
Step 1[a]	Criminal History	.140	.017	71.032	.000	1.151	.078	.014	30.488	.000	1.081	.092	.028	10.714	.001	1.096
(df = 1)	Edu/Employment	.070	.016	18.658	.000	1.073	.061	.014	19.008	.000	1.063	.058	.029	4.078	.043	1.060
	Financial	-.037	.044	.728	.394	.963	-.041	.036	1.240	.266	.960	-.104	.076	1.886	.170	.901
	Family/Marital	-.058	.029	3.925	.048	.944	-.010	.024	.169	.681	.990	.049	.049	.967	.325	1.050
	Accommodation	.073	.041	3.215	.073	1.076	.075	.032	5.379	.020	1.078	.076	.065	1.394	.238	1.079
	Leisure/Recreation	.022	.037	.358	.550	1.023	.076	.031	6.015	.014	1.079	.110	.063	3.103	.078	1.116
	Companions	.071	.025	8.235	.004	1.074	.048	.022	4.899	.027	1.050	.027	.045	.347	.556	1.027
	Alcohol/Drug	.021	.014	2.294	.130	1.021	.027	.012	5.344	.021	1.027	.030	.025	1.456	.228	1.030
	Emotional/Personal	-.045	.022	4.110	.043	.956	-.066	.020	10.588	.001	.936	-.044	.041	1.155	.282	.957
	Attitude/Orientation	-.076	.027	8.153	.004	.926	-.036	.022	2.636	.104	.965	-.068	.049	1.923	.166	.934
	Constant	-1.960	.127	237.874	.000	.141	-1.613	.120	181.810	.000	.199	-1.795	.229	61.652	.000	.166

Salient Predictors of Independent Variables for Recidivism

One of the purposes of this research is to create a log linear combination of independent variables to correctly predict recidivism, as proposed in H_9. The research investigated the impact of age, gender, offense type, and race on recidivism. Logistic regression was conducted to determine salient predictors among independent variables for recidivism. Regression results indicated that the overall model was statistically reliable, -2 Log Likelihood = 16683.800, $\chi^2 (7) = 335.796$, p=.000.

Table 24 presents which independent variables significantly predict recidivism for the overall sample. Age, gender, offense type and LSI-R score were significant predictors for recidivism, while "race" was not identified as a significant predictor of recidivism. Accordingly, younger offenders were more likely to reoffend than older offenders. In other words, when the offender's age increases by one year, the odds of that person committing a re-offense decrease by a factor of .979.

Considering the relations between gender and recidivism, male offenders were more likely to return to prison, by increasing a 42% of change in the odds of recidivism, than female offenders. Violent offenders were more likely to recidivate with a 3.3% of change in odds of recidivism, than non-violent offenders. Also, those who had higher scores on the LSI-R appeared at higher recidivism rate. More specifically, a one-unit increase in the LSI-R score increased the likelihood of recidivism by a factor of 1.033.

Table 24

Logistic Regression for Independent Variables

							Dependent variable: Recidivism
		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	Age	-.021	.002	113.443	1	.000	.979
	Gender(1)	.352	.077	21.138	1	.000	1.422
	Offense Type(1)	.090	.039	5.404	1	.020	1.094
	LSI-R	.033	.002	183.926	1	.000	1.033
	White(1)	-.270	.298	.817	1	.366	.764
	Black(1)	-.333	.298	1.244	1	.265	.717
	Hispanic(1)	-.172	.302	.325	1	.568	.842
	Constant	-.596	.614	.944	1	.331	.551

Supplemental Statistical Analyses

Survival/Failure Analysis

"The primary goal of survival analysis is to describe the proportion of cases surviving or failing at various times within a single group or separately for different groups" (Tabachinick & Fidell, 1996, p. 773). This study estimated the relationship between the time to return to prison and LSI-R score by gender and offense type, and race. A Kaplan Meier Analysis produces failure time by calculating mean or median values (Tabachnick & Fidell, 1996). Table 25 presents the result of Kaplan Meier analysis. The failure time varied depending on the gender and offense type groups and racial groups. Interestingly, the VMO group yielded the longer failure time than any other groups. The failure times are similar across gender-offense type and racial groups, indicating that 26 months or so are reliable measure for recidivism. It also implies a reliable follow-up period in measuring recidivism.

Table 25

Kaplan-Meier Analysis for Groups

Factor		Survival Time (months)	Std. Error	95% Confident Interval	
				Lower Bound	Upper Bound
Gender & Offense type	VMO	27.075	.189	26.704	27.446
	NMO	26.600	.149	26.308	26.892
	VFO	30.873	.656	29.586	32.159
	NFO	28.222	.471	27.299	29.146
	Overall	27.126	.185	26.762	27.489
Race	White	27.126	.185	26.762	27.489
	Black	26.679	.159	26.368	26.990
	Hispanic	27.317	.314	26.700	27.933
	Overall	26.932	.113	26.711	27.153

Additionally, a Cox regression analysis was utilized to yield hazard ratios. In this analysis, recidivism is the censoring variable that indicates whether offenders committed a re-offense within the follow-up period. The failure time was measured by months to return to prison and the strata were gender-offense type and race. The regression coefficient for both gender-offense type and race strata were identical. The Cox-regression results by such are presented in Table 26.

The LSI-R score and age significantly predicts failure time, -2 Log Likelihood = 79361.016, χ^2 (2, n = 12,975) = 297.300, p=.000. The regression coefficients for the LSI-R score is 0.027. This means that for an increase of one unit of the LSI-R score, the hazard ratio increased by a factor of 1.028. In other words, a unit increase in the LSI-R score predicts the 2.8% increase in the hazard ratio and a unit increase of age causes a 1.7% decrease in the hazard ratio. Figure 1 presents the basic hazard curve by gender and offense type and Figure 2 present the basic hazard curve by race.

Table 26

Cox-Regression Results

	B	SE	Wald	Df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
LSI-R	.027	.002	204.897	1	.000	1.028	1.024	1.031
Age	-.017	.002	115.636	1	.000	.983	.980	.986
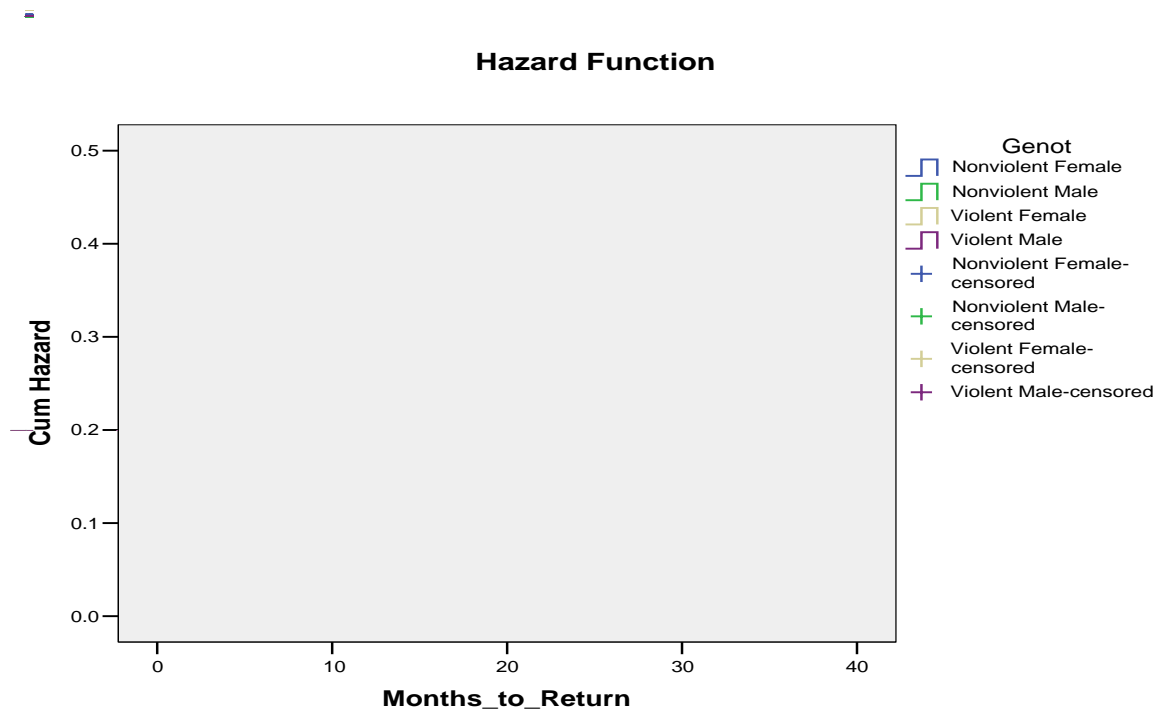
Figure 1

Failure time analysis by gender and offense type.

Hazard Function
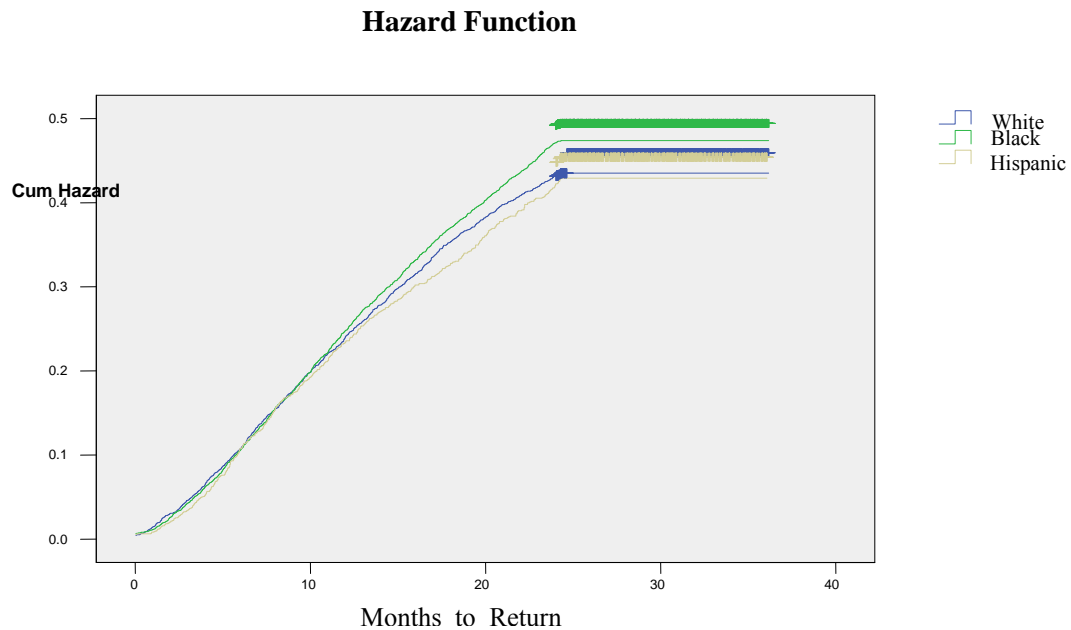
Figure 2

Failure time analysis by race.

Factor Analysis

A factor analysis was conducted to determine what, if any, underlying structure exists for measures on ten sub-scales of the LSI-R. In this analysis, recidivism was used as a selection variable in order to identify any subscales that can best predict recidivism, among ten subscales. A principle components analysis was conducted utilizing a varimax rotation with an eigenvalue 1 criterion. As can be seen in Table 27, the two factors were emerged in the rotated factor matrix. The first factor, criminal history, which accounted for 21.27% of variance in recidivism by aggregating factors typically associated with criminal conducts in the literature. The second factor, education/employment, accounted for 15.72% of variance in recidivism. The total variance was introduced in Table 27.

Table 27

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Criminal History	2.535	25.350	25.350	2.127	21.268	21.268
Education/Employment	1.164	11.638	36.988	1.572	15.720	36.988
Financial	.979	9.789	46.777			
Family/Marital	.917	9.168	55.945			
Accommodation	.853	8.533	64.478			
Leisure/Recreation	.839	8.387	72.865			
Companions	.725	7.245	80.111			
Alcohol/Drug	.704	7.037	87.148			
Emotional/Personal	.669	6.686	93.833			
Attitude/Orientation	.617	6.167	100.000			

Extraction Method: Principal Component Analysis.

a. Only cases for which Recidivism = 1 are used in the analysis phase.

Table 28

Rotated Component Matrix[a,b]

Subscale	Factor 1	Factor 2
Criminal History	.227	.433
Education/Employment	.519	.302
Financial	.363	.348
Family/Marital	.488	.275
Accommodation	.614	.087
Leisure/Recreation	.603	-.175
Companions	.594	.108
Alcohol/Drug	.193	.667
Emotional/Personal	-.161	.756
Attitude/Orientation	.527	.175

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser normalization.

a. Rotation converged in 3 iterations.

b. Only cases for which Recidivism = 1 are used in the analysis phase.

As Table 28 presents, two factors were extracted. Factor 1includes education/employment, family/martial, accommodation, leisure/recreation, companions and attitude, while factor 2 retains criminal history, alcohol/drug and emotional/personal subscales. Thus, such factors appear to represent a sociological factor and a psychological factor.

Summary

The current chapter focused on the statistical analysis to address research questions with regard to the validity of the LSI-R in predicting recidivism based on offenders' characteristics such as gender, offense type and race. Thus, nine hypotheses were tested by mainly utilizing two-way ANOVA and logistic regressions. The survival/failure time analysis and the factor analysis were conducted as supplemental analyses. The analyses can be divided into three domains: Gender impact on the LSI-R score and recidivism; Gender and offense type impact on the LSI-R and recidivism; Racial impact on the LSI-R score and recidivism.

H_1 through H_4 mainly tested gender and offense type impact on the LSI-R scores. While the gender impact on the LSI-R scores was statistically supported, the offense type impact and the interaction impact of gender and offense type on the risk score were not statistically significant. Therefore, the results of two-way ANOVA supported H_1 and H_3. There were not significant differences of the LSI-R intake assessment between VMO vs. NMO and VFO vs. NFO, thus failing to provide support for H_2 and H_4.

Regarding predictability of recidivism, LSI-R score was a strong predictor regardless of gender, offense type, and race according to the results of logistic regressions. The extent of the predictability of the LSI-R varied depending on the risk

bands for gender and offense type groups and racial groups. H_5 and H_7 were supported by the results of logistic regression and correlation analyses. However, the association between risk bands and recidivism within the NFO group was not significant.

In order to identify promising subscales of ten LSI-R subscales, H_6 and H_8 were tested by running logistic regression. Several of the subscales of the LSI-R significantly predicted recidivism among four groups and different racial groups. Criminal history and Education/employment tended most often to predict recidivism regardless of the gender or offense type, or races.

H_9 was proposed to identify the most promising predictor of recidivism among all independent variables introduced in this study. The results of logistic regression identified age, gender, offense type and LSI-R score as promising predictors for recidivism but race did not associate with recidivism. Finally, survival/failure time and factor analyses were conducted. The average survival time for the research sample was 27 months. Factor analysis extracted two factors among ten LSI-R subscales.

The following chapter discusses the significant research findings, interpretation of such findings, theoretical and practical implications, the limitations of the study, and recommendations for further research.

CHAPTER V

DISCUSSION AND CONCLUSIONS

The primary purpose of this dissertation was to expand the research on the LSI-R through an exploration of the predictive validity of the instrument for gender and offense type groups and racial groups. Since there has been an argument that the current risk assessment inventories have been developed for white male offenders, the critics have raised validity concerns for application of such inventories to minority populations (Bloom et al., 2003; Schlager & Simourd, 2007; Whiteacre, 2006).

To address this issue, this study empirically tested the validity of the LSI-R under the scheme of gender and race. The other variables, including offense type, were introduced as well. This chapter provides a careful examination of the significant findings of the research in light of existing studies. Also, this discussion addresses implications of the research findings, limitations of the study, and recommendations for further research.

Overview of Research Findings

Gender, Offense Type, Race and LSI-R

This dissertation examined the impacts of gender, offense type, and interaction of both gender and offense type, and race on the LSI-R scores. Only gender has a significant impact on the LSI-R score. Male offenders showed a higher average LSI-R total score than that of female offenders which is consistent with existing research (Holsinger et al., 2003; Lowenkamp et al., 2001). Women's risk scores, on average, tend to be lower than men's, indicating that female inmates are less dangerous than male inmates. In general, the male offenders are two points higher on their LSI-R score than that of their female

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counterparts (Andrews & Bonta, 2003; Simourd, 2006). As a result, for this sample the LSI-R appears to be a valid instrument to profile offender's risk levels by gender.

The group comparison also reflected the results of a logistic regression model containing gender, offense type and the combined variable of the two. The offense type did not affect the LSI-R risk scores within either male offender groups or female offender groups. A significant difference in the LSI-R scores between violent and non-violent offender groups was not found. Such a finding supports the LSI-R assessed risk levels of inmates regardless of offense type within this study sample.

Even though the combining impact of gender and offense type on the LSI-R score was not found, the statistical difference of the LSI-R score was found between VMO and VFO, indicating a higher score for the VMO. Of those four groups, the VFO also showed the lowest recidivism rate. Since the seriousness of the current offense is a primary factor in determining sentencing within the criminal justice system, there has been a concern about over-classification for violent female offenders (Van Voorhis & Presser, 2001). In particular, most of the violent female offenders committed crimes as a result of their victimization (Belknap & Holsinger, 2006; Bloom et at., 2003), rather than reflecting a high level of criminal tendency. This finding also suggests that violent female offenders may commit crimes as a situational reaction. For this group, assessment of offender's special circumstance for criminality should be included as an initial step for assessing their risk levels. Without considering such situational factors, over-classification, especially for violent females, would not be avoidable.

When comparing VMO's and NMO's LSI-R scores, no significant difference was found. This finding is contrary to the result of Hollin and Palmer's study (2003)

conducted in England. In their study, non-violent offenders (19.23) represented much lower LSI-R scores than violent offenders (28.91). One possible explanation for this result involves a different categorization of violent and nonviolent offender groups. Hollin and Palmer's categorization was based on the past and current criminal history, whereas this dissertation was based only on current offense type.

Results about a racial impact on the LSI-R scores were statistically significant between White (25.88) and Black (26.38), but no significant difference was found in the comparison with Hispanic (26.10). The fact that Black offenders had slightly higher mean score than that of White implies that Black offenders are more likely to recidivate than White. Considering that the Black offender group had the highest recidivism rate in the sample, this study finding supports that the LSI-R is a valid tool in differentiating risk score for different racial groups. The result of this study did not support the likelihood of over-classification for Black male offenders, although there has been a concern about the likelihood of over-classification especially for Black male offenders (Whiteacre, 2006).

Predictive Validity of the LSI-R

The current study provides further evidence that the total LSI-R score and the risk bands are significantly associated with recidivism. As expected, the LSI-R scores were significantly correlated with recidivism. The higher risk bands as a group were more likely related to recidivism. Consequently, offenders in the high risk band showed 41.3% of recidivism rate for the entire sample. There were different recidivism rates depending on the group characteristics. In general, female offender groups represented lower recidivism rates than male groups.

The VFO group showed the lowest recidivism rate of 20.2%. The NFO group's recidivism rate was 31%, while the VMO and the NMO showed 36%, and 37.7%, respectively. Considering slight differences of LSI-R mean scores for each group, there exists a large disparity for recidivism rates for each group, ranging from 20.2% to 37.7%. This result indicates that the risk levels of the VFO were assessed at a higher level than their actual risk level. The risk score difference between VFO and NFO was a one-point but the actual recidivism rate showed a10% of difference. Considering that the LSI-R risk score is a tool to predict recidivism rates for offenders, the recidivism rate of the VFO should be similar with the NFO group. The VFO revealed the lowest recidivism rate among four distinct groups but a significant difference risk scores between VFO and NFO was not found. This indicates the possibility of over-classification of cases for violent female offenders. Also, it raises validity concerns of the LSI-R for violent female offenders.

Regarding the predictive validity for different racial groups, it was found that the LSI-R score effectively predicts recidivism rates regardless of offender's races. The group with the higher scores on the LSI-R was more likely to be involved in recidivism. Thus, the Black offender group in this study sample showed the highest score on the LSI-R and was revealed to be the highest recidivist group.

The LSI-R is a valid tool in differentiating recidivists and non-recidivists. The recidivist group showed higher scores on the LSI-R (27.35) than the non-recidivist group (25.46). In conclusion, the findings of this research support the LSI-R as a valid instrument to distinguish different recidivism rates among offenders regardless of gender and race.

Predictors of Recidivism

Overall, eight subcomponents of ten LSI-R subscales were reliable in predicting recidivism for the research sample except for financial and family/marital factors. Interestingly, the emotion/personal factor and Attitude/Orientation factor revealed the negative association with the recidivism. Different predictors among LSI-R subcomponents were found when considering gender, offense type, and race. The results confirm the hypotheses that promising predictors would be different based on gender-offense type, and race. Table 29 summarizes promising predictors for each group.

Among ten sub-components, criminal history and education/employment were the salient predictors for male groups and different racial groups. Those two factors have been considered the best predictors for recidivism in the literature regardless of gender and race (Hollin & Palmer, 2003; Loza & Simourd, 1994). However, as mentioned previously, such factors also were not significant predictor for violent female offenders in this research sample.

Beside those two factors, accommodation and companions are reliable measures of recidivism for male offender groups regardless of offense type. The alcohol/drugs category is a promising predictor of recidivism especially for the VMO. The association between the alcohol/drugs category and violent offenses is strongly supported by existing studies (Hollin & Palmer, 2003). In general, major criminogenic factors for violent male offenders were identified, to include: criminal history, education/employment and alcohol/drugs (Hollin & Palmer, 2003; Holsinger et al., 2003; Loza & Simourd, 1994; Simourd, 2004). The findings of this research are consistent with established research in identifying such factors as the common predictors for violent male offenders.

Leisure/recreation, emotional/personal and attitude/orientation factors were identified as valid predictors of recidivism for non-violent male offenders. This result indicates the different criminality of non-violent offenders from violent male offenders. This finding supports that different predictors for recidivism can be utilized within male offender groups depending on offense type.

As shown in Table 29, LSI-R subscales were not reliable in predicting recidivism for the VFO group. Generally, criminal history has been considered a strong predictor of recidivism. The findings turned out that criminal history is not a valid predictor of recidivism for the VFO. It implicates female violent offenses would be caused by situational factors. If so, the structured subscales of the LSI-R are less likely to be effective in predicting risk of violent female offenders.

In contrast, two predictors were identified for the NFO group. Criminal history and leisure/recreation components were identified as strong predictors for the NFO group in this study sample. This means that female offenders with higher scores on criminal history and leisure/recreation were more likely to involve recidivism. It also was supported by the higher recidivism rate of the NFO than that of the VFO. Although an emotional/personal factor has been a major crimnogenic factor for female offenders in existing research (Holsinger et al., 2003; Simourd, 2006), this study failed to identify such predictors for female offenders.

The findings supported the assumption that most of the prediction variables in the LSI-R may not be gender-responsive factors. Van Voorhis et al.'s study (2008) identified gender responsive factors as emotion, relationship, parental stress, self-esteem and victimization but the LSI-R does not include most of such factors. They also pointed out

that the criminality of female offenders with high risk levels is qualitatively different from their male counterparts.

Table 29

Promising Predictors for Recidivism

Sub-Component	Gender*Offense Type				Race		
	VMO	NMO	VFO	NFO	White	Black	Hispanic
Criminal History	*	*		*	*	*	*
Education/Employment	*	*			*	*	*
Financial	*						
Family/Marital					*		
Accommodation	*	*				*	
Leisure/Recreation		*		*		*	
Companions	*	*			*	*	
Alcohol/Drug	*					*	
Emotional/Personal		*			*	*	
Attitude/Orientation		*			*		

Regarding predictors for racial groups, criminal history and education/employment factors were reported as salient predictors for all racial groups. Besides such factors the companion and emotional/personal factors were common predictors for Whites and Blacks. While family/marital and attitude/orientation factors were reported as salient factors for the white offender group, leisure/recreation, accommodation, and alcohol/drug factors were convincing factors in explaining black offender's recidivism. As shown in Table 29, only two factors, criminal history and education/employment were significant factors for Hispanics. Although the LSI-R has been considered a culture-responsive inventory (Andrews & Bonta, 2003), the results of this study suggest there may be other promising predictors for different racial groups. Furthermore, it suggests that different treatment programs would be needed according to offender's race.

Along with identifying promising predictors of the subscales in the LSI-R, this dissertation examined salient factors among independent variables. The results support age, gender, offense type and LSI-R scores as promising factors in predicting recidivism. However, race did not reveal a significant relationship with recidivism.

This dissertation's findings suggest the possible utility of gender in developing risk assessment tools. Also, the relationship between age and recidivism has been well established in the literature (Flaherty, 2006; FLDOC, 2001) and was supported by the current findings. It was found that a one year increase of age showed 2.1% decrease in the odds of recidivism.

Implications of Research Findings

The findings of this dissertation found that the LSI-R is generally suitable for use among PADOC offenders of different races and genders. Comparisons on the LSI-R scores across gender and offense type groups revealed that gender has an impact on the LSI-R score by differentiating male risk scores from female risk scores. The gender disparity in the risk score difference confirmed the different recidivism rates between male and female offenders in this sample. Male offenders were 10% higher on the recidivism rate than female offenders.

Even though LSI-R score effectively differentiated higher recidivism rates among offender groups, however, the practical meaning of the LSI-R score still remains in question. Rather than arguing for a literal meaning of the risk score, it is necessary to better understand the practical difference of a one-unit increase in risk score. The relationship between a one-unit increase of risk score and a subsequent change of recidivism rates should be more clearly structured. In the same context, the interpretation

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of risk bands should be elaborated depending on the offender's demographic characteristics considering the fact that risk band provide more practical sense in classifying offenders than the LSI-R scores. The results suggest the different recidivism rates according to the feature of the formed groups. In order to develop reasonable cut-off scores for different offender groups, further research should identify the logical relationship between each risk band and recidivism rates.

Regarding the criminogenic factor structure of the LSI-R, this study failed to identify salient factors for the VFO. The results found that the ten LSI-R sub-components were not reliable predictors for the recidivism of the VFO group in this study sample. This finding also suggests that the risk factors for violent male offenders would be different from other offender groups. It raises an issue as to whether or not the LSI-R is a gender-responsive risk instrument. Feminist criminologists have argued that unique experiences and needs of female offenders should be included in risk assessment factors (Heilbrun et al., 2008).

The findings of this dissertation support a unique feature of the violent female offenders, suggesting that violent female offenders were more likely represented by female offenders following gendered pathways into crime. As Daly (1991) suggested, male-centered risk assessment tools cannot effectively predict recidivism for such female offenders. Daly's pathways framework appears to be a promising perspective to understand violent female offenders' criminality (Resig et al., 2006).

More importantly, the findings of this research lead to the argument that correctional programs should focus on valid risk factors depending on ethnic groups of offenders. Further empirical research should be conducted in identifying predictors of

recidivism with minority prison populations. Throughout such efforts, the identified promising predictors for each racial group should be considered in developing correctional programs.

Limitations

This study has several limitations.

First, because the data set was drawn only from the PADOC, external validity may present a limitation caused by the different judicial processes throughout the state of Pennsylvania. Even though over 900 correctional facilities in the United States has utilized the LSI-R as their major risk assessment tool, the classification procedures vary state by state. Thus, there is a possibility of different interpretation of the LSI-R scores depending on state's classification policy. The practical disparity in classification policies may cause a threat to the generalization of these findings.

Second, because the measure of recidivism that is adopted from the definition of the PADOC is quite broad, it is considered the least rigorous measure of all the possible recidivism measures. Kroner & Mills (2001) reported a different predictive validity of the LSI-R due to various definitions of recidivism such as reconviction or revocation of community supervision. Therefore, a more accurate measure of recidivism that reflects actual criminal behaviors needs to be developed.

Third, the follow-up period for recidivism varied from 24 to 36 months depending on the offender's time from release. The limitation relates to the uneven follow-up periods across the sample, which may influence the correlation between LSI-R and recidivism. Ideally, the follow-up period needs to be a precise amount of time for all offenders.

Fourth, as previous research has indicated the training and experience of interviewers can affect the reliability of the instrument and the score of the LSI-R (Lowenkamp, Latessa, & Holsinger, 2004). Even with standardized classification procedures of the PADOC, it is inevitable that this may lead to variations of offenders' risk scores by each interviewer. However, officials who are responsible in administering the LSI-R are known to be trained and also to follow the protocols in interviewing offenders.

Fifth, the division of violent-nonviolent crime, based only on the current offense, may impact on the relationship between offense type and the LSI-R score and recidivism. A more rigorous measure of offense type should be defined based on the past or current offense records. Thus, those who have ever been charged with a violent offense need to be classified into the violent group. Due to a lack of information about past criminal charges, this study used the current offense record for violent and non-violent categories.

Sixth, the female sample size was relatively small compare to the male sample size in the study, even though the gender ratio in the study sample was identical the gender composition of prison population. In particular, the small sample size of violent female offenders may cause differences in their risk scores, recidivism rates and result in failure in identifying promising predictors of ten LSI-R subscales. The increase of female sample size may cause different findings about their risk scores and recidivism rate.

Finally, although this study intended to investigate gender, offense type and racial impact on recidivism, the prison stay and participation in treatment programs automatically affect their recidivism rates. Since this study utilizes the initial risk scores to predict recidivism, treatment effects may be confounded with recidivism outcome,

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which may compromise the assessment of the predictive validity of the LSI-R. Based on the LSI-R assessment, intensive intervention would be administered for higher risk offenders, which may cause their low rate of re-offenses. The change of the risk scores from initial assessment by reassessment needs to be considered for further research.

Besides the limitations mentioned above, unexpected limitations may arise. As Kroner & Mills (2001) argued, risk assessment studies may face 'considerable unexplained variances' due to social and situational factors that affect violent and antisocial behavior.

<div align="center">Recommendations for Further Research</div>

This dissertation has several implications for future research. First of all, the findings demonstrate the importance of gender in assessing risk assessment. Future research should be conducted with various female offender populations in order to identify unique circumstances and to gain a better measure of risk assessment. In particular, risk assessment for violent female offenders should be reconsidered under a new paradigm such as gendered pathways to crime.

The findings of this study also suggest that ten subcomponents of the LSI-R need to be reconsidered depending on offenders' characteristics. Future research should further examine the risk and needs factors that are relevant to specific populations and improve criminogenic factors to more accurately predict offenders' recidivism. Furthermore, the findings of this dissertation suggest that future research needs to indentify problematic circumstances that lead up to offenders' criminal behaviors (Kroner, Mills, Reitzel, Dow, Aufderheide, & Railey, 2007). The accuracy of risk assessment would be improved by incorporating new background features into established criminogenic factors.

This study highlights a specific concern regarding the measurement of recidivism. A rigorous measure of recidivism is a major factor in determining the validity of risk assessment inventories. Research efforts need to be aimed at developing a more sophisticated concept of recidivism.

Finally, future research should make an effort to reflect the severity of offending in risk assessment practices, since most risk assessment inventories including LSI-R, do not assess the severity of offenses. This study attempted to reflect the severity of offending by using the category of violent and non-violent offender groups but an adequate measure of crime severity needs to be developed. Thus, risk scores will be more effectively represented based on the severity and the number of crimes committed.

Conclusions

Risk assessment research has been conducted to determine the validity of the inventory since the late 1980s. This study tested the validity of the LSI-R with male and female offenders. Overall, the results supported LSI-R as a valid risk assessment instrument regardless of gender and race. Research findings in existing literature have been used as primary support for the LSI-R as a gender and culture responsive inventory.

Nevertheless, the findings of this dissertation suggest caution in using the LSI-R to predict recidivism for violent and nonviolent female offenders. The results have clear implications for development of gender-specific risk assessment tools. With regards to female offenders and recidivism, the relative importance of later life events and earlier risk factors should be understood. Furthermore, given that violent offenders are of great concern in the criminal justice system, due to their high rates of recidivism, (Hollin &

Palmer, 2003), the unique criminogenic factors of violent offenders' should be investigated.

Statistical differences may not always guarantee the practical differences in the correctional setting. Therefore, understanding how a 1-point difference of the risk score affects the classification decision is still important. Without knowing the magnitude of the impact of one unit increase of the LSI-R score on the decision making procedure about offenders' placements, it is hard to determine the validity of the LSI-R for female offenders' classification practices.

Ultimately, accurate risk assessment inventories can improve security of the community, inmates' institutional adjustment and reintegration into the community. This dissertation provides new empirical evidence for risk assessment practices. Indeed, the development of theory and evidence based risk assessment tools is an important mission in corrections.

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THE LEVEL OF SERVICE INVENTORY-REVISED
By D. A. Anderws, Ph.D., and James L. Bonta, Ph.D.

Name: _____ Identifying Number: _____
Date of Birth: _____/_____/_____ Sex: M F Date: _____/_____/_____
Referral Source: _____ Reason for Referral: _____
Disposition: _____ Present Offenses: _____
_____

The LSI-R is a quantitative survey of attributes of offenders and their situation relevant to the decision regarding level of service. The LSI-R is composed of 54 items. Items are either in a "yes-no" format, or in a "o-3" rating format, based on the following scale:

3: A satisfactory situation with no need for improvement
2: A relatively satisfactory situation, with some room for improvement evident
1: A relatively unsatisfactory situation with a need for improvement
0: A very unsatisfactory situation with a very clear and strong need for improvement

Place an "X" over the appropriate response for each question, whether it be a simple "yes" or "no", or a rating number. The answers will transfer through to the scoring sheet beneath for quick tallying of the LSI-R score. Be sure to see the manual for guidelines on rating and scoring. For missing information, circle the question number.

Criminal History

No	Yes	1. Any prior adult convictions? Number: _____
No	Yes	2. Two or more prior adult convictions?
No	Yes	3. Three or more prior adult convictions?
No	Yes	4. Three or more present offenses? Number: _____
No	Yes	5. Arrested under age 16?
No	Yes	6. Ever incarcerated upon conviction?
No	Yes	7. Escape history from a correctional facility
No	Yes	8. Ever punished for institutional misconduct? Number: _____
No	Yes	9. Charge laid or probation/parole suspended during prior community Supervision
No	Yes	10. Official record of assault/violence?

Education/Employment

When in labor market:

No	Yes	11. Currently unemployed?
No	Yes	12. Frequently unemployed?
No	Yes	13. Never employed for a full year?
No	Yes	14. Ever fired?

School or When in school:

No	Yes	15. Less than regular grade 10?
No	Yes	16. Less than regular grade 12?
No	Yes	17. Suspended or expelled at least once?

For the next three questions, if the offender is a homemaker or pensioner, complete # 18 only. If the offender is in school, working, or unemployed, complete #18, #19 and #20. If the offender is unemployed, rate 0.

3	2	1	0	18. Participation/performance
3	2	1	0	19. Peer interaction
3	2	1	0	20. Authority interaction

Financial

3	2	1	0	21. Problems
No	Yes			22. Reliance upon social assistance

Family/Marital

3	2	1	0	23. Dissatisfaction with marital or equivalent situation
3	2	1	0	24. Non-rewarding, parental
3	2	1	0	25. Non-rewarding, other relatives
No	Yes			26. Criminal-Family/Spouse

Accommodation

3	2	1	0	27. Unsatisfactory
No	Yes			28. 3 or more address changes last year
No	Yes			29. High crime neighborhood

Leisure/Recreation

No	Yes			30. Absence of recent participation in an organized activity
3	2	1	0	31. Could make better use of time

Companions

No	Yes	32. A social isolate
No	Yes	33. Some criminal acquaintances
No	Yes	34. Some criminal friends
No	Yes	35. Few anti-criminal acquaintances
No	Yes	36. Few anti-criminal friends

Alcohol/Drug Problem

No Yes	37. Alcohol problem, ever	
No Yes	38. Drug problem, ever	
3 2 1 0	39. Alcohol problem, currently	
3 2 1 0	40. Drug problem, currently	Specify type of drug _____
No Yes	41. Law violation	
No Yes	42. Marital/Family	
No Yes	43. School/Work	
No Yes	44. Medical	
No Yes	45. Other indicators	Specify _____

Emotional/Personal

No Yes	46. Moderate interference
No Yes	47. Severe interference, active psychosis
No Yes	48. Mental health treatment, past
No Yes	49. Mental health treatment, present
No Yes	50. Psychological assessment indicated Area: _____

Attitudes/Orientation

3 2 1 0	51. Supportive of crime
3 2 1 0	52. Unfavorable toward convention
No Yes	53. Poor, toward sentence
No Yes	54. Poor, toward supervision

APPENDIX B

PADOC POLICY STATEMENT: RECEPTION AND CLASSIFICATION
(Policy Number 11.2.1., Effective Date: April 1, 2003)

I. AUTHORITY
The Authority of the Secretary of Corrections to direct the operation of the Department of Corrections is established by Sections 201, 206, 506, and 901-B of the Administrative Code of 1929, 71 P.S. §§61, 66, 186, and 310-1, Act of April 9, 1929, P.L. 177, No. 175, as amended.

II. PURPOSE
The purpose of this document is to establish policy and procedures for the reception and classification of offenders committed to the Department of Corrections.

III. APPLICABILITY
The policies and procedures set forth in this document shall apply to all staff and offenders under the custody of the Department.

IV. DEFINITIONS
  A. Classification
    The classification process is a systematic study of the individual offender that include:

      1. a complete evaluation of the individual's past development, present needs and behavior, and potential for change;

      2. use of this information to develop the individual's resources for social reintegration; to provide a realistic, coordinated program of security, custody, treatment, training, facility work, and housing assignments; and

      3. organization of staff and establishment of procedure so all available resources can be directed toward furthering the individual's endeavour to assume a productive role in society.

  B. Custody Level
    A term used to describe the degree of staff supervision and control necessary to monitor the behavior of and inmate. Custody levels are CL-1, Community corrections; CL-2, Minimum; CL-3, Medium; CL-4, Close; and CL-5, Maximum as defined by the Pennsylvania Additive Classfication Tool (PACT) System.

  C. Initial Classification
    Collections of data, assessment of treatment, custody, and security needs, definition of remedial goals, and determination of housing placement for inmates newly received into the Department of Corrections or who have been absent from Department facilities for a year or longer.

D. Pennsylvania Additive Classification Tool (PACT)
   The instrument for ascertaining appropriate custody levels for inmates is designed to be objective and behavior drive in that a "just desserts" model dictates offenders' custody levels. Classification decision-making is centralized, monitored, and controlled through an automated data system by Central Office of Classification Personnel. The systems is designed to reduce over-classification of offenders resulting in the placement of inmates in the least restrictive security level based on an objective assessment of his/her custody needs.

E. Reception
   Reception includes an initial case study and report performed by a corrections team skilled in the area of social work, psychology, psychiatry, academic and vocational education, counseling, religion, and custody. Equally significant in this process is the individual's orientation to facility life, introduction to program procedures, and initial preparation for release.

F. Reclassification
   Update of existing classification data.
   All pertinent definitions are contained in the procedures manual for this policy.

V. POLICY
   It is the policy of the Department of Corrections to ensure that each offender committed to the custody of the Department is classified via the Pennsylvania Additive Classification Tool (PACT) and assigned a corresponding Custody Level.

VI. Procedures
   A. Each inmate committed to the custody of the Department of Corrections shall be initially classified upon reception and re-classification annually as part of the inmate's annual review process.

   B. Each inmate shall be assigned one of the following Custody Levels as determined by the Pennsylvania Additive Classification Tool (PACT):

   (1) **Custody Level 1** – The level assigned to inmates meeting the requirements and approved for pre-release programming. These inmates present the least risk to the community according to his/her level and type of criminal behavior, has stable facility adjustments characterized by a lack of non-compliant, assaultive behavior, and who benefit most from involvement in pre-release programs.

   (2) **Custody Level 2** – The level assigned to inmates who demonstrate patterns of non-aggressive behavior. These inmates are candidates who may be permitted to leave the facility perimeter for work and program assignments that are on facility property or at sites under the control of the Department. Within the facility perimeter, the inmate is generally permitted unrestricted movement in

designated areas of the facility. There inmates require only intermittent, direct observation by staff.

(3) **Custody Level 3** – The level assigned to inmates who are permitted reasonable freedom of movement within designed areas of the facility perimeter. These inmates exhibit behavior that is generally non-assaultive within the facility perimeter, but may cause risk to the public should he/she be permitted outside of the facility. These inmates are permitted access to most jobs and programs within the facility. Parole violators pending are generally assigned to this level. These inmates require frequent, direct supervision.

(4) **Custody Level 4** – The level assigned to those inmates who require a high degree of supervision. These inmates are individuals who, through a demonstrated pattern of maladjustive behavior, need continuous direct and indirect supervision. These inmates' behavior is such that they may be occasionally assaultive within the facility perimeter and are viewed as a definite risk to the public outside of the perimeter. These inmates are permitted access to selected programs and jobs within the facility perimeter and are under constant observation and/or escort when moving throughout the facility individually or in groups. Newly received inmates who are unclassified are assigned to this level.

(5) **Custody Level 5** – This level is assigned to those inmates who have demonstrated, through a pattern of maladjustive, assaultive behavior, or through a need for protection that they require a high degree of structure. They require continual direct and indirect supervision by staff. These inmates are afforded the opportunity to participate only in selected programs in he/her cell or in small, controlled, highly supervised groups on the housing unit. They are inmates who either would pose a high level of risk to others or may be at risk themselves if permitted access to general population areas. When out of his/her cell, he/she is always under escort, except as otherwise permitted by the Program Review Committee. They receive visits only in the housing unit, or designated secure areas and the visits are non-contact. Custody level 5 is the most restrictive level and inmates assigned to this level should be housed in units with security level rating of 5.

The further information that may be not relevant to this study is not provided.

FREQUENCY AND PERCENTAGE FOR THE ORIGINAL DATA SET

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	13,598	93.0	93.0	93.0
	Female	1,021	7.0	7.0	100.0
	Total	14,660	100.0	100.0	
Race	White	5,421	37.1	37.1	37.1
	Black	7,353	50.3	50.3	87.4
	Hispanic	1,777	12.2	12.2	99.7
	Others	68	.5	.5	100.0
	Missing	1	.0	.0	
	Total	14,620	100.0	100.0	
Offense Type	Nonviolent	9,280	63.5	63.5	63.5
	Violent	5,340	36.5	36.5	100.0
	Total	14,620	14,620	100.0	
Recidivism	No	8,559	58.5	58.5	58.5
	Yes	6,061	41.3	41.5	100.0
	Total	14,620	100.0	100.0	

Descriptive Statistics for the Original Data Set

	N	Minimum	Maximum	Mean	Std. Deviation
Age	14,619	17.00	91.00	35.3371	9.99531
IQ	14,313	48	155	91.48	13.284
Education	14,423	0	20	11.03	1.827
LSI-R Score	12,975	.00	51.00	26.1527	7.80943
Male	12,038	.00	51.00	26.2414	7.76377
Female	937	2.00	48.00	25.0139	8.2944

APPENDIX D

QUALITATIVE DESCRIPTIONS OF WAIS-III FULL SCALE IQ SCORES

IQ Score	Classification	Percent Included	
		Theoretical Normal Curve	Actual Sample
130 and above	Very super	2.2	2.1
120-129	Superior	6.7	8.3
110-119	High Average	16.1	16.1
90-109	Average	50.0	50.3
80-89	Low Average	16.1	14.8
70-79	Borderline	6.7	6.5
69 and below	Extremely Low	2.2	1.9

(Wechsler Adult Intelligence Scale-III, Wechsler, 1999, p.25)

APPENDIX E

ANOVA TEST BY GENDER AND OFFENSE TYPE

		Sum of Squares	df	Mean Square	F	Sig.
Edu	Between Groups	3.107	3	1.036	.341	.796
	Within Groups	39400.002	12967	3.038		
	Total	39403.109	12970			
IQ	Between Groups	9626.650	3	3208.883	18.409	.000
	Within Groups	2247244.877	12892	174.313		
	Total	2256871.527	12895			
Age	Between Groups	5529.357	3	1843.119	19.562	.000
	Within Groups	1222127.025	12971	94.220		
	Total	1227656.382	12974			

LSI-R SCORES FOR RECIVISTS VS. NON-RECIDIVISTS

	Non-recidivism (n=8248)		Recidivism (n=4727)			
	M	SD	M	SD	t	Sig.
Criminal History	5.76	2.083	6.27	1.936	13.712	.000
Education/Employment	6.30	2.245	6.75	2.037	11.222	.000
Financial	.91	.769	.95	.753	2.726	.006
Family/Marital	1.34	1.158	1.42	1.174	3.726	.000
Accommodation	.76	.854	.88	.905	7.698	.000
Leisure/Recreation	.97	.889	1.05	.893	5.383	.000
Companions	2.62	1.385	2.85	1.288	9.217	.000
Alcohol/Drug	4.36	2.566	4.73	2.454	8.045	.000
Emotional/personal	1.52	1.430	1.48	1.390	-1.845	.065
Attitude/orientation	.98	1.268	1.02	1.256	2.020	.043
LSI-R Total	25.4677	8.02882	27.3535	7.24871	13.332	.000

Independent Sample T-Test by Recidivism

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval	
		F	Sig.	T	Df	Sig.	Mean Difference	Std. Error Difference	Lower	Upper
LSI-R	Equal variances assumed	67.247	.000	13.332	12973	.000	1.8857	.14145	1.6084	2.1630
	Equal variances not assumed			13.706	10681.92	.000	1.8857	.13759	1.6160	2.1554

GROUP DIFFERENCES OF RECIDIVISM

		Gender * Offense Type				
		VMO	NMO	VFO	NFO	Total
Recidivism	No=0	2897	4676	213	462	8248
	Yes=1	1630	2835	54	208	4727
Total		4527	7511	267	670	12975

Chi-Square Tests			
	Value	Df	Sig. (2-sided)
Pearson Chi-Square	44.623[a]	3	.000
Likelihood Ratio	47.697	3	.000
Linear-by-Linear Association	5.861	1	.015
N of Valid Cases	12975		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 97.27.

APPENDIX H

ANOVA TEST BY RACE

		Sum of Squares	Df	Mean Square	F	Sig.
Edu	Between Groups	2534.861	2	1267.431	447.669	.000
	Within Groups	36547.707	12909	2.831		
	Total	39082.569	12911			
Recidivism	Between Groups	2.122	2	1.061	4.581	.010
	Within Groups	2990.581	12913	.232		
	Total	2992.703	12915			
IQ	Between Groups	245502.709	2	122751.354	787.667	.000
	Within Groups	2000071.740	12834	155.842		
	Total	2245574.449	12836			
LSIR_Tot	Between Groups	692.400	2	346.200	5.692	.003
	Within Groups	785451.958	12913	60.826		
	Total	786144.358	12915			
Age	Between Groups	8758.010	2	4379.005	46.595	.000
	Within Groups	1213573.560	12913	93.981		
	Total	1222331.570	12915			