

# Offender Gender, Mental illness and Trauma Experience in Relation to Re- Contact with the Criminal Justice System

by

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## Abstract

Female offenders' experiences within the criminal justice system and the way in which they become involved with the criminal justice system are very different than that of male offenders. Previous research that has been conducted on female offending does show that womens' contact with the criminal justice system can often be related to histories of abuse and to mental illness, and that these can also be related to subsequent re-contacts with the criminal justice system.

Abuse, mental illness and gender, along with control variables (age, aboriginal identity, LSI-OR score), were investigated in a sample of 522 male and female Ontario Provincial offenders. When males and females were compared at the bivariate level using a chi-square comparison, females were found to be significantly more likely to re-contact. Abuse and mental illness were not found on their own to be significantly related to re-contact, but when the relationship between the three variables was examined, mental illness was found to be both significant and positively correlated to both gender and abuse. Examination into the relationship between the variables found a strong relationship between gender and abuse, gender and mental illness, mental illness and abuse as well as strong relationship in the three way interaction between gender, mental illness and abuse. The cross tabulation demonstrated that women who had experienced abuse were identified as being much more likely to be suffering from a mental illness.

Logistic regression was used to model the relationship between re-contact, gender, abuse and the risk for re-contact. All possible interactions (as noted above) were included in the model, but the model that best fit the data included only the controls (age, aboriginal identity, LSI-OR score), gender, abuse, mental illness and the interaction between mental illness and gender. Results indicated that there was a significantly higherrisk for re-contact for females with mental illness, compared with men with mental illness or or to men and women without mental illness.. Even though abuse as a single variable or as part of an interaction was not found to be significantly related to re-contact, it is still of importance to note that the chi-square comparisons demonstrated that abuse is significantly related to gender and mental illness, therefore the relationship was still important when looking at the implications of the research.

It is recommended that future research further investigate the different needs of male and female offenders and the role that experienced physical, sexual and emotional abuse, mental illness and

gender plays in not only offending behaviour, but in the treatment and rehabilitation of offenders within the provincial correctional system.

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## Table of Contents

AUTHOR'S DECLARATION.....	ii
Abstract.....	iii
Acknowledgements.....	v
Table of Contents.....	vi
List of Figures.....	viii
List of Tables.....	ix
Chapter 1 Introduction.....	1
Chapter 2 Literature Review.....	8
2.1 Introduction.....	8
2.2 Literature Review.....	9
2.3 Relationship Between Mental Illness and Criminality.....	12
2.3.1 Criminality and Mentally Ill Offenders.....	12
2.3.2 Substance Abuse and Mental Illness.....	13
2.3.3 Gender, Mental Illness and Criminality.....	14
2.3.4 Mental Illness among Male and Female Offenders.....	16
2.4 Abuse, Trauma and Mental Illness.....	18
2.5 Gender, Abuse, Trauma and Mental Illness.....	20
2.6 Mental Illness and Recidivism.....	21
2.6.1 Proposing a Pathway from Abuse to Criminal Involvement.....	24
2.6.2 Proposed Pathway and Gender Differences.....	27
2.7 Conclusion.....	29
Chapter 3 Methods and Data.....	31
3.1 Introduction.....	31
3.2 General Approach.....	32
3.3 Data.....	33
3.3.1 Mentally Disordered Offender Project.....	34
3.3.2 Measuring Mental Health.....	35
3.3.3 Data Limitations: MDO data.....	37
3.3.4 Offender Tracking Information System (OTIS) and Level of Service Inventory (LSI-OR).....	39
3.3.5 Data Limitations: OTIS/LSI-OR Data.....	41
3.4 Methods.....	43

3.4.1 Logistic Regression .....	43
3.4.2 Goodness of Fit, Classification and ROC Curve Analysis .....	44
3.5 Data Recoding and Manipulation .....	45
3.5.1 MDO Data .....	45
3.5.2 Propensity Score Weighting .....	46
3.5.3 Independent Variables: Total LSI-Score .....	48
3.5.4 Independent Variables: Mental Illness, Gender and Abuse.....	48
3.5.5 OTIS/LSI-OR Data.....	54
3.6 Models .....	56
3.7 General Limitations .....	57
3.8 Conclusion.....	58
Chapter 4 Results.....	59
4.1 Introduction .....	59
4.2 Baseline Risk Factors for Re-Contact .....	60
4.3 Univariate Analysis .....	61
4.3.1 Gender, Mental Illness and Abuse History.....	62
4.4 Bivariate Analysis .....	65
4.4.1 All Risk Factors as they Relate to Re-contact.....	65
4.4.2 Bivariate Analysis of Gender, Abuse and Mental Illness.....	67
4.5 Creating the Final Model.....	69
4.5.1 First Steps .....	69
4.5.2 Next Steps.....	72
Chapter 5 Discussion.....	84
5.1 Discussion.....	84
Chapter 6 Recommendations and Conclusion.....	92
6.1 Recommendations .....	92
6.2 Conclusion.....	94
Bibliography.....	96
Appendix A Scale Reliability .....	111
Appendix B Presentation of Models with Weighted and Unweighted data .....	115
Appendix C Interactions.....	117
Appendix D Propensity Weighting.....	118

## List of Figures

Figure 1: Proposing a Pathway from Abuse to Criminal Involvement .....	24
Figure 2: Change in Deviance Plot - Control Variables Only in Model.....	71
Figure 3: ROC Curve - Control Variables .....	72
Figure 4: Relationship between Re-Contact and Gender and Abuse.....	74
Figure 5: Relationship between Re-Contact and Gender by Mental Illness .....	75
Figure 6: Cook's Distances vs. Predicted Probabilities - Model 5 .....	78
Figure 7: Change in Deviance vs. Predicted Probabilities - Model 5 .....	79
Figure 8: Final Model - ROC Curve .....	80
Equation 1: Propensity Weighting .....	47



## List of Tables

Table 1: Sample Offender Characteristics (Sentenced vs. Remand and Other) by Data Collection Method .....	42
Table 2: Frequency of Moderate and Severe Mental Illness: MDO Data vs. MDO Weighted Sample .....	51
Table 3: Frequency of Abuse : MDO Data vs. Weighted Sample.....	53
Table 4: Final Proposed Model which includes Gender, MI and Abuse as Independent Variables as well as Interactions .....	57
Table 5: Comparison of MDO Project Sample and LSI-OR/OTIS Sample .....	62
Table 6: Gender, MI, and Abuse Histories Variables of MDO Project Sample vs. LSI-OR/OTIS Sample .....	63
Table 7: Re-contact: MDO Sample and LSI-OR/OTIS Sample Compared .....	65
Table 8: Correlation with Re-contact – MDO Data .....	66
Table 9: Bivariate Relationship Between Dichotomous Covariates and Re-contact – MDO Data .....	67
Table 10: Results of Crosstabular Analysis of Abuse, Gender and Mental Illness .....	68
Table 11: Results from Logistic Regression Analysis – First Model with Control Variables .....	70
Table 12: Model Comparison: Addition of Gender, Mental Illness and Abuse .....	77
Table 13: Final Model: Model 6 – Logistic Regression Model of Re-Contact .....	81
Table 14: Scales Imbedded within Final Model – Mental Health .....	111
Table 15: Scales Imbedded within Final Model – Abuse .....	114
Table 16: Comparison of Logistic Regression Models with Unweighted data vs. Weighted Data ..	115
Table 17: Logistic Regression Models for Re-contact with Various Interactions Included .....	116



# Chapter 1

## Introduction

The number of women in the Canadian prison population is growing. Correctional Services Canada reported in 2002 that the female offender population had increased by 12.3% in recent years. Yet even with this significant increase, the total number of Canadian female offenders only account for 4% of the total Canadian prison population (Laishes, 2002). Therefore, even though there has been growth in numbers, the gap between male and female offenders does not seem likely to close anytime soon. The underrepresentation, or small stake women offenders hold within the correctional system is the main reason for a lack of appropriate programs and services for women in prison.

To date, research has focused mainly on male offenders, as their burden on the correctional system is far greater than that of female offenders. While the amount of research on female offenders has grown recently, many aspects of female offending remain poorly understood. This lack of understanding of the context of female offending limits potential for rehabilitation, and therefore results in subsequent returns to custody. A meta-analysis conducted by Dowden and Andrews (1999) supported the fact that there is much less attention paid to the effective treatment of female offenders and that further research is necessary in order to improve the treatment of female offenders within the criminal justice system.

If women account for such a small proportion of the total Canadian offending population, why focus on them? The literature that will be presented below demonstrates that female offenders have unique life experiences which affect their life courses. If programming that male offenders receive is based on research done with male offenders, it seems appropriate that the programming or rehabilitative efforts for female offenders are based on research conducted on female offenders. This becomes an issue of gender inequality if the appropriate needs/rehabilitation efforts of male offenders

are viewed as more important to focus on than the development of appropriate rehabilitation/programming for female offenders.

When researching female offenders, it is of particular importance to understand the typical characteristics of female offenders, including their age, education, and socioeconomic status, and the rates at which they are suffering from a substance abuse history, prior victimization history and a mental illness. The literature that will be presented points to the potential that these characteristics and experiences may be linked to eventual criminality.

Female offenders tend to be young, and to have low socioeconomic status, low levels of education and have at least one dependent (Hartwell, 2001). There is also evidence that significant percentages of incarcerated women have are more likely to be suffering from mental illness, especially depression and that they have experienced abuse at some point in their lives (Hartwell, 2001; Mazure, Keita & Blehar, 2002).

A Canadian study done by Brink, Doherty and Boer (2001) found that one-third of female offenders had a mental health disorder upon entry into the Canadian federal correctional system. Correctional Services Canada (CSC) also reported in 2002 that women outnumber men in almost all mental health diagnoses and that incarcerated versus non-incarcerated women in Canada are twice as likely to be suffering from depression and that they are three times as likely to be suffering from severe or mild depression as compared to male offenders (Laishes, 2002). Also often linked to offender mental illness is the abuse of substances. In the CSC report they found that 69% of the women had abused substances (Laishes, 2002).

The high prevalence of mental illness among incarcerated females has been reported for the United States, New Zealand and the United Kingdom population, as well as the Canadian correctional population (Laishes, 2002; Ross, 1998; Brinded et al, 2001; UK Department of Health, 1997). Compared to men and the general female population, women in conflict with the law are more likely

to have various psychological needs (Cox, 2009). Because of the high prevalence of mental illness among female offenders, it is now considered to be one of the major contributing factors in criminality among women. Suffering from mental illness not only may result in an initial contact with the criminal justice system, but also increase the chances of being re-incarcerated, usually for probation violations and petty crimes (Mitchell, 1988).

Women in the CSC report (2002) also had a very high rate of prior victimization. 80% of the women reported that they had been physically, sexually or emotionally abused. A study by McClellan, Farabee & Crouch (1997) also found high rates of victimization among female offenders, with 69% of female offenders reporting physical abuse, and 54% reporting sexual abuse. In this study it was also found that compared to the male offending population, women were more likely to have been physically, emotionally or sexually abused as adults (McClellan, Farabee & Crouch, 1997). When comparing the rates of victimization among the Canadian female correctional population and the American correctional population, the rates are quite similar. Canadian and American women offenders not only exhibit a greater number of symptoms of mental illness than men, but their rates of victimization are double that of the general female population (Hartwell, 2001; Mazure, Keita & Blehar, 2002; Shaw, 1991).

Victimization, particularly in childhood, may be related to mental illness, and to offending, in adulthood. Women who have suffered from victimization may suffer from ongoing psychological effects (Chesney-Lind & Sheldon, 1992; Cox, 2009; Daly, 1994; Gilfus, 1992; Widom, 1989). The abuse that many female offenders experience and the psychological effects that abuse may cause, may hinder offenders' willingness and ability to make changes to their life situations. One major consequence of the experienced victimization is Posttraumatic Stress Disorder (PTSD). In a report by the Ontario Ministry of Community Safety and Correctional Services (MCSCS), it was indicated that about 50% of women who had experienced abuse at some point in their lives had long and lasting

PTSD (Cox, 2000), and further, 30 to 50% of incarcerated women have PTSD while incarcerated (Cox, 2000; Zlotnick, 1987).

The experience of victimization has not only been linked to the development of mental health problems among women, but also linked with a women's involvement with the criminal justice system. (Haywood et al, 2000; Sigel & Williams, 2003; Browne, Miller & Maguin, 1999; Widom and Ames, 1994; Covington, 1998), Battle et al (2003) addressed the influence of PTSD caused by victimization on female criminality. They found that the posttraumatic stress disorder in adulthood caused by abuse experienced in childhood might lead to drug use as a means for self-medication. In addition, the issues surrounding mental illness, in combination with the substance abuse and increased risk taking behaviour, leads to criminal involvement, most often prostitution (Battle et al, 2003).

Browne, Miller and Maguin addressed the link between trauma and female incarceration and found links between the long-term effects of violence by a close family member or friend and the reasons for criminality among females (1999, pp. 303). Making similar links, the Ministry of Community Safety and Correctional Services (MCSCS) developed a model of women's pathway to crime, which also addressed the part that abuse plays on eventual criminality (Cox, 2009).

The first connection that Browne, Miller and Maguin (1999) made between female incarceration and trauma is that there is an association between histories of abuse and drug or alcohol dependency. Women who have been abused either physically or sexually by a family member are at a much higher risk for addiction problems as adults, and little attention has been paid to drug use as a possible secondary effect of early abuse. Drug and alcohol dependency can place both youth and adults within a criminal subculture. The MCSCS report also supported substance abuse as a pathway to crime, as drugs and alcohol are used as a coping mechanism to numb various emotional pains (Cox, 2009).

The second link is that girls who come from abusive homes are at a much higher risk of connection to the criminal justice system, often after having left home to escape abuse. Snell (1992) found that female offenders who suffer from abuse are likely to experience a lack of parental involvement in their lives and to have been abused before age 18. They may run away from the situation, but may also not have the ability to survive on their own. These girls become a much higher risk for being involved with drug or criminal related activities. The MCSCS report agreed, stating that leaving home at such an early age leaves the girl in a tough economic situation; therefore criminal activity becomes their way of economic survival (Cox, 2009). Ultimately, the experience of severe abuse or neglect as a child may put the victim at much greater risk for arrest as juveniles and into adulthood. Siegal and Williams (2003) supported this link, as they believed that abuse as a child started the pathway to delinquency and eventual repeat offending (Belknap, 2001; Browne et al., 1999; Daly, 1992; Pollock, 1999; Widom, 2000; Widom and Ames, 1994; Green et al. 2005).

Another link made between trauma and the incarceration of women is a tendency of abused women to be involved with criminally involved violent partners. This is often related to the abuse of drugs. These women are not only more likely to be in a situation where they are required to defend themselves or a child from an abusive partner, but they are more likely to have knowledge of crimes being committed, or to be involved with those crimes as their partners are often involved in criminal activities. The MCSCS also supports this link by stating that relationships play a major part in women's criminal involvement (Cox, 2009).

A final factor that is highly related to female offending is the need for food and shelter for daily survival. In addition to the link between mental illness and abuse, criminality among female offenders is often attributed to this need for the day-to-day necessities of life. Whether their problems are economic, psychological or substance abuse, female offenders, and especially those with mental illness, often have problems coping when they are released. It is often difficult for them to find a

place to live, find employment, manage medication, manage money and, in addition often abuse drugs as a coping mechanism (Hartwell, 2001).

The high rates of mental illness and experiences of abuse are two problems dealt with by many women offenders. In order to reduce the chance of women re-offending, the effects of mental illness and the experience of abuse may be important to recognize. If the experiences that have contributed to their offending behaviour are not addressed, then the chances of re-contact with the criminal justice system may become quite high. The reasons and risk factors that contribute to female criminality and re-offending do not often receive much attention, and the present paper attempts to contribute to this area of research by adding to the lack of literature available, as well as highlighting the unique needs of female offenders in the hopes to create positive change for women within the Canadian correctional system. Additional research on the characteristics and criminality of female offenders would be significant in order to further identify the possibility of a link between trauma/victimization, mental illness and criminal activity.

In a study conducted by Gendreau, Andrews, Goggin and Chanteloupe (1992), 400 studies which predicted recidivism among offenders were reviewed. Out of 1,734 individual predictor and outcome items, only 46 focused on female offenders. These predictors of recidivism are the basis for the development of risk assessment tools as well as rehabilitation programs. Unfortunately, there has been very little validation research done on the tools used to measure offender recidivism and how they are applicable to female offenders. Specific risk factors for female recidivism should be directly related to programming and rehabilitation so that it is gender specific effective. Providing valid treatment is compromised when these risk factors are not researched. The focus of rehabilitation and programming should be to return the offender back into the community with a reduced risk of recidivism. The lack of research on women's experiences, such as previous victimization, substance



abuse and mental illness, and how they are related to criminality and recidivism casts considerable doubt on the effectiveness of these programmes.

In order to address this issue, this paper analyses mental health and recidivism data from an Ontario provincial offender population. Using the Resident Assessment Instrument – Mental Health (Hirdes et al., 2002), 522 male and female offenders were interviewed about their specific mental health needs. In addition to information regarding their mental health histories and past histories of abuse, data were also collected for their offence histories and a follow-up was done to identify offenders who had been in re-contact with the criminal justice system. These data provide an opportunity to better understand the connections between mental illness and recidivism among female offenders, and what role abuse plays in relation to mental illness, as well as recidivism. This thesis addresses the question of whether there is a significant difference between male and female offenders in regards to re-contact with the criminal justice system and, more specifically, if there is a gender difference between male and female mentally ill offenders and re-contact. In addition, it examines whether a past history of abuse is significantly related to offender mental illness, and if there is a gender difference between male and female trauma victims.

In the following sections, extensive discussion of the relevant literature will be followed by the methods that will be used in order to address the research problem.

## Chapter 2

### Literature Review

#### 2.1 Introduction

There are several misconceptions about people with mental illness, including that that they are dangerous, violent, and should be feared. These misconceptions are reinforced by movies, television shows and news programs that often portray people with mental illness as in frequent constant contact with the criminal justice system.

Do the mentally ill actually have greater criminal potential than others? The number of persons suffering from mental illness within the Canadian correctional system has been increasing (Powell et al., 1997). Persons suffering from mental illness have also been found by various studies to commit multiple offences, and be more prone to recidivism after release, than the general offending population (Feder, 1991; Silver, Cohen & Spodak, 1989; Jacoby & Kozie Peak, 1997; Wilson, Tien & Eaves, 1995; Hartwell, 2003).

However, it is not clear if these patterns are due to a greater criminal potential among the mentally ill (Powell et al., 1997). Rather, it is possible that those with mental illness are simply more likely to come in contact with the criminal justice system and, once in contact, are more likely to be in contact again. Those with mental illness may cycle in and out of the criminal justice system because of a lack of appropriate treatment, rather than a truly greater tendency toward criminal behaviour.

A potentially important aspect of the connection between mental illness and involvement in the criminal justice system is childhood abuse. Up to 80 percent of the North American offender population may have experienced childhood sexual or physical abuse (Peugh & Belenko, 1999; Bloom, Owen & Covington, 2003). Prior research indicates a relationship between childhood abuse and adult mental illness (Anda et al., 2002; Mulder et al., 1998; Santa & Gallop, 1998; Kendler et al., 2000; Caron et al., 1998; Molnar et al., 2001), suggesting that involvement within the justice system

may be connected to these past experiences, through mental illness. If there is a connection between childhood trauma and mental illness, and mentally ill persons have an increase risk of coming into contact with the criminal justice system, there may be a causal pathway that leads from abuse and trauma in childhood, to adult mental illness and then eventual contact with the criminal justice system leading to an increased risk for additional re-contact.

These pathways are important to understand. Effective rehabilitation requires understanding the real causes of criminal behaviour, and providing adequate treatment for offenders with mental illness also requires that we take into account the causes of that illness. Gender differences in the experience of abuse and mental illness are also potentially important for understanding different patterns of criminal involvement and recidivism. There is evidence that childhood abuse might be more predictive of mental illness among women (Peugh & Belenko, 1999; Spatz Widom & White, 1997; McCormack 1986; Molnar et al., 2001) and that female offenders are more likely than male offenders to experience a mental illness. Given the growing population of female offenders in Canada, and the lack of programming specifically aimed at women, (Globe & Mail, January 27, 2011; Chesney-Lind & Pasko, 2004; Barker, 2009), it is important to know whether the pathways between mental illness, criminality and recidivism are the same for women and men.

In this chapter, we will examine the association between mental illness, criminality and recidivism, and the differences in patterns of recidivism among mentally ill male and female offenders. As well, we will investigate whether prior experience of abuse is a significant predictor of mental illness in this population.

## **2.2 Literature Review**

There is a growing number of people with mental illness in both the Canadian and the United States correctional systems. While there has been a lack of consensus about the reason for this growth, it is generally agreed that the problem is only getting worse (Powell et al., 1997). In the

United States, it is estimated that anywhere from six to 20 percent of the prison population suffers from mental illness (Gagliardi et al., 2004). Canadian studies report similar rates, with some reporting estimates closer to 30 percent (Motiuk and Poropino, 1991; Bland et al., 1990; Roesch, 1995; Gingell, 1991).

One proposed reason for the increase of people with mental illness in jail is deinstitutionalization. In 1960, the era of the asylum ended, and, as Brown and Hoffman (2007) state, “the role of asylums and mental hospitals in the social control of ‘undesirables’ in society, including homosexuals, political dissidents, the developmentally disabled, the homeless and the mentally ill came under scathing attack.” The result of this attack was deinstitutionalization of the mentally ill in the U.S. and Canada which, in theory, was supposed to be a positive shift in care, replacing long-stay hospital admissions with shorter, less isolated community based alternatives (Lamb & Bachrach, 2001).

To give perspective on the number of mentally ill individuals released into the community; in 1955, the number of occupied state hospital beds in the U.S. was 339 per 100,000 population. By 1996, this number had been reduced to 21 occupied state beds per 100,000 (Lamb & Bachrach, 2001), and it is expected that deinstitutionalization in Canada has had similar effects.

The intention of deinstitutionalization was to improve the living conditions and autonomy of people with mental illness. In order for this to occur, however, there would have needed to have been adequate and accessible community alternatives to hospitalization. A problem that arose was that community care was not as accessible as it should have been (Lamb & Bachrach, 2001; Okin, 1978). Deinstitutionalization has been partly blamed for a large number of mentally ill persons becoming homeless. Employment and vocational programs were no longer available, and living on the streets increased the potential for mentally ill individuals coming into close contact with narcotics. The

negative combination of drugs and mental illness could lead to bizarre behaviour increasing the risk of coming into contact with the police (Lamb & Bachrach, 2001; Kupers, 1999).

Another explanation for the increasing numbers of mentally ill persons coming into contact with the criminal justice system is that mental illness is increasingly likely to be criminalized (Corrado et al., 2000). Due to society's seeming unwillingness to tolerate people with mental illness, the criminal justice system has become increasingly responsible for them, due to the lack of services available within the health care system. In large urban centers such as Vancouver, the pressure being put on the police to handle people suffering from mental illness in the downtown core has resulted in what Corrado and colleagues (2000:5) refer to as the "widening of the criminal justice net". Many mentally ill persons, often homeless and living in the downtown core, had been often ignored by both the mental health and criminal justice systems. But, in an effort to 'clean up' the streets in Vancouver, Corrado and colleagues state that mentally ill people are increasingly being processed through the criminal justice system.

Another reason that mentally ill people are being processed through the criminal justice system at a higher rate is because of their proximity to crime and criminal associates due to living on the streets. The homeless mentally ill associate with other homeless people who often have criminal backgrounds. Many of these people come from other marginalized groups which are characterized by substance abuse, unemployment, lack of education and low income, which are all risk factors for criminal behaviour. The difficulties surrounding a persons mental illness (low educational attainment, unemployment, homelessness) therefore puts them in closer proximity to crime, and it is not necessarily the illness that is the cause of the criminal activity (Draine et al., 2002).

Whether the increase of the number of mentally ill offenders is due to deinstitutionalization, "net-widening" or proximity to crime, the fact is, there is an increase of mentally ill offenders in the correctional system and it is still no consensus if a correctional facility is the most appropriate place

for them. It is important for all offenders to receive appropriate treatment, but if the relationship between an offender's mental illness and their criminal behaviour is never addressed, they will be more likely to continue to reoffend. We will now discuss the relationship between mental illness and criminality.

## **2.3 Relationship Between Mental Illness and Criminality**

### **2.3.1 Criminality and Mentally Ill Offenders**

The mission statement of Correctional Service Canada, which is similar to many correctional service departments in Canada and the U.S. is to "...contribute to public safety by actively encouraging and assist offenders to become law-abiding citizens..." (CSC, 2010). The treatment of many mentally ill offenders unfortunately is in sharp contrast to this mission statement. When the main contributing factor to a mentally ill offender's contact with the criminal justice system is their mental illness, and it is not actively understood or treated within the correctional facility then the system has failed its mission statement.

As the number of mentally ill people in correctional facilities has increased, the question is being asked as to whether mentally ill people are actually more violent, or even more criminal than the general population. How exactly do we explain the relationship between mental illness and criminality? When taking into account several criminogenic risk factors such as age, gender, socioeconomic status, arrest history, substance use during commission of crime, the association between mental illness and the likelihood of committing a crime almost disappears (Hiday, 1995; Swanson, 1994; Muntaner et al; 1998; Angermeyer et al., 1998; Bonta et al., 1998; Draine et al., 2002; Monahan & Steadman, 1983). In many cases it is not the diagnosis of mental illness that is associated with criminality, but the symptoms of psychosis at the specific time of the crime, which are associated with criminality (Link et al., 1992; Muntaner et al., 1998). As previously discussed, for

mentally ill homeless people, criminality is often related to their close proximity to crime. The likelihood of coming into contact with the police increases due to their high visibility in combination with minor nuisance crime activities such as loitering and begging (Corrado et al., 2000). It is not that mental illness increases the likelihood of committing a crime, but the criminal justice system becomes the default service provider for individuals with minor mental disorders (Steadman et al., 1999; Corrado et al., 2000; Teplin, 1985). Teplin (1985) found that police are being used more often as “street corner psychiatrists”, and that mentally disordered offenders are not always more likely to be criminal, but that possibly mentally ill persons may just be more likely to be arrested.

The risk factors that are known to increase involvement in criminal behaviour are unfortunately attributes which characterize many mentally ill individuals, such as low socioeconomic status, lack of education, antisocial peers, and substance dependency. One risk factor which is particularly important to recognize is substance abuse. Substance abuse is a significant risk factor for the prediction of criminal activity, and therefore the evidence of high co-morbidity between mental illness and substance abuse is important to address.

### **2.3.2 Substance Abuse and Mental Illness**

Criminality among the mentally ill can often be attributed to substance abuse. This is especially true for violent criminal behaviour. Swanson (1994) found that most mentally ill people are not violent, even though the rates of violence among mentally ill persons are sometimes found to be higher than among non-mentally ill persons.

This could be due to the co-morbidity between mental illness and substance abuse; those who abuse substances are at much greater risk for violence than if they are just being mentally ill. When mental illness and substance abuse are combined, the risk of behaving violently and being arrested for any type of crime increases (Hiday, 1995). A study done by Swartz (1998) found that the abuse of alcohol by a mentally ill person increased their risk of violence by almost 16 percent, and the use of

drugs increased the risk of violence by almost 29 percent. Hiday (1995) argues that mental illness does not always lead to crime and violence, but that when social factors intervene, such as drug abuse, poverty, and social disorganization the likelihood of arrest increases. Muntaner and colleagues (1998) hypothesized that being diagnosed with substance induced psychosis would be a much better predictor of being arrested than any other psychological diagnosis. It was concluded in their study that patients with substance induced psychosis were actually four to five times more likely to be arrested than those who were schizophrenic, but did not abuse substances.

What is the rate of substance abuse among mentally ill offenders? Several studies of mentally ill offenders report high rates of substance abuse. Studies in both Canada and the U.S have found rates of substance abuse before incarceration that were from 50 to 90 percent among mentally ill offenders (Steadman et al., 2000; Argenou et al., 1995; Munetz et al., 2001; Widom, 1997; Swartz et al., 1998; Arboleda- Florez et al., 1998).

When looking at gender differences in the relationship between mental illness, substance abuse and crime, female offenders are more likely to be involved in crime if they are drug users (Bloom, Owen & Covington, 2003). There is also reported evidence of a strong link between drug use and mental illness among female offenders (Bloom, Owen & Covington, 2003). While substance abuse is an important factor to explore, we will next look at gender differences in criminality, as well as the differences between men and women with regards to mental illness and criminality.

### **2.3.3 Gender, Mental Illness and Criminality**

The different life experiences of men and women contribute to criminal offending. For women, a common reason for criminality is the need for economic, maternal and emotional survival, which stems from abuse, poverty, substance abuse and mental illness (Steffensmeier & Allan, 1995). Drug use may be a means to cope with the emotional suffering caused by abuse and prostitution and



property crime can be used as a way to survive on the streets when legal means are no longer sufficient.

Many women's criminality stems from basic needs for food, shelter and security, and not because they are committing violent criminal acts or have a greater tendency towards criminal behaviour. Compared to men, women are more likely to be involved in petty property crimes and also do not seem to have as strong a commitment to criminal behaviour (Denno, 1994). In the United States, though the number of incarcerated women has increased, the proportion of females incarcerated for violent crimes has actually decreased (Covington, Bloom & Owen, 2003). Women participate in much less violent crime and the criminal careers of violent females begin and peak much earlier (Denno, 1994; Kruttschnitt, 1994; Weiner, 1989). Females are also less likely to repeat violent offences (Denno, 1994; Kruttschnitt, 1994; Weiner, 1989). In 1998, approximately 60 percent of women in the U.S. were serving time for non-violent offences and 36 percent for drug related offences (Covington, Bloom & Owen, 2003).

The recent increase in the number of incarcerated men and especially women in prisons in Canada and the United States is partially due to drug related offences. In the case of women offenders, some reports state that as many as 37 percent of the prison population in the United States is made up of women charged with drug possession. (Chesney-Lind, 1989). As stated above, women are also more likely to use a substance during criminal activity, (40% females vs. 32% of males) as well as to use much "harder" drugs, such as crack cocaine and heroin.

Canadian studies have also found high rates of drug use among incarcerated females (Nicholls et al., 2004; Sacks, 2004). Nicholls et al (2004) conducted a study with 97 women admitted to Burnaby Correctional Center for women in 1999, using the Jail Screening Assessment tool (JSAT), they found a high rate of drug use among the incarcerated females. Over 60% of the women in this study had used marijuana or heroin in the past, where over 75% had used cocaine at some point. At

the time of admission, half were currently users of alcohol or drugs; 52.6% used alcohol, 58.8% used cocaine, 43% used heroin, 40% were intravenous drug users and 30% were experiencing withdrawal (Nicholls et al., 2004).

Also true for male and female offenders is that substance abuse and criminality is linked to emotional problems and poor physical and mental health (Sacks, 2004). Another Canadian study not only found that there was a high rate of substance abuse among incarcerated women, but that the women who had used mental health services prior to incarceration were much more likely to also be drug abusers. When comparing men and women, female offenders who were also drug users had much more recognizable and distinctly different mental health issues than that of men (Sacks, 2004). The difference between men and women's mental health and how this relates to criminality will now be discussed.

#### **2.3.4 Mental Illness among Male and Female Offenders**

Men and women differ in terms of their development and diagnosis of mental illness. As was stated earlier, male and females not only experience mental illness differently, but women are much more likely to suffer from mental illness when admitted to prison (Sacks, 2004; Bloom, Owen & Covington, 2003; Nicholls et al., 2004; Harrison Ross & Lawrence, 1998).

Within the general population male and females have similar rates when it comes to psychiatric diagnosis (Diamond et al., 2001). While there is a misconception that women are more likely to have a mental illness than a man, the reality is that men and women experience mental illness *differently*. Women are more likely to be diagnosed with depression and anxiety disorders, men are more likely to be diagnosed with addictive personality disorders (Stewart et al., 2004; Rhodes et al., 2002).

In the United States, female offenders have been found to be especially more likely than the general population to be suffering from a mental disorder, with 59% reporting to be suffering from at

least one disorder. Compared to males, females entering United States prisons are 17.6% more likely to be recipients of mental health services (Sacks, 2004). One in four women in United States prisons are reported to be receiving a medication for treatment of a psychological disorder (Bloom, Owen & Covington, 2003). In an American national sample, 7% of female offenders had a serious mental disorder, 11% an anxiety disorder, 8% dysthymia, and 45% were reported to be diagnosed with an antisocial personality disorder (Sacks, 2004). In Canada, the situation is quite similar to that of the United States; Canadian female offenders also reported higher rates of serious mental illness than males (Nicholls et al., 2004; Harrison Ross & Lawrence, 1998)

In Canada, the issue of mental illness among women in prison has gotten considerable media attention as well as attention from political decision makers. According to a recent report by the Canadian federal correctional investigator, female offenders when admitted to prison are twice as likely to be diagnosed with a mental-health issue and from 1997 to 2009 the number of women admitted to Canadian penitentiaries with mental health issues has actually doubled (Globe and Mail, 2011). Unfortunately, Canadian correctional facilities do not necessarily have the resources to deal with the increase of mentally ill female offenders. While there are correctional facilities that cater to male mentally ill offenders, which focus on therapy-first – there is currently nothing like this for women. Instead, women in prison who are in need of psychiatric care for serious mental health problems are kept in isolation or sometimes restrained because placing them within the in-prison psychiatric units is deemed too dangerous (Globe and Mail, 2011).

With estimates of mental health issues among women in prison anywhere from 50 to 100 percent, it is not only important to properly treat their mental illness, but also understand why so many female offenders are mentally ill. Nicole Loreto, from the Royal Ottawa Health Group states that a staggering majority of women offenders have suffered from sexual or physical abuse and she believes that this trauma is a significant risk factor for the development of mental health issues,

especially depression and in some instances schizophrenia (Globe and Mail, 2011). The significance of trauma and how this contributes to the development of mental health issues will now be discussed.

## **2.4 Abuse, Trauma and Mental Illness**

As stated above, there has been a recent increase in the number of offenders with mental illness in correctional facilities. We previously discussed the possible reasons for this increase, such as “net-widening” and the police being used as “street-corner psychiatrists”, but what had not been discussed is why so many offenders are mentally ill in the first place? Because of the extremely high numbers of abuse and trauma among male and female offenders, we believe that it is important to address the link between abuse/trauma and mental illness.

Among male and female offenders, as many as 80 percent have reported experiencing childhood physical or sexual abuse (Peugh & Belenko, 1999; Bloom and Owen, 2003). The National Co-morbidity survey found that the lifetime prevalence of mental illness among those in the general population who had experienced childhood sexual abuse was 40 percent compared to only 20 percent for those who had not experienced abuse (Molnar et al., 2001). This and other studies support a well documented link between childhood abuse/trauma and adult mental illness (Anda et al., 2002; Mulder et al., 1998; Santa & Gallop, 1998; Kendler et al., 2000; Caron et al., 1998; Molnar, Buka & Kessler, 2001; Horowitz et al., 2001; Mullen et al., 1996; Baynard & Siegel, 2001; Boudewyn & Liem, 1995; Spataro et al., 2004).

One explanation for the link between sexual abuse and mental illness is that sexual abuse, along with the other adverse conditions in abused children’s lives leads to interpersonal and emotional challenges, possibly damaging their sense of self. This personal damage may make people more prone to psychological difficulties, as well as destructive behaviour (Molnar, 2001; Mullen, 1996).

Dissociative symptoms in adulthood are thought to be one way in which the trauma experienced in childhood manifests as mental illness. The term dissociation is defined as the disruption in usually integrated functions of conscious memory, identity and perception of the environment (American Psychiatric Association, 1994). In a sample of survivors of childhood physical and sexual abuse, sexual abuse especially is thought to possibly have a direct causal link to adult dissociative symptoms (Mulder, 1998). The U.S. National Co-morbidity Survey further linked childhood sexual abuse to mental health issues such as, depression, general anxiety disorders, phobias and post traumatic stress disorder, as well as substance abuse. Of the men and women reporting lifetime sexual abuse, 78 percent of women and 82 percent of men met criteria for at least one mental disorder (Molnar, 2001). Even when taking into account other adverse life conditions occurring at the time of abuse, it has been found that sexual abuse is still a significant predictor of adult mental illness.

Exploring the connection between abuse and mental illness is important when considering the staggering number of offenders who have experienced abuse and trauma in childhood and knowing the prevalence of mental illness in prison. Exploring this connection may also help us better understand the connection between mental illness and criminality, does abuse play a significant role in the development of mental health issues as well as contribute to criminal offending?

To understand how abuse, mental illness and crime are related it is helpful to understand the social context in which the abuse occurs. Men and women offenders who have been abused are more likely to come from a low socioeconomic status, parental substance abuse, family psychopathology, and general family dysfunction (Molnar et al., 2001). Subsequent adult mental health can then be attributed in part to the multiple disadvantages experienced by many abused children. The social context in which abuse occurs can then help us relate abuse, mental illness and criminality. Low socioeconomic status, parental substance abuse and family dysfunction are not just significant to experiencing abusive behaviour, but are also significantly predict involvement in crime.

Before further discussing how abuse and mental illness relate to criminality, we will now look at how men and women differ in regards to their experience of abuse and trauma and how this affects the potential development of mental illness.

## **2.5 Gender, Abuse, Trauma and Mental Illness**

Do men and women experience childhood abuse differently? In general, Men and women who have been sexually abused in childhood differ little in the nature of their abuse experience, and both have a significantly greater risk of coming into contact with mental health services than the general population (Spataro et al., 2004; Spatz Widom & White, 1997; Peugh & Belenjo, 1999). But, their response to this abuse is thought to be quite different (Spataro et al., 2004). One difference between males' and females' response to sexual abuse is similar to the difference found between male and female mental health diagnoses. While women tend to respond to stress through depression, anxiety and psychological symptoms, men tend to manifest their responses more externally, possibly through violence (Spatz Widom & White, 1997).

Abuse is also thought to impact women more negatively than it does men (Peugh & Belenko, 1999; Spatz Widom & White, 1997) due to the fact that women tend to be more vulnerable to stressors. This is identified by not only the manifestation of mental health issues, but the tendency for female sufferers of childhood abuse to also be substance abusers. Some studies have found that females who have been abused are more likely than males to have substance dependency issues (Horowitz et al., 2001; Mullen et al., 1996; Spatz Widom & White, 1997; Chesney-Lind & Bloom, 2000). Abuse of alcohol or drugs can be a coping mechanism and provide an escape from the trauma caused by abuse and also the subsequent mental health issues. The emotional dysfunction that is caused by childhood abuse, in addition to substance abuse behaviour contributes to additional mental health or emotional difficulties (Lowenkamp et al., 2001).

McCormack (1986) agrees that abuse is more likely to impact women more negatively than men, and identifies a connection between abuse and eventual criminal behaviour. He finds that girls are more likely to run away from home as a result of not being able to deal with the trauma of their abuse, and that by running away from home they were much more likely to participate in criminal activities such as substance abuse, theft and prostitution.

What happens if the negative effects of abuse on women, and even men, are not addressed? Similarly, what are the implications of not recognizing and effectively treating the connection between mental illness and coming into contact with the criminal justice system? If offender mental illness and all the factors that contribute to offender mental illness are not addressed additional problems may arise. Offenders with mental health problems may continue to come into contact with the criminal justice system because the reasons for their offending have not been dealt with. The problem of offender re-contact will further be explored as we next talk about mental illness and offender recidivism.

## **2.6 Mental Illness and Recidivism**

Recidivism among the mentally ill can be defined as an arrest or return to hospital for criminal behaviour. If there is a relationship between mental illness and the likelihood of being arrested, we may expect that there is a relationship between mental illness and multiple arrests. Mentally ill persons have been reported to have substantial criminal histories and sometimes violent ones (Gagliardi et al., 2004). Other studies show that when mentally ill persons do recidivate the new offence is often a minor crime, such as property, probation or parole violations or drug a related crime (Steadman et al., 1999).

Regardless of the type of crime, it has been demonstrated that mentally ill offenders do have recidivism rates that are higher than non-mentally ill offenders (Feder, 1991; Silver, Cohen & Spodak, 1989; Jacoby & Kozie Peak, 1997; Wilson, Tien & Eaves, 1995; Hartwell, 2003).

In Canada, almost 50 percent of not criminally responsible (NCR)<sup>1</sup> patients have had prior contact with the criminal justice system, usually for minor offences (Luetgen et al., 1998).

A mentally ill offender recidivism study conducted in the United States by Ventura et al. (1998:1333) found that out of 266 mentally ill male offenders, almost three quarters of the sample were rearrested. Of those 188 who did recidivate, over half of the men were re-arrested for non-violent felonies or misdemeanors (less serious crimes). Almost half of the recidivating offenders re-offended quickly, within six months of release, and offenders who were young and unemployed were most likely to re-offend. Offenders who were diagnosed with affective or personality disorders were the least likely to commit violent offences. Teplin et al. (1994:340), followed psychotic male offenders, including those diagnosed with schizophrenia, alcohol or drug use disorders or experiences of hallucinations and delusions, from the United States for six years and concluded that while the sample was highly recidivistic, having a psychiatric disorder did not increase the risk for committing violent crimes after release from prison. A Canadian mentally ill offender recidivism study found very similar results for general recidivism; the study reported a sample recidivism rate for any type of arrest of 80% (Bonta, Hanson & Law, 1998). The results were also similar when looking at violent recidivism of mentally ill offenders, a slight negative relationship was found between psychosis and re-arrest for a violent offence.

When reasons for why the mentally ill recidivate are explored, common risk factors for re-contact are found. Among the mentally ill, recidivism risk increases with a more extensive prior criminal history, as well as other predictors of general criminal behaviour such as age, antisocial peers and substance abuse (Bonta, Law & Hanson, 1998; Ventura et al., 1998). These risk factors are the

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<sup>1</sup> No person is criminally responsible for an act committed or an omission made while suffering from a mental disorder that rendered the person incapable of appreciating the nature and quality of the act or omission or of knowing that it was wrong (Criminal Code of Canada, 1985, c. C-46, s.16)



same for non-mentally ill offenders, and therefore predictors of general recidivism for non-mentally disordered offenders could also explain recidivism of mentally disordered offenders. For many studies, when age, gender, socioeconomic status, arrest history, and substance use during the commission of crime are controlled, the effects of mental illness on crime almost disappears, (Hiday, 1995; Swanson, 1994; Mutaner et al; 1998; Angermeyer et al., 1998; Bonta et al., 1998; Draine et al., 2002; Steadman & Monahan, 1983).

Bonta, Law and Hanson (1998), found similar results related to risk factors. They also analyzed recidivism rates of a sample of mentally ill offenders using predictors of general recidivism. They found that an offender's age, being male and being single were all significant predictors, as were poor living conditions and family dysfunction. Substance abuse, especially drug use was a significant predictor of mentally ill offender recidivism, as well as history of psychiatric admission. It was concluded that for both violent and non-violent criminal recidivism, risk predictors for mentally disordered offenders were the same for non-mentally disordered offenders.

Low socioeconomic status, family dysfunction and substance abuse are not only predictors of recidivism for mentally ill and non mentally ill offenders. But, as mentioned above, they are also related to the social context in which abuse occurs. These factors all play a part in shaping the offenders life, and potentially may be the cause of a person committing a criminal offence in the first place. In order to effectively rehabilitate an offender, it is important to understand the underlying causes of their criminal behaviour. If mental illness is the underlying issue related to criminal behaviour, and abuse is the root cause of the mental illness then it is important to address and treat both the cause of the mental illness, as well as the illness itself.

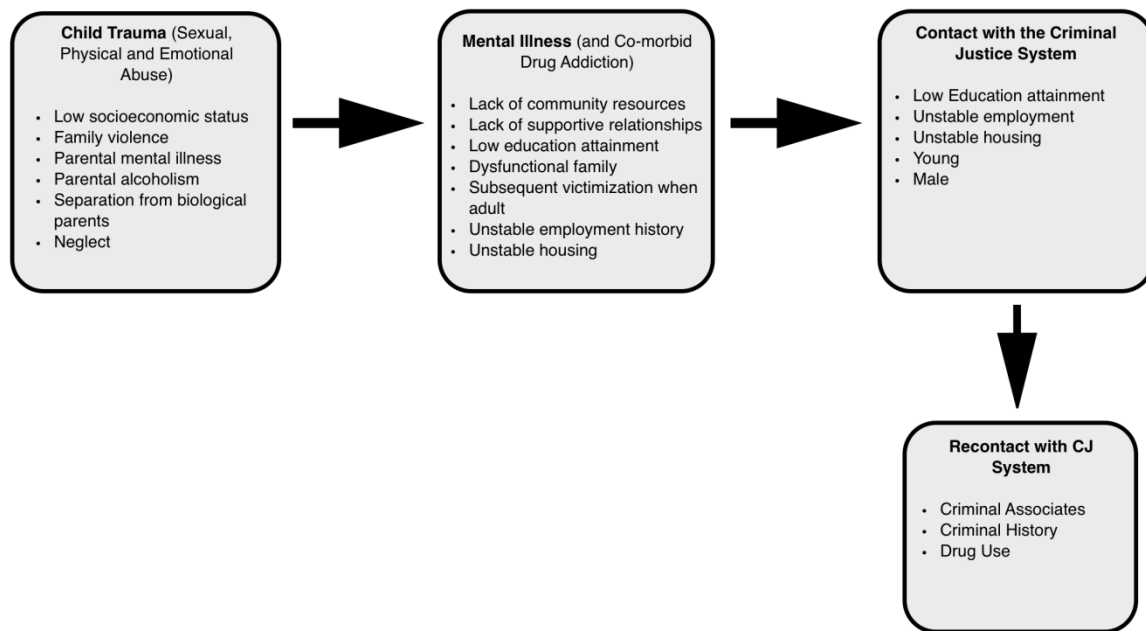
To better understand how abuse and mental illness relates to criminal behaviour, a pathway that from abuse in childhood to mental illness and then eventual contact with the criminal justice

system will be presented. Using the literature that has been discussed, we will discuss how this pathway differs based on gender.

### 2.6.1 Proposing a Pathway from Abuse to Criminal Involvement

Using the literature presented above, the model below shows the potential pathways from childhood abuse, which leads to mental health problems and substance abuse, which then may lead to not only contact with the criminal justice system, but also to repeated contact. How this pathway may differ for men and women will also be discussed.

**Figure 1**  
Pathway from Abuse to Criminal Involvement



This model includes some of the risk factors from childhood abuse. Those who experience abuse in childhood are more likely to come from families who are living in poverty and in areas of social disorganization. This lifestyle is more predisposed to occurrences of family violence, parent

alcoholism, broken and dysfunctional families and child neglect. All of these competing factors contribute to incidences of abuse. As mentioned previously, the experience of childhood abuse is reported to cause impaired psychological functioning such as, dissociative symptoms, depression and emotional issues, especially if the person lacks social and emotional support into adolescence and adult life. Impaired psychological function is also more likely to cause the breakdown of supportive relationships, and interfere in educational and sufficient vocational attainment. People who have been abused as children are also as more likely to experience subsequent violence throughout their lifetime, such as sexual assault or marital violence.

As noted in the previous section, many of the same factors that predict criminal recidivism are also those that predict childhood abuse. That being said, Andrews and Bonta (1994) found that childhood abuse and childhood adversities experienced along with violence can be considered precursors to the involvement with crime in later life. The experiences of poverty and violence that may contribute to the experience of being victimized, as well as lacking crucial supportive community or emotional relationship may not only lead to mental illness, but may also contribute to the chance of involvement with drugs and possible drug dependency. After initial contact with the criminal justice system, those who are affected by mental illness and possible co-morbid substance abuse and receive no mediating assistance, are more likely to have repeated contacts with the criminal justice system.

There is literature which supports the pathways proposed above. This literature uses the life course perspective in order to link together the events and experiences which help to create the path that is taken from childhood to adulthood (Horowitz, 2001; Baynard & Siegel, 2001). It is not believed that there is a simple causal path that would explain the path from childhood abuse to crime; but rather that the path is contingent on a multiplicity of factors that one experiences along the way. It is suggested that additional traumas experienced in childhood, such as witnessing violence, neglect

or trauma experienced as an adult such as domestic violence, in addition to factors such as: strength of social relationships, educational attainment, employment history and family functionality are all contributing aspects that would contribute to the possible development of mental illness (Horowitz, 2001; Baynard & Siegel, 2001). If an individual who has been abused in childhood does experience mental health problems, then whether or not mental illness would potentially lead to criminality would further depend on factors such as socioeconomic status, social or community mental health supports and occurrence of drug or alcohol addiction.

Further literature on violence and the life course states that depending on certain mediating factors in a victimized individual's life, the experience of violence may have profound effects on psychological functioning, as well as make the victimized individual more likely to be involved in a violent and criminal subculture in later life (Macmillan, 2001; Bagley et al., 1997; Widom, 1989; Lewis, 1992). MacMillan (2001:11) states that "violence is a salient and powerful life experience that shapes developmental pathways and influences the character and content of later life."

Widom (1989) and Lewis (1992) use the "Cycle of Violence" hypothesis to propose that victims of child abuse will have a greater chance for involvement with crime later in life. This hypothesis is supported by the high numbers of adolescents in correctional and mental health facilities that have experienced physical or sexual abuse (MacMillan, 2001). A study done on Toronto street kids by Hagan and McCarthy (1997) demonstrated that being abused as a child was not only a major reason that street kids run away in the first place, but child abuse was an important precursor to the street kids involvement in crime, especially prostitution and drug use.

Hiday (1995, pp.7) models the relationship between mental illness and committing violence. His model attempts to demonstrate that coming from a life of social disorganization and poverty puts an individual in a position to be more likely to experience victimization, participate in substance use, experience mental illness, experience stress which may lead to loss of employment, all of which may

ultimately lead to acting out criminally or violently. This is further backed by Mirowsky and Ross (1983), who state that being victimized, or being part of a violent atmosphere may lead to a general lack of trust. Being victimized, often by a family member, and the experience of betrayal and powerlessness may lead to a belief system characterised by fear and mistrust. The interaction of such a belief system and symptoms of psychosis may lead to a constant feeling of threat or fear of surroundings, which contributes to the chance of a person suffering from mental illness being violent (Mirowsky & Ross, 1983).

The hypothesized model above proposes the pathways that may occur when all factors considered are playing their part, it does not however explain the gender differences in the experience from child abuse to criminal justice contact. Some factors, such as socioeconomic status, family dysfunction and parental alcoholism are most likely to occur similarly for both males and females, but how males and females cope with their experience of abuse and therefore the effects that the abuse may have on the experience of mental illness are thought to be quite different.

### **2.6.2 Proposed Pathway and Gender Differences**

As mentioned above, one major difference between men and women at the beginning of this pathway is the experience of childhood sexual abuse. Abuse in childhood and as an adult is said to impact women more negatively than it does men. (Macmillan, 2001; Peugh & Belenko, 1999; Spatz Widom & White, 1997; McCormack, 1986). Females who were sexually abused also reported a greater number of psychological disorders and substance abuse disorders than males (Molnar et al., 2001; Horowitz et al., 2001).

So how might a pathway that leads from child abuse to contact with the criminal justice system differ for males and females? First it is important to look at why women commit crime, or what types of crime they commit. For women, a common reason for criminality is for the need for food and shelter, taking care of her children and emotional dysfunction, which stems from abuse,

poverty, substance abuse and mental illness (Steffensmeierer & Allan,1995). Women are also less likely to commit less violent crime. This may suggest that for most women, crime, as stated above, is a result of the need to survive. Women are more likely to engage in property crime, prostitution and drug related crimes as means for their own, as well as their children's survival (Steffensmeierer & Allan,1995).

Substance abuse is also a factor that contributes to female criminality. Both male and female offenders are likely to be under the influence of a substance at the time of their arrest, but for women who have been abused, their substance abuse could be a result of the severe emotional distress caused by their abuse. This distress may lead to alcohol and drug dependency, which occur more often among female survivors of abuse than male survivors (Horowitz et al., 2001). This drug dependency could then lead to an increase in contact with the criminal justice system.

Finally, another reason that abuse may lead to criminal behaviour more often for women, is that victimization experience as a child may actually hinder successful transitions to adulthood. Childhood victimization is thought to affect an individual's belief system, employment success, and supportive relationships and by promoting a lifestyle of crime and deviance (Menard, 1995). For females, more than males, this may often be the case as the factors that contribute to the experience of abuse are interconnected with the factors which increase the chances of psychological distress. Psychological dysfunction is then thought to possibly be interconnected with an increased risk for crime and deviance.

These factors all suggest how victimization early on in life may contribute to female criminality. Convington (1991:85) believes that abuse, addiction and poverty are the factors which contribute to female criminality. Chesney-Lind and Rodriquez (1983) support this connection. In a study of American female offenders, 60 percent had been sexually abused or raped as young women and ran away in response to their victimization. The crimes associated with these abused women

included prostitution, petty crimes and drug related crimes in order to survive. The lack of education or occupational skills necessary for these female offenders to remove themselves from their present situation was a major contributing factor for their repeated contact with the criminal justice system (Chesney-Lind, 1989).

If females experience childhood victimization more often than males, and also respond in a more negative way to this victimization, women, when considering all the mediating factors, may be more likely to suffer from a mental illness and drug addiction due to their victimization experience. Because of their mental illness and substance abuse, they may be put in closer proximity to a subculture of crime and deviance.

## **2.7 Conclusion**

Not only does the literature presented have potential for changing policies regarding the incarceration and treatment of mentally ill female offenders, but the association between abuse, mental illness and criminality, which is also thought to be relevant among male offenders, makes the potential for policy changes important among mentally ill offenders in general. Only with further investigation of the association between the context of mental illness and criminality can the importance for change be recognized. The literature discussed above presented the idea that those suffering from a mental illness may not be more likely to be criminal, but that their mental illness and the lack of support received for their mental illness and possible drug and or alcohol dependency may lead to increased and repeated contact with the criminal justice system. The context of offender mental illness is then important to investigate, as childhood adversities may be recognized as the starting point of not only mental illness, but also associated with later criminal involvement. A high number of offenders experience childhood physical or sexual abuse, and therefore it is possible that it is the context in which the offender's mental illness arose that should really be addressed, and not necessarily only their psychological symptoms and criminal behaviour.

For further investigation of the research problem and the literature discussed, two separate sets of data on Ontario provincial male and female offenders will be analyzed. Specific research questions will be addressed using the analysis technique of logistic regression in order to further understand the connection between the context of mental illness and criminal justice involvement. The first questions to be asked are (1) what factors predict recidivism?, and (2) do men and women differ in terms of these predictors? In particular, we are interested in whether mental illness has a different effect on recidivism for men and women and whether abuse explains some of the differences in the effects of mental illness on recidivism among men and women. These research questions, along with the data and methods that are to be used in order to answer the research questions will be presented in the following chapter.



## **Chapter 3**

### **Methods and Data**

#### **3.1 Introduction**

As presented in the previous chapter, the research questions are aimed at discovering whether male and female offenders differ in terms of their mental health needs and, in turn, how these differences may affect their probability of recidivism. Critically, this research will also investigate the potential effects of past abuse of various kinds on recidivism, acting as it may through mental health. These research questions are important for several reasons. The mandate of the Ontario Ministry of Community Safety and Correctional Services (2011) is to provide “programs and facilities designed to assist in offender rehabilitation”. Clearly the spirit of this mandate would require that these programs be as effective and appropriate as possible. Similarly, and like many other provincial as well as U.S. state correctional departments, the mission is for rehabilitation and community reintegration. The mandate of the Pennsylvania Department of Corrections (2011) is “...to provide opportunities for inmates to acquire skills and values necessary to become productive law-abiding citizens...” The Alberta Solicitor General and Public Security (2011) states that Alberta correctional services seek to “assist and encourage inmates and young offenders to use the services and programs related to their needs for the purpose of developing the abilities and skills necessary to conduct independent, law abiding lives”. While effective programming and rehabilitation is the goal, this may not always be possible for all inmates. As described in Chapter 2, the services provided for female offenders may not be adequate, as they are usually designed around the needs of male offenders. As well, and as the literature we have presented above shows, mental illness and childhood abuse are possible factors that lead to offending, and these are factors that may be more prevalent for women. The literature suggests that these factors are not necessarily properly addressed in offender treatment, even if treatment is provided. Because programs provided are not always successful in deterring a

criminal lifestyle, further research into the factors contributing to offending behaviour needs to be conducted in order for correctional programs and facilities to fulfill their mandate; provide programs that assist in offender rehabilitation.

This project will use individual-level data on a sample of offenders in Ontario to examine the effects of gender, mental health status, and previous abuse experiences in the probability of recidivism. The main source of data is a series of mental health assessments of male and female offenders, conducted from May 2005 to June 2007 by the Institute of Applied Social Research at Nipissing University in conjunction with the Ontario Ministry of Community Safety and Correctional Service. The *Mentally Disordered Offender* project is the only source of Canadian data that can be used to model recidivism on the basis of mental health characteristics, and includes several well-validated measures of mental health as well as information about previous victimization. We will also use data from the Ontario registry system for offenders, the Ontario Offender Tracking Information System (OTIS) to increase our confidence in the generalizability of those data by looking at the variables at a univariate level, as well as at a bivariate level, by assessing the relationship between re-contact and mental illness, gender and abuse.

This chapter presents the data and methods used in order to answer the research questions proposed above. We begin with a discussion of the general approach, and follow with a description of the data used for analysis, the modeling strategy, and the particular variables used to model recidivism. The chapter concludes with limitations that the data presented during analysis.

### **3.2 General Approach**

Our general approach is to model “recidivism” on the basis of sets of important predictor variables, in order to identify the important relationships between gender, mental health, previous victimization, and re-contact. The Ontario Ministry of Community Safety and Correctional Services defines “recidivism” as “a return to correctional supervision following conviction for a criminal

offence committed either during or after correctional supervision” (Brown, 2010). However, for the purpose of this thesis, recidivism will be more appropriately defined as ”re-contact” with the criminal justice system, as the definition of recidivism is quite restrictive. Poporino & Motiuk (1995) found that offenders with a mental illness were more likely to violate the conditions of their conditional release, while offenders without a mental illness were more likely to be returned to custody for committing a new criminal offence. In a broader definition of criminal recidivism, any form of contact with the police after release from a correctional facility that returned the offender to custody is included as “re-contact”. Each case was looked at individually to see if the offender had recidivated or re-contacted, meaning that not only were cases included if the offender had been given a new sentence for a new and separate crime, but any violation of terms that coincided with the original sentence which brought the offender back into custody was included and counted as re-contact.

Re-contact will be modeled using various predictors. Based on their theoretical significance, several predictor variables which have been identified in the literature as highly related to recidivism will be used as controls in the initial models. The predictor variables of mental illness, gender and experience of abuse were shown in the literature presented above to have a strong connection to female criminal offending as well as repeat contacts with the criminal justice system. By developing models that test the strength of these variables in relation to re-contact, the importance of these connections will hopefully be demonstrated. Logistic regression is the best approach because it is able to show how well each progressive model predicts re-contact as the variables are added individually, as well as, in interactions.

The population of study, data collection and the datasets are discussed below.

### **3.3 Data**

The population of interest includes all adult inmates of Ontario Ministry of Community Safety and Correctional Services facilities in 2005, following their re-contacts until 2008. The samples used

to test these prediction models are representative of Ontario male and female adult inmates sentenced and remanded from 2005 to 2007. Two different samples of Ontario adult inmates will be used. The first, known as the Mentally Disordered Offender (MDO) project data, collected by conducting face-to-face mental health assessments using the RAI-MH assessment tool with Ontario inmates from May 2005 to June 2007, in order to identify the mental health status and needs of these adult offenders (Brown, 2010). This will be the main source of data for analysis, but, as it is a non-random sample with relatively few women, we will use additional data from the Ontario Ministry of Community Safety and Correctional Services to examine whether the LSI-OR data are representative, on a number of demographic characteristics, of the total Ontario Inmate population. These Ministry data will increase our confidence in the generalizability of our findings from the MDO data to the general population of offenders.

The datasets will be discussed below, as well as the specific data collection methods and the description of the assessment tools used to collect the data.

### **3.3.1 Mentally Disordered Offender Project**

The Mentally Disorder Offender (MDO) dataset will be used in order to model re-contact using logistic regression to answer the proposed research questions. In May 2005, a study was conducted by the Institute for Applied Social Research (IASR) in order to determine the number of mentally disordered offenders in Ontario jails and correctional centres, and their needs for psychiatric services (Brown, 2010). As part of this project, individual interviews were conducted with inmates, using the Resident Assessment Instrument – Mental Health (RAI-MH). In 2005, the Ministry of Health and Long-Term Care mandated the use of the RAI-MH for use in all hospitals in Ontario with designated psychiatric beds, including all general, provincial and special psychiatric facilities. The RAI-MH was selected for use in the Mentally Disordered Offender study because it maintained a

‘common language’ between assessing the mental health care needs of offenders, and communicating these needs to health care providers.

Based on the training received from the University of Waterloo and the interRAI group, the RAI-MH assessment tool was administered in semi-structured way, by following the format of the tool, but treating the assessment as a conversation. Due to the sensitive nature of certain topics, conducting the interview in a semi-structured manner helped to increase the comfort level of the individual being interviewed. When dealing with sensitive topics, the sequence of the questions could be altered to accommodate the comfort level of the interviewer and the person being interviewed (Hirdes et al., 2005). Besides the interview portion of the assessment, utilizing all sources available to the researcher, doctors, nurses and client files are equally important. In the case of the Mentally Disordered Offender project, correctional officers and nurses were used as an alternate source of information.

### **3.3.2 Measuring Mental Health**

The Ontario Joint Policy and Planning Committee (JPPC) developed the RAI-MH, in collaboration with interRAI (Fries et al., 2009; Hirdes et al. 2002). Originally developed for use in a health care setting with a mental health population and is designed to support care planning, outcome measurement, quality improvement and case mixed funding applications. The target population for the RAI-MH is adults aged 18 and over in in-patient psychiatric settings. Mental health professionals (e.g., nurses, social workers, psychiatrists, psychologists, and family physicians) are trained to collect information from patients, relatives and other care givers using a standardized assessment protocol (Hirdes et al., 2003 Hirdes et al., 2002). This tool assesses the key domains of patient functioning, including, past and present interactions with others, mental and physical health, substance abuse, self-injury, social support, medication compliance, and discharge readiness. The information collected is then scored, and care plans are created based on the signaled need for care planning in a particular

area (Mental Health-Clinical Assessment Protocols) (Hirdes et al., 2003; Seto, Harris and Rice, 2004; Martin et al. 2009).

While this tool is mandated for use in hospital psychiatric settings, it was a useful tool to more accurately capture the prevalence of mental illness in a correctional setting. Currently, Ministry of Community Safety and Correctional Services data are the only information provided for all offenders entering into the provincial correctional system. Unfortunately, the mental health data available for offenders are not necessarily up-to-date. As found in a recent report on the prevalence of mental illness among Ontario offenders, (Brown, 2010), as well as in a similar study of offenders in the state of Michigan (Fries et al., 2009) prison reported estimates of mental illness may be quite low. This is because prisoners often have very little medical information on file, or may have never been assessed for symptoms of a mental disorder. The RAI-MH was used in order to document current signs and symptoms of mental disorder among a prison population.

The RAI-MH is used to identify the presence of symptoms of mental illness and mental health care needs, it does not measure a formal mental health diagnosis. The RAI-MH assessment has Mental Health Assessment Protocols (MHAPs) embedded within the instrument. The MHAPs are valid and reliable measures of mental illness (Martin et al. 2009) These scales measure the presence and severity of mental health symptoms and are derived from statistical algorithms. . The Mental state indicators on the RAI-MH are scored on a four point scale ranging from 0 = ‘symptoms not present’, to 3= ;exhibited daily in the last 3 days’. For the purpose of this research and to indicate the presence of symptoms of moderate to severe mental illness, a mental illness scale was used, which was established in prior research (Brown, 2010; Fries et al. 2009) In the Ontario study, which looked at the prevalence of mental illness within Ontario correctional facilities as well as the mental health care needs of those offenders, five of the mental status symptom scales were used to create a composite scale of mental illness variable in order to estimate the prevalence of mental illness within that sample

(Brown, 2010; Fries, et al., 2009). Based on the Cognitive Performance Scale (CPS), the Depression Rating Scale (DRS), the Negative Symptoms scale (NSS) the Positive Symptom Scale (PSS), and the Mania Scale, a Mental Health Symptom Summary measure was developed. This measure indicates whether a person appears to have a moderate to severe mental illness based on their score on the various mental state indicator scales. In order to validate the performance of the instrument and the Mental Health Symptom summary measure, the Michigan study utilized a psychiatrist member of the research team, who interviewed 19 of the inmates to make an independent clinical determination of psychiatric diagnosis (Fries et al., 2009). The results of this independent evaluation found that 18 of the 19 cases, the psychiatrist and the assessors were in agreement as to whether the inmate had a mental health problem. It should be noted that the assessors in this case were using a variation of the RAI-MH tool, the RAI-Correctional Facilities (RAI-CF). This tool was created to make adjustments for the unique correctional setting, however the items used in order to create the mental health symptom scales remained the same, embedded within the RAI-CF.

The construction of the Mental Health Symptom summary measure will be presented, following a discussion of the methods for analysis. The limitations of the MDO project data will now be discussed.

### **3.3.3 Data Limitations: MDO data**

The first limitation of the MDO data is the small number of women in the sample (n=106). This is due, as noted in the previous chapter to the small number of women who are incarcerated. Secondly, as stated above the RAI-MH was created for use in a hospital setting, therefore the correctional setting creates some problems. Conducting interviews in a correctional setting also poses problems for the validity of some items for data analysis. Fries et al. (2009) conducted a similar study in the state of Michigan with the Michigan Department of Corrections. While the assessments were able to trigger reliable and valuable mental illness data, other variables of interest, such as

addictive behaviour and residential stability were more difficult to gather in a correctional setting. The particular problem with measuring addictive behaviour is the time frame. Offenders were asked if they had used any of the substances within the last few days, last week or more than a year ago. While they may have used a drug or drank alcohol within that time frame, the problem is that drug use; and in jail, alcohol abuse; is a crime and might be unreported. Alternatively, prisoners might claim drug use to enhance their images (Fries et al., 2009). The second issue is that it only captures substance use of more than a year ago, and many offenders could have been incarcerated for a year or more. Therefore the information collected is not necessarily credible. While the RAI-CF does not fully solve for these issues, the changes that were made on the RAI-CF would have been beneficial for assessments. Examples of these changes are the time frames assigned to some items due to the fact that subjects may have been incarcerated for two years or more.

Another limitation of the correctional setting is the restriction being able to select a random sample; offenders had to volunteer in order to ensure the rights of the offenders. As reported in Brown (2010), bias in the MDO data due to non-random sampling, and purposively over sampling of Aboriginal and female inmates created problems for analysis. In order to correct for this sample bias, the statistical technique Propensity Score Weighting (Rosenbaum and Rubin, 1983; 1985; Hirano and Imbens, 2001) was applied to the data (Brown, 2010). This weighting technique will be discussed in more detail.

Finally, the high volume of offenders and sometimes limited staff poses a problem. Acquiring additional offender information from institution staff, such as correctional officers and nurses, was not always possible. While gathering additional information is an important part of the RAI-MH assessments, the correctional officer or forensic nurses did not necessarily know the offender well enough, or their time was too limited to speak with a researcher. If a mental health diagnosis was not recorded in the offender's health file, this information could not be recorded. Because the researchers



did not always have the ability to speak with correctional staff who interacted daily with the offenders, the mental health diagnosis information was not necessarily complete. In order to obtain a picture of moderate to severe mental illness within this sample, the Mental Health Symptom summary measure, from the report to the Ministry of Community Safety and Correctional Services constructed by Brown (2010), and the Michigan study by Fries et al. (2009) will be used.

### **3.3.4 Offender Tracking Information System (OTIS) and Level of Service Inventory (LSI-OR)**

In addition to the MDO data, the OTIS and Level of Service Inventory-Ontario Revision data will be used to further explore the relationship between re-contact and gender, mental illness and abuse. Because of the limitation of the MDO data being non-random, the OTIS data will aid in validating the MDO data by demonstrating that the variables in question are similar on a univariate and bivariate level of analysis. The Offender Tracking Information System (OTIS) is used not only by the Ministry of Community Safety and Correctional Services, but also the Ministry of Children's and Youth Services, Youth Justice Service Division. It is a database containing: institutional admission and discharge, photos of offenders, tracking of movement, tracking of institutional misconduct and sentence calculations. The system also contains community release information including: intake, release, tracking of legal documents and community release conditions, and case management functioning. Another major feature of OTIS is that it contains the LSI-OR risk of offending assessment results for all sentenced offenders (Girard and Wormith, 2004).

The Level of Service Inventory (Ontario Revisions) tool is one of the most popular and well researched offender risk/need instruments to date (Girard & Wormith, 2004). It includes risk and need factors, as indicated in the "What Works" literature, that are identified by theoretical and empirical evidence as predictors of recidivism (Gendreau, Little & Goggin, 1996). The "What Works" literature refers to the work of Paul Gendreau and colleagues, which discusses what really

works when it comes to rehabilitating an adult offender population. Gendreau's et al (1996), Meta-Analysis of the Predictors of Adult Offender Recidivism, looked at 131 studies and identified 1,141 predictors of adult offender recidivism. Based on these predictors, they narrowed down which predictors best predict recidivism. The strongest domains identified were: criminogenic needs, criminal history, antisocial behaviour, social achievement, age, gender, race and family. The general risk and need factors that are included in the LSI-OR assessment tool are grouped into eight specific domains (Girard & Wormith, 2004). The LSI-OR also includes specific risk/need factors, prison experience, risk/need summary and profile, other client issues, and special responsibility considerations.

The original purpose of the tool was to assist probation officers in planning their supervision of probationers and parolees in Ontario. It is now used among male and female sentenced provincial offenders to predict prison infractions and re-incarceration, as well as security classifications, days in segregation, misconducts and early release (Girard & Wormith, 2004). The LSI-OR information is collected using semi-structured interviews and review of official records and case files. The LSI-OR has been used since 1997 in Ontario provincial correctional facilities and its use is a matter of policy for sentenced offenders (Girard & Wormith, 2004).

Using the Ministry provided data presented above<sup>2</sup>, which include 534 male and 550 female sentenced offenders, and based on the literature previously discussed, the variables of particular interest include: age, gender, aboriginal status, mental health issues, previous victimization, and residential stability.

A variable of particular importance from this data will be the total LSI-Score recorded for each offender, which as stated above is the measure of risk to recidivate. The total LSI-OR score will be used as the main control variable in order to account for re-contact, aside from the specific

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<sup>2</sup> Ethics approval was obtained from the University Of Waterloo Office Of Research Ethics, as well as the Ministry of Community Safety and Correctional Services.

variables in question. The question is whether they have a separate and significant impact for predicting re-contact, or does the LSI-OR already account for this impact. Because the LSI-OR/OTIS data do not contain a reliable mental illness variable for these offenders, it is not a possibility to test this. The total LSI-OR Score will therefore be of particular interest for analysis with the MDO data.

The importance of the LSI-OR/OTIS sample will be demonstrated when the control variables, as well as the gender, mental illness and abuse variable derived from this sample, are compared with the same variables of interest within the MDO data. As stated above, these data will help to show that the MDO data, taking into account sampling restraints, are still representative of the population of male and female offenders.

### **3.3.5 Data Limitations: OTIS/LSI-OR Data**

While the data derived from OTIS and the LSI-OR are ideal for beginning the analysis due to the large sample size available, there are still limitations to these data. While all sentenced offenders complete LSI-OR assessments, there are questions surrounding whether the information in OTIS provide the most recent offender information. In particular, the data entered into OTIS are not necessarily updated upon each and every admission. Due to the high volume of offenders cycling in and out of the system, full histories regarding psychiatric admissions and substance abuse are not always current. Offenders who have received LSI-OR assessments may also cycle in and out of correctional facilities, but may only be held on remand. The data on file for this offender could therefore out-of-date and not reflect an offender's current situation (ie. mental health status, living situation, current substance abuse).

Finally, while the LSI-OR assessment tool is a great predictor of recidivism as a whole, Brown and Archambault (2007) found that some predictors of recidivism found in the LSI-OR assessment, when looked at as individual scales, do not necessarily have strong effects. While static factors such as criminal history predict recidivism well, the dynamic factors on their own without the

power of the entire assessment tool they have very little predictive power and as individual scales are quite weak. This limits the ability to use these dynamic factors as individual predictor variables. An example of this is the indicator included within the assessment tool for substance abuse. The assessment tool measures current and previous substance abuse, but on its own is not a predictive measure.

The table below visually presents the sets of data discussed above. The table shows the distribution of inmates by gender, status and offender re-contact for each data source. The ‘Status’ of the offender refers to whether he or she had been sentenced, or were being held on remand within the two year assessment period. A sentenced offender has received a ‘warrant of committal’, meaning they have been given a judgment and are serving their time in a correctional institute. If an offender is ‘remanded’, they are being held and are awaiting a judgment.

Important to note is the large discrepancy between the two sets of data on the gender variable. This is due to the fact that the LSI-OR/OTIS data are a random sample provided by the ministry, stratified by gender, and the MDO data are not.

**Table 1**  
Sample Offender Characteristics (Sentenced versus Remand and Other) by Data Collection Method

	MDO Data ( <i>n</i> = 522)	LSI-OR/OTIS Data ( <i>n</i> = 1084)
<b>Offender Gender</b>		
Male	416 (79.6%)	534 (49.3%)
Female	106 (20.4%)	550 (50.7%)
<b>Re-Contact</b>		
Yes	306 (58.6%)	622 (57.4%)
No	216 (41.4%)	462 (42.6%)
<b>Offender Status</b>		
Remand	166 (31.8%)	527 (48.6%)
Sentenced	339 (64.9%)	64 (8.8%)
Other	17 (3.3%)	31 (2.9%)

### **3.4 Methods**

Logistic regression was chosen as the main method of analysis because of its ability to predict a discrete outcome from a set of variables; in this case the outcomes are recorded as 1 or 0, indicating re-contact or that a re-contact was not observed (Tabachnick & Fidell, 2001). As noted above, recidivism for the purpose of this thesis is defined as all re-contacts with the criminal justice system, and not necessarily incarceration for a separate offence to that which the offender was previously released. Logistic regression is able to predict a discrete outcome as a function of a series of independent variables for each case (Menard, 1995). Taken from the literature, the strongest known predictors of recidivism will be included in the model and used as controls in order to test the true impact that mental illness, gender and abuse have on predicted offender, especially female, re-contact.

#### **3.4.1 Logistic Regression**

Logistic regression is a preferred analysis technique because of the flexibility allowed. Logistic regression shares similar assumptions of normal regression; linearity, multicollinearity and independence of errors (Tabachnick & Fidell, 2001; Field, 2009). In order to produce valid results, predictor variables cannot be too highly correlated or related. Logistic regression also assumes a linear relationship between predictor variables and the outcome (re-contact). Because the outcome variable in logistic regression is a categorical variable, this assumption is automatically violated – therefore, the log of the data is used (Tabachnick & Fidell, 2001; Field, 2009). The data are transformed using a logarithmic transformation in order to express the non-linear relationship in a linear way. The logit equation can be expressed as the probability of a predictor variable occurring within a certain category (re-contact or no re-contact). The value resulting from the equation then varies between 0 and 1 and each predictor is assigned a coefficient (Field, 2009). The coefficients are used in the analysis to define parameters and estimate the best fitting model. The best fitting model is developed by using Maximum-likelihood estimation, which selects the coefficients that make the

observed outcome values most likely to have occurred (Field, 2009). By creating the best fitting model, values for the outcome variable (re-contact) can be best determined from the values of the predictor variables (gender, abuse, mental illness). After testing for assumptions, and through the manipulation of the predictor variables – the likelihood of re-contact with the criminal justice system, based on the predictor variables (with the “best fit”) will help determine which predictor variables (and combination of predictor variables) have the greatest impact on re-contact actually occurring.

### **3.4.2 Goodness of Fit, Classification and ROC Curve Analysis**

When constructing the logistic regression model, there are several methods that can be used to determine how well the data fits the model. Some methods are suggested by the SPSS statistical package, such as the Hosmer-Lemeshow goodness of fit test, and looking at the change in deviance graph based on the models predictive probabilities and studentized residuals. SPSS also produces statistics that tell us how well the model predicts the dependent variable. The classification table is one classification statistic that displays the predictive accuracy of the model and what percentage of cases were classified correctly (Kleinbaum & Klein, 2010). This number can be used to compare the different models and help to decide which model is the best predictor.

Another method, which is actually thought to be a better method of classification is the receiver operating characteristic (ROC) Curve analysis. While the ROC analysis is often used to assess the predictive accuracy of a scale, by using the predicted probabilities produced by the model during logistic regression analysis, the Area Under the Curve (AUC) statistic can be used to further classify the model. The AUC can be interpreted as the probability that a randomly chosen case who has re-contacted and a randomly chosen case who has not re-contacted would be correctly distinguished based on the variables in the model (Kessler et al., 2003; Kleinbaum & Klein, 2010). The asymptotic significance is also produced, which tells us if the model is a significant predictor of

the dependent variable (Kleinbaum & Klein, 2010). These tests will be discussed in more depth with the presentation of the final model.

### **3.5 Data Recoding and Manipulation**

#### **3.5.1 MDO Data**

In total 522 offenders were interviewed for the Mentally Disordered Offender Project.<sup>3</sup> The sample includes 416 male offenders and 106 female offenders from 13 separate Ontario Provincial jails, Correctional Centres and Detention Centres. All offender participants in the study were volunteers who gave their consent after being informed as to the details of that research project. As discussed in the data limitations above, while it would have been ideal to have collected a random sample of offenders, this was not possible due to the setting restrictions of a correctional institution, the sensitive nature of the questions and the due to the fact that the offenders had to be willing participants in order to consent to the interview. To correct for non-random sampling bias, Brown (2010) used the propensity score weighting technique. See below for a discussion of this technique and how it applies to these data.

Included in the MDO dataset are additional OTIS and LSI-OR data for each offender.<sup>4</sup> In July 2007, the 522 male and female offenders interviewed for the Mentally Disordered Offender project were used for the recidivism extension of the original project. Using the Offender Tracking information System (OTIS), each offender was assessed to see if they had had a re-contact with the criminal justice system and had been returned to custody since being released after their initial RAI-MH assessment. The release date for each offender in the sample was compared to the date of their interview, and this date was then used as the reference point to assess whether the offender had

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<sup>3</sup> Offenders interviewed by research assistants from the Institute for Applied Social Research. The project was conducted between May 2005 and August 2007.

<sup>4</sup> Provided by the Ministry of Community Safety and Correctional Services Statistical Effectiveness unit in North Bay, Ontario.

indeed had a re-contact and had returned to a correctional facility, either related to their previous sentence, or for a new charge. A new variable was created in order to indicate whether the offender had indeed experienced a new criminal contact. The dependent variable in the analysis of the MDO data will be 're-contact', which indicates whether an offender had returned to custody.

### **3.5.2 Propensity Score Weighting**

In order to correct for bias of the non-random MDO sample, and as stated above, Brown (2010) used Propensity Score Weighting, as he found it to be “a well-researched and widely accepted statistical approach used to estimate the probability that a case will be selected for inclusion in the treatment group versus a comparison group, based on a set of observed characteristics or covariates” (2010, pp. 69). This technique is used in order to correct for the sample bias in the analysis. The propensity score weight is calculated as the inverse probability of selection into the treatment vs. comparison group and expressed as a standardized score to adjust for sample size. Cases which are over-represented (based on the weight given) due to the non-random sampling are “down-weighted” in terms of the influence in the analysis, while underrepresented cases are given a greater weight in the analysis (Brown, 2010). McNiel and Binder (2007) used this technique to correct for baseline differences between a control and non-random treatment group: individuals entering a San Francisco mental health court compared to those who were eligible for selection into mental health court but were processed elsewhere. Their primary research question was: To what extent does participation in the mental health court reduce the probability of recidivism? (McNiel and Binder, 2007). Due to the observational nature of this study and the fact that individuals were not randomly assigned to the treatment group, they used the technique of propensity score weighting in order to correct for the possibility of misleading results due to non-random sampling. Similar to McNiel and Binder (2007), Brown (2010) used the two step approach recommended by Hirano and Imbens (2001). First, the sample (N=522) who had been interviewed and a random sample (N=1200) obtained from the



Ministry of Community Safety and Correctional Services were combined into one sample (N=1722). Logistic regression was then used to model the probability of being selected into the treatment group as a function of instrumental variables for each individual in the sample. The variables used were age, gender, aboriginal status, region, correctional status, offence severity, mental health alert, substance abuse alert and total LSI score. By using the inverse of the estimated probability of selection, a propensity weight was then given to each individual case.

**Equation 1**

Propensity Score Weighting

$$w_1 = \begin{cases} \frac{1}{p_1}, & \text{if in the mental health court group} \\ \frac{1}{1-p_1}, & \text{if in the treatment as usual group} \end{cases}$$

The weights then accounted for cases with very low or very high estimated probabilities of being a part of the treatment group (the group that was actually interviewed). Imbalances due to over or under estimation were then minimized and a sample was effectively created with cases matched by similar likelihood of being selected into the treatment group (McNiel and Binder, 2007). More details on the propensity weighting procedure are provided in Appendix D.

For the MDO sample, offenders interviewed during the MDO project, N=522 were the treatment group and a random sample drawn from the OTIS database, N=1200 representing inmates incarcerated during the same period as inmates in the mental health assessment sample were the comparison group. When the propensity score weights were applied to the sample, the resulting sample size increased from N=522 to N=977.

Once the weights were applied to the sample, there was concern that the sample size was inflated as it almost doubled. To adjust for this, the researcher scaled the weights by the mean weight

derived from the standard propensity score weighting method. Each case was divided by a mean weight of 1.87. The data were then weighted based on the new weights. This returned the sample back to an N of 522. Because of the fact that only cases with LSI-OR scores were included in the analysis, the final models were estimated with a sample of N=262.

### **3.5.3 Independent Variables: Total LSI-Score**

As discussed above, the Level of Service Inventory-OR tool is one of the most commonly-used and well researched offender risk/need instruments, and is mandated for use within the Ministry of Community Safety and Correctional Services (Girard & Wormith, 2004). Because the LSI-OR is such a well-documented tool for predicting recidivism, it is important to include the total score received as a main control in the model. Unfortunately, in order for an offender to have an LSI-OR assessment score they have to have been sentenced. Of the MDO project sample (N=522), 76% had been currently or previously sentenced and therefore received an LSI-OR assessment. When the weights were applied, a total of 262 cases which had LSI-OR assessments were included in the analysis. In addition to the LSI-OR score, age, aboriginal status were included in the model to assess their contribution to predicting re-contact. Items such as criminal associates, additive behavior and criminal history will not be included as variables as they are items within the LSI-OR assessment and therefore the total LSI-OR total score will be used as one of the main variables controlling for re-contact.

### **3.5.4 Independent Variables: Mental Illness, Gender and Abuse**

There are three predictor variables that are of particular interest for this analysis: mental illness, gender and abuse history. The first variable discussed is mental illness, and how the variable of ‘mental illness’ was constructed using the mental state indicator scales within the RAI-MH.

The RAI-MH evaluates the needs of psychiatric patients in key areas of life. The RAI-MH contains items and mental illness scales that have shown to have strong reliability and validity (Martin et al. 2009; Hirdes et al. 2002; Gibbons et al, 2008). The mental health scales are composite scales which are made up of several items from the RAI-MH tool. These indicators collectively form various mental health status symptom scales. Scale cut-offs that indicate the level of severity of mental illness symptoms have been identified by interRAI, and validated by several studies (Martin et al. 2009; Hirdes et al. 2002; Gibbons et al. 2008; Brown, 2010). For the purpose of this research, the Mental Illness Symptom Summary measure was used, which was created by Brown (2010) for use in the Prevalence of Symptoms of Mental Illness and the Mental Health Care Need of Adults Inmates in Correctional Facilities report. The RAI-MH scales within the Summary Measure are:

The Short Positive Symptoms Scale (PSS-Short) combines the scores of four different mental state indicators. These indicators are; hallucinations, command hallucinations, delusions and abnormal thought process (Hirdes et al., 2011). The PSS score may range from 0 to 12. A higher score indicate more positive symptoms (Hirdes et al., 2011)..A score of 0 indicating no psychotic symptoms, a score of 1-2 indicating the presence of mild to moderate psychotic symptoms and a score of 3 or more indicating severe psychotic symptoms

The Depression Rating Scale (DRS) combines scores of seven mental state indicators, including; sad facial expressions, tearfulness, negative comments, anxious complaints, fears/phobia, persistent health complaints and persistent anger (Hirdes et al., 2011; Brown, 2010). The DRS scores range from 0 to 14, a score of 1 to 5 indicates the presence of moderate depression, and 6 or more symptoms of severe depression.

The Negative Symptoms Scale (NSS), also referred to as Ahedonia, combines scores from four mental state indicators, including: anhedonia, withdrawal, lack of motivation and reduced interactions. Scores range from 0 to 12, with a score of 1 to 4 indicating moderate negativity and

withdrawal, and scores of 5 or above indicating severe negative symptoms (Hirdes et al., 2011; Brown, 2010).

The Cognitive Performance Scale (CPS) measures the level of cognitive status, and combines scores for measures of short term memory, cognitive skills for daily decision making, expression, communication skills, and self-performance in eating (Hirdes et al., 2011; Brown, 2010). Scores range from 0-6, 6 indicating very severe impairment (Jones et al. 2010).

Mania scale is the most recently created scale (Hirdes et al, 2011), which combines inflated self-worth, hyper-arousal, irritability, increased sociability/hypers-sexuality, pressured speech and labile affect. The scale is scored from 0 to 20. Scores in the range of 1-5 indicate mild to moderate level of symptoms of mania; scores of 6 or more severe symptoms of mania.

Accurately estimating the prevalence of mental illness among the adult inmates in the sample was of particular importance for analysis. Due to the assessment and sample limitations discussed above, a composite scale of serious mental illness was created in order to correctly identify serious mental illness among adult inmates using the RAI-MH (Brown, 2010). We did have access to survey data for each individual scale item of the mental state indicators discussed above, which included raw scores for each scale as well as the calculated Total Severe Symptoms Score (TSS). A measure of mental illness among the inmates using mental health symptoms was constructed by Brown, 2010<sup>5</sup>. This measure was based on previous research (Teplin & Schwartz, 1989; Lamb, Weingberger and Gross, 2004; Lamberti and Weisman, 2004; Schanda, 2005; James & Glaze, 2006), and the RAI-MH assessments and the embedded composite mental health scales just described. By recoding the five symptom scales, Brown (2010) created a Total Severe Symptoms Score (TSS), which was the sum of the scores on the other scales.

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<sup>5</sup> This scale was created by Dr. Greg Brown of the Institute for Applied Social Research, Nipissing University. It is used in the Final Report, *The Prevalence of Symptoms of Mental Illness and the Mental Health Care Needs of Adult Inmates in Ontario Correction Facilities* – prepared for the Ministry of Community Safety and Correctional Services.

1. PSS score recoded: 0 through 2 = 0, 3 through highest = 1
2. DRS score recoded: 0 through 5 = 0, 6 through highest = 1
3. NSS score recoded: 0 through 5 = 0, 6 through highest = 1
4. MSS score recoded: 0 through 5 = 0, 6 through highest = 1
5. CPS score recoded: 0 through 1 = 0, 2 through highest = 1

The TSS was then recoded as a Serious Mental Illness indicator, identifying those who had a score of three or more, and therefore a high number of severe symptoms of mental illness. For the purpose of this research, those who not only had a high number of severe symptoms of mental illness (3 or more), but also those who had a moderate number (1 or more) of severe symptoms of mental illness were of interest. TSS was recoded as a symptom of severe mental illness variable, dummy coded as 0 = no presence of serious mental illness symptoms, or 1 = moderate or severe number of symptoms of mental illness. Table 2 presents the prevalence of moderate or severe symptoms of mental illness for N=522 sample compared to the reweighted MDO N=522 sample, as well as a breakdown of the scales after re-coding included within the TSS.

**Table 2**

Frequency of Moderate and Severe Mental Illness: MDO Data vs. MDO Weighted Sample

	MDO Data (n =522)	MDO Weighted Sample (n = 522)
<b>SMI</b>		
Moderate/Severe	249 (47.7%)	209 (39.8%)
No Symptoms	265 (50.8%)	311 (59.5%)
missing	8 (1.5%)	4 (.7%)
<b>PSS</b>		
Score 0-2 (0)	486 (93.1%)	488(93.3%)
Score 3-highest (1)	31 (6.0%)	34 (6.1%)
missing	5 (1.0%)	4 (.4)

**Table 3 continued.**

Frequency of Moderate and Severe Mental Illness: MDO Data vs. MDO Weighted Sample

	MDO Data ( <i>n</i> =522)	MDO Weighted Sample ( <i>n</i> = 522)
<b>DRS</b>		
Score 0-5 (0)	513 (98.3%)	514 (98.2%)
Score 6-highest (1)	3 (.6%)	2 (.2%)
missing	6 (1.1%)	8 (1.6%)
<b>NSS</b>		
Score 0-5 (0)	383 (73.4%)	487 (93.0%)
Score 6-highest (1)	133 (25.5%)	33 (6.4%)
missing	6 (1.1%)	2 (.4%)
<b>MSS</b>		
Score 0-1 (0)	482 (92.3%)	498 (95.3%)
Score 2-highest (1)	35 (6.7%)	22 (4.2%)
missing	5 (1.0%)	3 (.5%)
<b>CPS</b>		
Score 0-1 (0)	463 (88.8%)	455 (87.2%)
Score 2-highest (1)	51 (9.7%)	67 (12.1%)
missing	8 (1.5%)	3 (.7%)

It is recognized that almost half of the unweighted sample (47.7%) and 40% of the MDO weighted sample reported a moderate to severe number of mental illness symptoms, which could be identifying too many offenders as having mental illness. However, it was felt necessary to use this lower threshold to include those offenders that were not only exhibiting a large number of severe mental illness symptoms, but also those affected by a moderate number of severe mental illness symptoms, which in the literature is also seen as important in contact with the criminal justice system.

The second independent variable of particular interest is the experience of physical, sexual or emotional abuse. Also included within this scale is whether a family member has experienced abuse. The measure of abuse therefore measures the exposure to a potentially traumatic event, rather than measuring the subjective experience of trauma. The RAI-MH assessment tool has an embedded scale for trauma, but for the purpose of the research question, victimization, and more specifically physical, sexual and emotional abuses experienced by the offenders, as well as their exposure to these traumatic events by family members are of particular interest. The RAI-MH indicates whether any of

the types of abuse were experienced never (0), more than a year ago (1) within the last year (2) or within the last 7 days (3). An abuse scale was created by calculating the score on the following variables:

1. Sexual assault/abuse: recoded 0 = no abuse, 1 = abuse experienced
2. Physical Assault/abuse: recoded 0 = no abuse, 1 = abuse experienced
3. Emotional Abuse: recoded 0 = no abuse, 1 = abuse experienced
4. Physical, sexual, emotional abuse experienced by a family member: coded 0 = no, 1 = yes

The Cronbach's alpha for the four abuse scale items was .63 and was made stronger by the inclusion of the item which refers to abuse experienced by a family member. Similar to that of the mental illness variable, the experience of any abuse or exposure to a traumatic event related to abuse by an offender was of most importance. For this reason, an abuse variable was created which indicates no history of experienced abuse/exposure to trauma = 0, history of abuse/exposure to trauma experienced = 1. The table below displays the prevalence of abuse for the N=522 sample compared to the reweighted MDO N=522 sample and the LSI –OR only sample (n =262)

**Table 4**  
Frequency of Abuse: MDO Data vs. Weighted Sample

	MDO Data Sample (N=522)	MDO Weighted (N = 522)	MDO Weighted Sample LSI Only (N= 262)
<b>Abuse Scale</b>			
Yes	435 (83.3%)	381 (73.0%)	217 (82.7%)
No	87 (16.7%)	141 (27.0%)	45 (17.3%)
<b>Physical Abuse</b>			
Yes	311 (59.6%)	226 (43.2%)	143 (54.6%)
No	206 (39.5%)	292 (55.8%)	114 (43.6%)
missing	5 (1.0%)	5 (.9%)	5 (1.8%)
<b>Emotional Abuse</b>			
Yes	317 (60.7%)	298 (57.1%)	151 (57.7%)
No	195 (37.4%)	217 (41.6%)	104 (39.7%)
missing	10 (1.9%)	7 (1.4%)	7 (2.6%)

**Table 5 continued**

Frequency of Abuse: MDO Data vs. Weighted Sample

	MDO Data Sample (N=522)	MDO Weighted (N = 522)	MDO Weighted Sample LSI Only (N= 262)
<b>Sexual Abuse</b>			
Yes	149 (28.5%)	123 (23.6%)	61 (23.4%)
No	364 (69.7%)	393 (75.2%)	194 (74.2%)
missing	9 (1.7%)	6 (1.2%)	6 (2.4%)
<b>Abuse Experienced by Family Members</b>			
Yes	272 (52.1%)	260 (49.8%)	139 (53.0%)
No	243 (46.6%)	259 (49.6%)	120 (45.7%)
missing	7 (1.3%)	7 (.7%)	3 (1.2%)

One limitation of this variable is that it does not specifically capture trauma exposure in childhood. Most of the literature links abuse in childhood related to mental illness and offending and it would have been ideal to capture this. However, the available data did not include information on the timing of the abuse experienced.

Finally, gender will be included as one of the main predictor variables. In the MDO sample N=522, there are 106 (20.3%) females and 416 (79.7%) males. In the MDO weighted sample N =522, the sample includes 88 (16.8%) females and 435 (83.2%) males. Re-contact, as well as abuse and mental illness will be compared by offender gender. The models will be discussed following a brief discussion of the OTIS/LSI-OR data.

### 3.5.5 OTIS/LSI-OR Data

The Ministry of Community Safety and Correctional Services data were derived from the Offender Tracking Information System (OTIS). The sample includes 550 sentenced female offenders who were released from an institution between January and September of 2005. OTIS, LSI-OR and recidivism data was also received for 534 sentenced male offenders. Re-contact with the criminal



justice system was defined, for the purpose of this study as any new re-contact with the criminal justice system, even if related to the original offence, resulting in a return to custody. Once released, any violation of a probation order or of the conditional release related to the original offence would constitute re-contact. Every offender within the male and female OTIS/LSI-OR samples was cross-referenced with the offender re-contact file to identify any re-contacts. A new variable was then created and coded as 1 or 0 to identify whether the offender had indeed had a re-contact or not. This variable will be used as the dependent variable for initial data analysis.

The independent variables included in the analysis from the LSI-OR/OTIS dataset will be the most significant predictors of re-contact, included based on the discussed literature and chosen based on the analysis. The variables of gender, age and aboriginal status are taken from the OTIS database variables, while the other variables of interest are created from the LSI-OR assessment. As discussed above, the total LSI-OR score will most likely be the strongest predictor of re-contact, and it may be difficult to construct strong variables, such as addictive behaviour, sexual abuse and mental illness for comparison purposes, as these items within the assessment tool are not strong predictors of re-contact without the power of the entire tool. Another issue, as stated above, is that as these variables are already contained within the total LSI-OR score, when included individually they would most likely be insignificant in a model that also includes the total LSI score. The mental illness data are also quite limited in the OTIS/LSI-OR sample, this may limit the ability to compare the OTIS/LSI-OR sample to the MDO sample. However, the use of this data will still be very important as it will aid in the comparison of the data on a univariate and bivariate level, as well as demonstrating the predictive ability of the total LSI score, as well as other significant predictors that may be included as controls.

Based on the data and the variables discussed, a model will be constructed in order to predict re-contact. These proposed models will be discussed below.

### 3.6 Models

Each consecutive model will build on the original model. The original model will simply test which predictors of re-contact, excluding gender, abuse and mental illness, have the most predictive power. As stated above, the total LSI score will be included as a control variable, along with other variables which may prove to be significant. Several variables will be tested for inclusion as control variables but due to the nature of the LSI, it is assumed that they may be subsumed by the LSI score. The next model will include gender, followed by a model which includes gender and mental illness entered in as individual variables. As the variance hopefully increases, it will be demonstrated that not only males and females differ in regards to rates of re-contact, but also in terms of how their mental illness relates to their rates of re-contact. The fourth model will then test how the gender and mental illness interact and affect the power of the model to predict re-contact. Depending on what the interaction contributes to the power of the fourth model, the abuse variable will then be added to see if it is possibly another variable which may better predict re-contact. Again, based on the significance of adding in the variable of abuse, the interaction of gender and abuse will be modeled to see if being female, and having experienced abuse increase the possibility of re-contact. Finally, a three way interaction between mental illness, gender and abuse will hopefully prove the proposed hypothesis that being female, mentally ill and having experienced abuse have the strongest model strength in predicting recidivism. Depending on the significance of each model, the final model would be presented as:

**Table 6**

Final proposed model which includes Gender, Mental Illness and Abuse as Independent Variables as well as Interactions

Dependent Variable	Predictor Variables	Interactions
Re-Contact	Controls Female Mental Illness	(Female x MI)
	Abuse	(Abuse x Female) (Abuse x MI) (Female x Abuse x MI)

### 3.7 General Limitations

General limitations of the methods and data are mainly due to the sampling method of collecting the MDO project data. Due to the correctional facility research setting and the fact that offenders assessed were not picked at random, the data should be looked at with some caution. The focus of the research, which was known prior to offender volunteering, may have caused bias in the selection of research subjects. This would then distort the distribution of variables of interest. This will be addressed with the propensity weighting technique discussed above. Another limitation is the use of the RAI-MH assessment instrument in a correctional setting. Assessments relied heavily on self-reporting, which may possibly inflate estimates of mental illness. The observational aspects of the RAI-MH assessments were also affected by the self-reported nature of the assessments. Finally, while it would have been ideal to have a great number of female offenders in the sample, this was not possible. The number of women in Ontario correctional facilities is low compared to that of men. Women were oversampled to try and correct for this, but still only make up 20 percent of the sample.

### **3.8 Conclusion**

Presented above was the approach, the methods and the data that will be used in order to answer the research questions. In this chapter we discussed OTIS/LSI-OR and MDO datasets, along with the analysis technique of logistic regression.

In the analysis chapter to follow we will present the results of the analyses of MDO project data, and the Ministry provided LSI-OR data. Univariate analyses will aid in showing that the MDO project data is in fact able to generalize to the Ontario adult inmate population. Bivariate analysis will also be conducted to demonstrate the relationships between each of the predictor variables and in particular the relationships between re-contact and the predictor variables. Finally, the models and results will be presented along with a discussion of the results.

## Chapter 4

### Results

#### 4.1 Introduction

The primary research objective of this project was to determine whether men and women offenders differ in terms of their risk re-contact and the role of the key variables of mental illness and abuse. Mental illness and abuse were chosen because it is believed that these factors lead to re-contact, but also that they may also contribute to the risk of offending in the first place, among both men and women. As discussed in the literature review above, high percentages of male and female offenders have reported experiencing abuse in the past and, compared to the general population, male and female offenders suffer from symptoms of mental illness at a considerably higher rate. The results chapter will explore the findings from the data analysis and answer whether these factors do indeed contribute to re-contact, and whether men and woman who have been abused or are mentally ill are more likely to re-offend.

The analysis technique of logistic regression was used because of its ability to predict dichotomous outcomes, in this case, whether an offender was in contact with the justice system after release. Using the variables of gender, mental illness, and the experience of abuse as well as other contributing control variables, a model which fit the data best, and most successfully predicted re-contact, was identified. The results of this analysis will be presented below, including which variables were significantly related to re-contact and which combinations of variables best predicted re-contact. Using these models, this chapter addresses our main research question; whether men and women differ significantly in relation to re-contact, whether those who have experienced abuse or suffer from mental illness more likely to offend and whether mental illness and abuse affects offender re-contact differently for men and for women.

## 4.2 Baseline Risk Factors for Re-Contact

Because other factors also contributed to the risk of offender re-contact, it was necessary to statistically control for them in order to estimate the true influence of gender, mental illness and abuse on re-contact. The total LSI-OR score, which measures offender recidivism risk, was chosen as the main control variable. While there are several constructs identified by the literature as predictive of re-contact, including addictive behaviour, homelessness, and crime severity, the total LSI-OR assessment score was used as the main control variable because the score is used as a validated risk assessment measure by the Ontario Ministry of Community Safety and Correctional Services and contains all variables addressed in the “What Works” literature as the main predictors of recidivism (Gendreau, Little & Goggin, 2006). The LSI-OR assessment captures all of these factors except for age, gender and race. Age, gender and aboriginal status were included as variables in the model separate from the LSI-OR variable. Using the total LSI-OR score versus individual predictors as variables in the model produced a better fitting model for predicting re-contact. Other factors such as homelessness and substance abuse were included in the early models, but they did not increase the classification or the predictive ability of the models.

One issue that did have to be addressed by using the LSI-OR score as a variable was that not all offenders had a recorded LSI-OR assessment score. This is because only offenders who had been sentenced were administered the LSI-OR assessment. Therefore, all offenders who were remanded to custody, but had never been sentenced or previously sentenced did not have an LSI-OR assessment score. Because of the amount of missing data if all cases were included in the analysis, only cases that had an LSI-OR assessment score were included in the final analysis. The resulting number of cases was reduced from N=522 to N =398. When the weights were applied to the data, the total number of cases with an LSI-OR score was equal to N=262.

The resulting MDO data (N=262) and the univariate analysis will now be discussed. In addition, the LSI-OR/OTIS data, mentioned in the Chapter 4, will be discussed below. The LSI-OR/OTIS data were used for comparative purposes and to demonstrate that the non-randomly collected MDO data could be generalized to a larger offender population.

### **4.3 Univariate Analysis**

The MDO data, which included only those cases that had a recorded LSI-OR assessment score, were the main data of interest and was the data used in order to build the final logistic regression model predicting re-contact. However, as mentioned above, the LSI-OR/OTIS data were also of importance for the data analysis and were used for comparison purposes, to help judge whether that the MDO data were representative of an Ontario provincial correctional population. The control variables of interest that were included in the final model are presented in Table 5. The LSI-OR/OTIS data, which are retrieved from the Offender Tracking Information System (OTIS) from the Ministry of Community Safety and Correctional Services, included 550 sentenced female offenders and 534 sentenced male offenders who were released from an Ontario provincial correctional institution between January and September of 2005. As stated above, these data were used for comparison purposes

**Table 7**

Comparison of MDO project sample &amp; LSI-OR/OTIS sample

	MDO Data ( <i>n</i> =262)	LSI-OR/OTIS Data ( <i>n</i> =1084)
Aboriginal Identity		
Yes	23 (9%)	109 (10%)
No	238 (91%)	975 (90%)
Age (mean)	34.12	39.10
Total LSI-OR Score (mean)	21.85	21.40

Within the MDO sample, 9% reported Aboriginal identity, while 10.1% of the LSI-OR/OTIS sample reported an Aboriginal identity. The mean age for the LSI-OR/OTIS data was five years higher at 39 versus 34 years of age for the MDO data. This could be due to the weighting effects and the fact that the LSI-OR/OTIS data were truly randomly selected, while the MDO data were not. Lastly, the total LSI-OR score for both samples were very similar with the MDO sample at 21.85 and the LSI-OR/OTIS sample at 21.40.

#### **4.3.1 Gender, Mental Illness and Abuse History**

The variables of particular interest for this research; gender, mental illness and abuse history are presented in Table 6. The MDO sample and the LSI-OR/OTIS sample are both presented for comparison purposes.



**Table 8**

Gender, Mental Illness and Abuse History Variables of MDO project sample &amp; LSI-OR/OTIS Sample

	MDO Data ( <i>n</i> =262)	LSI-OR/OTIS Data ( <i>n</i> =1084)
Gender		
Male	211 (80.5%)	534 (49.3%)
Female	51 (19.5%)	550 (50.7%)
Moderate/Serious Mental Illness		
Yes	104 (39.6%)	N/A
No	155 (59.1%)	N/A
Abuse History		
Yes	217 (82.7%)	554 (51.1%)
No	45 (17.3%)	427 (39.4%)
missing		103 (9.5%)

Comparing the control variables of the two samples, we can see that, based on these characteristics, the MDO sample is fairly similar to 1084 randomly selected offenders from the Ontario provincial offender database. Unfortunately, issues arise when attempting to compare serious mental illness and abuse. While it would have been ideal to use the LSI-OR/OTIS data beyond a univariate or bivariate level of analysis, the data did not permit this. While gender was clear-cut, based on the LSI-OR/OTIS data, it was impossible to create a mental illness variable with any confidence. This was due to a large amount of missing data on several items pertaining to mental illness. The abuse variable was much more reliable, comprising of the physical abuse, sexual abuse, emotional abuse and family violence items on the LSI-OR assessment. These items created a scale with a strong Cronbach's alpha (.794), but was re-coded into 0 or 1 for ease of comparison with the LSI-OR/OTIS sample. A score of 0 was given if the offender answered no to all victimization questions, a score of 1 was assigned if the offender answered yes to at least one of the victimization questions. Important to note is that the MDO sample reported a much higher instance of abuse (79.2%) versus the LSI-OR/OTIS which only 51% of offenders reported abuse. This could be due to the very different methods of reporting for these variables. While the RAI-MH survey captured any

past and present abuse, the LSI-OR was not specific. The RAI-MH abuse scales also include instances of abuse experienced by family members, while the LSI-OR does not record this information. The abuse and gender variable will be examined further in the bivariate analyses presented below.

Also important to note, and which will be addressed in the discussion chapter, is the fact that abuse was a part of the LSI-OR assessment and therefore included within the LSI-OR total score. There may be some concern that this would lead to statistical redundancy if the total LSI-OR score and an abuse variable derived from the RAI-MH assessment tool were both included in the final model. Because of the different methods of reporting for each tool as well as the fact that there was such a huge difference between the two sets of data and the report of abuse – both variables were included in the model with a fairly high level of confidence. Also, the strength of the LSI-OR assessment was based on the total score, and not the individual components.

The final variable of interest was the dependent variable indicating re-contact. While the comparison between the two samples was broken down in the previous chapter, Table 7 presents the relationship between the original MDO sample and the LSI-OR/OTIS sample. From this you can see that, in the MDO sample, a slightly higher percentage (62.1% vs 57.4%) had re-contact with the criminal justice system.

**Table 9**

Re-contact variable: MDO Sample and LSI-OR/OTIS sample compared

	MDO Data ( <i>n</i> = 262)	LSI-OR/OTIS data ( <i>n</i> = 1084)
Re-Contact		
Yes	166 (63.5%)	622 (57.4%)
No	96 (36.5%)	462 (42.6%)

## 4.4 Bivariate Analysis

### 4.4.1 All Risk Factors as they Relate to Re-contact

In order to choose the baseline risk factors for re-contact for inclusion in the model, it is important to look at the bivariate relationship between all of the covariates and how they relate to re-contact. Because of the various issues with the LSI-OR/OTIS data, there was a lack of confidence when examining all of the variables beyond a univariate level. That being said, the bivariate relationships between the gender, abuse and re-contact variables from the LSI-OR/OTIS sample will be examined.. Gender and re-contact were analyzed further as there was minimal missing data on these items and the information was provided by the Ministry and not contained within the LSI-OR assessment. Abuse was also examined further because of the reliability of the abuse scale, as indicated above.

The first step in the bivariate analysis was to look at how all the variables that were to be included in the model related to each other. Tables 8 and 9 shows the relationship of each variable to the dependent variable, re-contact.

**Table 10**

Correlation with Re-contact: MDO Data (n=262)

Variable	Pearson Correlation	Sig. (2-tailed)	N
Aboriginal Identity	- .120	.053	262
Age	.074	.239	258
Total LSI-OR Score	.260**	.000	262
Gender	.127*	.039	262
Abuse	.051	.407	262
Mental Illness	-.092	.141	259

\*\* . Correlation is significant at the 0.01 level (2-tailed)

\* . Correlation is significant at the 0.05 level (2-tailed)

As displayed in the table above, the variables that were not significantly related to re-contact at the bivariate level were aboriginal identity, age, abuse and mental illness. All of the other variables were significantly correlated with re-contact. Gender and re-contact were significantly and positively correlated, [ $r = .127$ ,  $n = 262$ ,  $p < .039$ ], meaning females were more likely to re-contact. Also, the total LSI-OR risk assessment score was highly and positively correlated to re-contact [ $r = .260$ ,  $n = 262$ ,  $p < .001$ ]. Although the abuse and mental illness variables were not significantly related to re-contact, as indicated in Table 8 and 9, mental illness was significantly and positively correlated with both gender and abuse.

Looking further into the bivariate relationships, crosstabs and the related chi-square values were produced to indicate further if there were significant relationships between the dichotomous covariates and re-contact. Table 9 displays the results from this crosstab analysis.

**Table 11**

Bivariate Relationship between Dichotomous Covariates and Re-contact: MDO Data (n=262)

Variable	$\chi^2$	df	Sig. (one-tailed)
Aboriginal Identity	3.556	1	.075
Gender	4.535	1	.036
Abuse	.729	1	.400
Moderate/ Serious Mental Illness	1.911	1	.188

The only variable that was significant was the gender variable. 76.5 percent of woman offenders had a re-contact with the criminal justice system, and only 60.5 percent of men had a re-contact. Abuse and mental illness did not show significant chi-square results. Of those offenders who had re-contacted, 64.5% had a reported history of abuse and 57.8% of those who had not experienced abuse had re-contacted. In addition, of those offenders who had a moderate or severe mental illness, their chance re-contacting was slightly higher than not re-offending. 58.7 percent of those offenders who had a mental illness had a re-contact. For those offenders who did not have a mental illness, 67.1% had a re-contact.

#### 4.4.2 Bivariate Analysis of Gender, Abuse and Mental Illness

Even though gender, abuse and mental illness were not necessarily significant at a bivariate level, how they relate to one another, and not just to re-contact, was of interest. These variables were analyzed further in order to assess their relationships to one another. These interactions are explored in Table 10 below.

**Table 12**

Results of Crosstabular Analysis of Abuse, Gender and Serious Mental Illness: MDO Data (n=262)

Variables	$\chi^2$	df	Sig. (one-tailed)
Female x Abuse	5.73	1	.014
Female x Mental Illness	9.05	1	.004
Mental Illness x Abuse	11.35	1	.001
Mental Illness x Female x Abuse	5.27	1	.033
Abuse x Mental Illness x Re-contact	4.49	1	.044
Abuse x Female x Re-contact	3.05	1	.019

The relationship between gender and abuse was significant. 94.1% of women had experienced abuse compared with only 80% of men. The relationship between gender and mental illness was also significant. 58.8% of women and only 35.7% of men were identified as having a mental illness. The relationship between mental illness and abuse was also significant [ $\chi^2 = 11.348$ ,  $df = 1$ ,  $p < .001$ ]. Of those who had a mental illness, 92.3 percent reported experiencing abuse. These results were promising, demonstrating at the bivariate level that there was a significant relationship between the key three variables addressed in the research question. A higher percentage of women versus men had been abused and were mentally ill, and there was also a significant relationship between being abused and being mentally ill. When analyzing how these three variables interact together, the crosstabs again produced a significant chi square value. For women who had experienced abuse, 59.2% were identified as suffering from a mental illness, and only 40.6% of men who had experienced abuse also had a mental illness (Table 10).

When re-contact was added to the cross-tabulation, the relationship between abuse, mental illness and re-contact was significant for those who had been abused [ $\chi^2 = 4.489$ ,  $df = 1$ ,  $p < .044$ ].

For those offenders who had been abused, the relationship between abuse, gender and re-contact was also significant [ $\chi^2 = 3.050$ ,  $df = 1$ ,  $p < .019$ ]. For those offenders who had experienced abuse and were suffering from mental illness, 57.3% had re-contacted. But similarly, for those offenders who were not abused and who were not suffering from mental illness, 54.1% had re-contacted. When re-contact was added to the table with abuse and gender, it was found that, for women who had experienced abuse, 75 percent had a re-contact with the criminal justice system compared to 61.3% of men.

Overall, at the bivariate level of analysis and for the purpose of the research question, the significant relationships between being a woman, having experienced abuse and suffering from mental illness were encouraging. While the bivariate analysis did not show a significant relationship between re-contact and abuse and mental illness, the significant relationship between gender, mental illness and abuse to one another still make them important for inclusion in the model for predicting re-contact. If they have an effect on each other, will there be any significance when they are all entered into the model predicting for re-contact. In order to find whether men and women offenders differ with respect to their criminal justice re-contact, specifically when considering their mental health status and previous experiences of abuse, the predictor variables discussed above will be used in order to create a logistic regression model of re-contact.

## **4.5 Creating the Final Model**

### **4.5.1 First Steps**

Based on the literature and the data available, several variables were chosen for possible inclusion in the model, in order to control for other confounding effects of re-contacting with the criminal justice system. In addition to consideration of the “What Works”, or recidivism risk literature bivariate relationships with re-contact were assessed. Finally, each variable was assessed

with regard to the contribution made to the logistic regression model for predicting re-contact.

Control variables were chosen based on literature, as well as the hypothesis that their inclusion in the model would improve model fit. Control variables were: aboriginal status, age, and the total LSI-OR score. The results from the analysis are presented below in Table 11.

**Table 13**  
Results from Logistic Regression Analysis: First Model with Control Variables(n=241)

Goodness of Fit Statistics	-2 Log Likelihood	Classification	ROC	AsympSig(.05) Curve			
Control Model – Fit Statistics <sup>a</sup>	285.703	.66(%)	.665	.001			
Variable Statistics	B	S.E.	df	Sig.	EXP(B)	CI for EXP(B) Lower	(95%) Upper
Aboriginal Identity	-1.049	.527	1	.047	.350	.125	.984
Age	.010	.015	1	.501	1.010	.981	1.039
Total LSI-OR Score	.074	.018	1	.000	1.077	1.041	1.115

a The goodness of fit statistics show the strength of the model when only the control variables are included in the model. These statistics will be compared with the statistics derived from the various models.

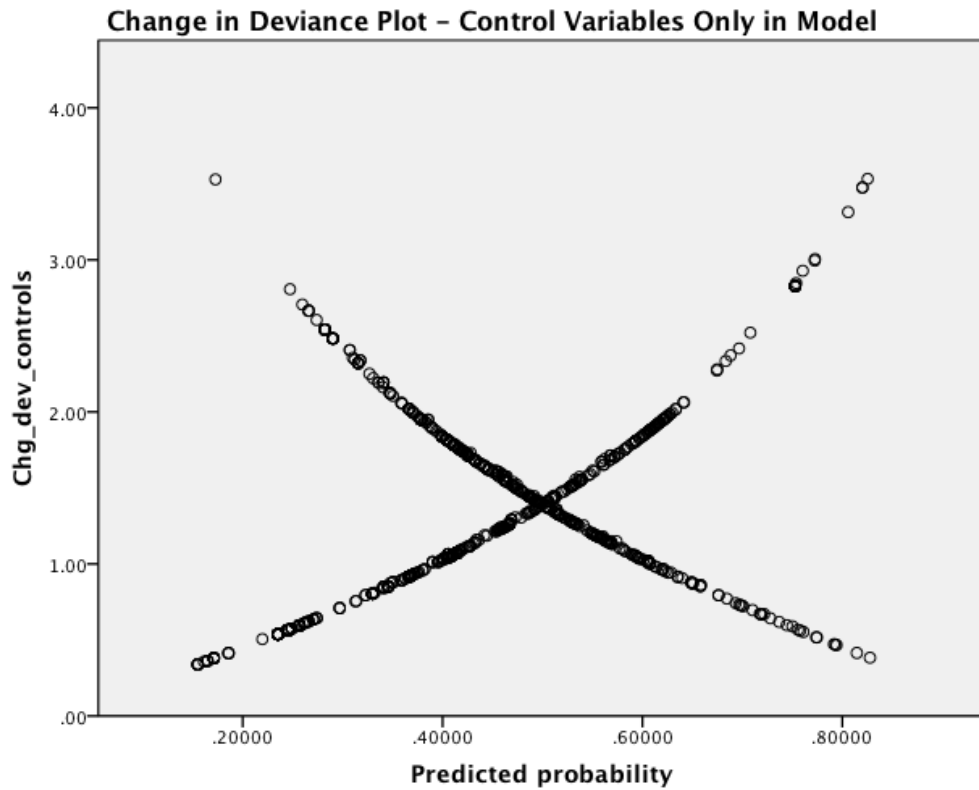
Of the three variables included in the model, total LSI-OR score and aboriginal identity were significant predictors of re-contact. Overall, this model correctly classifies cases as having re-contacted 66% of the time, as well as correctly predicted 144 of 241 cases to re-contact. This is compared to the baseline model, containing the constant only, which correctly predicted re-contact at a rate of 65.4%. The model therefore improved classification by about 1%. The variables entered into the model were not highly correlated with one other, and were proven to be reliable predictors, the goodness of fit statistics returned fairly good results considering the nature of the data. The Hosmer-Lemeshow statistic was not significant ( $p < .510$ ), which indicates that the model adequately fit the data (Kleinbaum & Klein, 2010). Other goodness of fit tests also showed that the model did adequately



fit the data. The change in deviance plot identifies residuals that are not well predicted by the model. The change in deviance plot, which uses the squared studentized residuals and the saved predicted probabilities, shows that few cases are poorly fit by the model. The curve that extends from the lower left to the upper right corresponds to those who did not re-contact. The few cases that disperse from the line indicate individuals who did not recidivate but have large-model predicted probabilities are poorly fit by the model (Kleinbaum & Klein, 2010).

**Figure 2**

Change in Deviance Plot: Control Variables Only in the Model

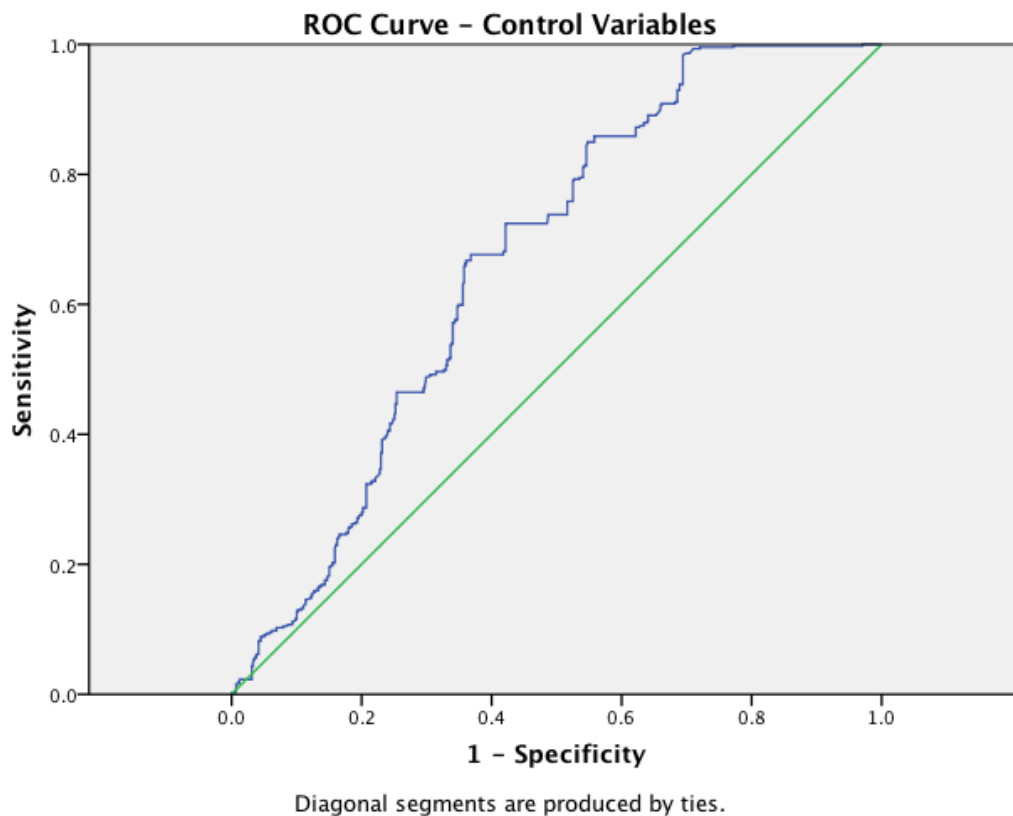


Finally, using the predicted probabilities saved from the model, an ROC curve analysis was done, based on the model that only included the control variables. The ROC curve produced an area under the curve (probability that re-contacting for a randomly chosen positive case will exceed the result for

a randomly chosen negative case) result of .661. The result was also significant ( $p < .001$ ), meaning that the model created significantly contributes to predicting re-contact. The ROC curve analysis for the control variables is presented in Figure 3.

**Figure 3**

ROC Curve: Control Variables



#### 4.5.2 Next Steps

The next step towards building the model was to include each of the variables of interest: gender, serious mental illness and abuse. They were included one at a time to see what kind of impact they had on the predictive ability of the model.

As discussed in Chapter 4, there were several interactions that were to be tested. These interactions were created and included in various models but only the interaction between mental

illness and gender were included in the final model (see Appendix C). This interaction was highly significant. While the adding of each interaction slightly improved the overall model, the improvement was very minimal and the mental illness by gender interaction remained the only significant interaction. The significance was removed when the three way interaction between mental illness, gender and abuse was added into the model. None of the other interactions proved to be at significant at the .05 level. The interaction term for abuse by gender increased the classification of the model by .1 from 74.4 to 74.5. The interaction between abuse and mental illness also increased the classification of the model, but by less than 1% [74.4% to 75.2%], but the interaction was not significant [ $p < .219$ ]. The interaction terms and how they behaved within the various models are presented in Appendix C.

Figure 4 below shows the relationship between abuse and gender and how they relate to re-contact. While the interaction was not included in the final model, it is interesting to see graphically how abuse relates to gender and re-contact. Both male and female offenders have experienced a significant amount of trauma, it affects a higher percentage of the sample of female offenders. Of the 48 female offenders who re-contacted, 46 (95%) had been abused or exposed to abuse. Of the 169 male offenders who re-contact, 126 (75%) had been abused or exposed to abuse.

**Figure 4**  
 Relationship between Re-contact and Gender by Abuse

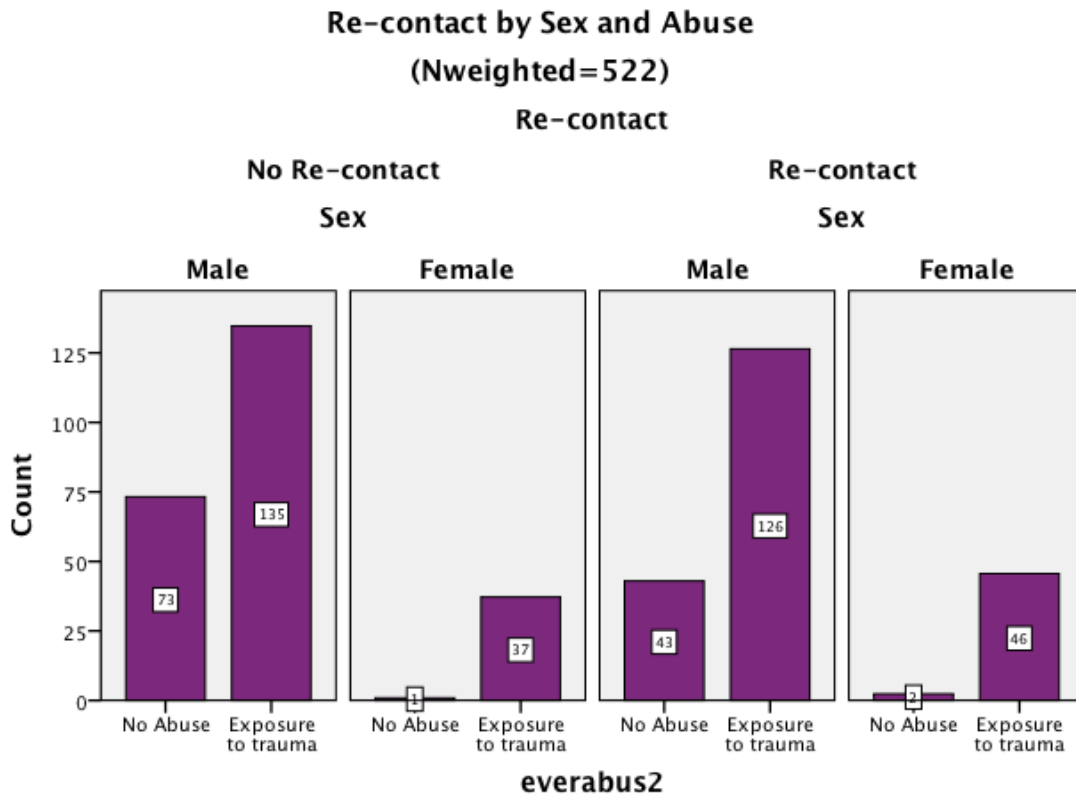


Figure 5 demonstrates how mental illness and gender relates to re-contact. The graph shows the number re-contacting by gender and mental illness. Of the 168 males in the sample who re-contacted with the criminal justice system and were returned to custody, 53 (31%) exhibited symptoms of moderate to severe mental illness. Of the 48 females who re-contacted with the criminal justice system, 31(65%) had symptoms of moderate to severe mental illness.

**Figure 5**  
 Relationship between Re-contact and Gender by Mental Illness

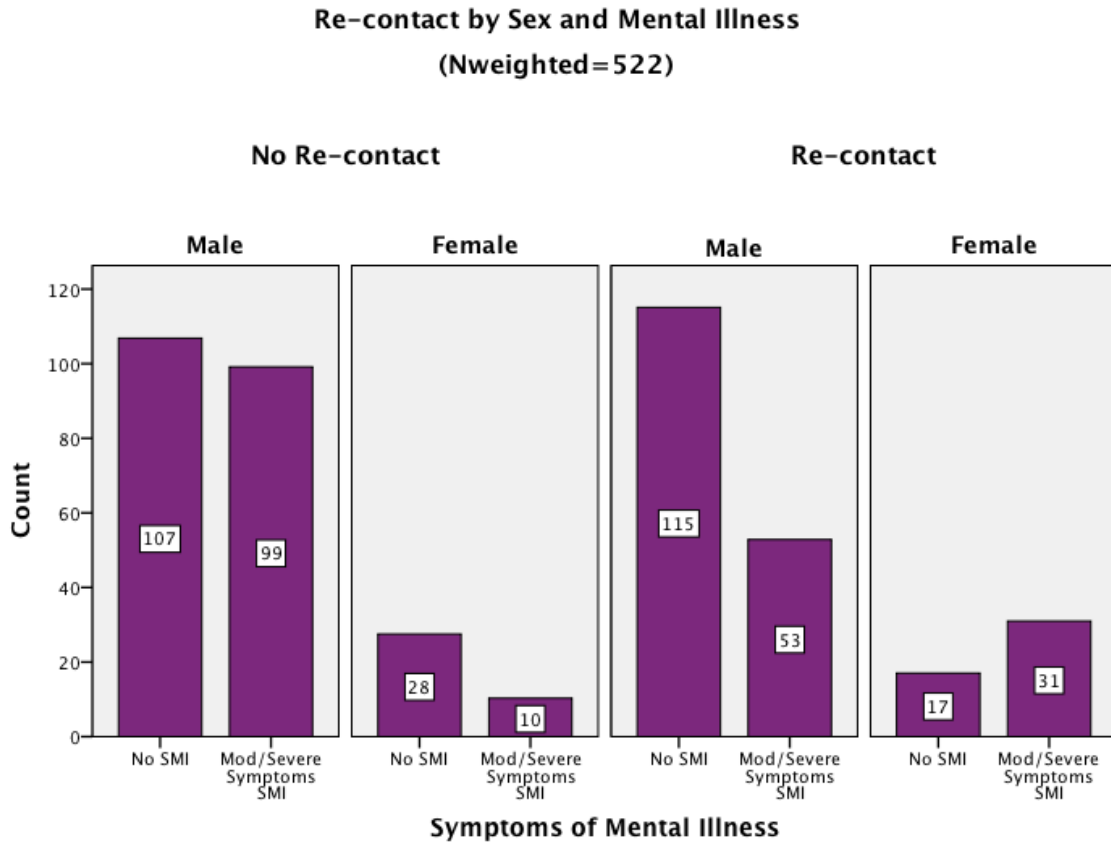


Table 14 displays the changes in the model when each variable was added, as well as the variables that were significant at each stage of the model. The change in deviance and Cook’s distances goodness of fit graphs for identifying influential cases are also displayed below in Figure 5 and 6.

Model 1 includes only the LSI-OR score, aboriginal identity and age. As stated above, LSI-OR score and age were both significant predictors of re-contact. In Model 2, the first variable of interest, gender, was added. Gender was not a significant predictor of re-contact, and only LSI-OR score was a significant predictor. Due to the small number of females in the sample, the confidence interval displayed a large margin, predicting with 95% confidence that the odds of re-contact for

gender (being female) were somewhere between .963 and 4.43. Mental illness was added to Model 3. In this model, LSI-OR score and gender were significant predictors. The confidence interval for gender, reporting with 95% confidence, that the odds of re-contact for gender (being female) was between 1.03 and 5.06. Model 4 included gender, mental illness and abuse. When abuse was added to the model, the only significant variable was the LSI-OR score.

The final model, Model 5, included LSI-OR score, age, aboriginal identity, gender, mental illness, abuse and the interaction between gender and mental illness. Again, LSI-OR score was significant, as well as mental illness and the interaction between mental illness and gender.

Figure 5 demonstrates the cases that are poorly fit by the model. A majority of the cases were concentrated near .000, meaning that the cases were fit well within the model.

**Table 12**

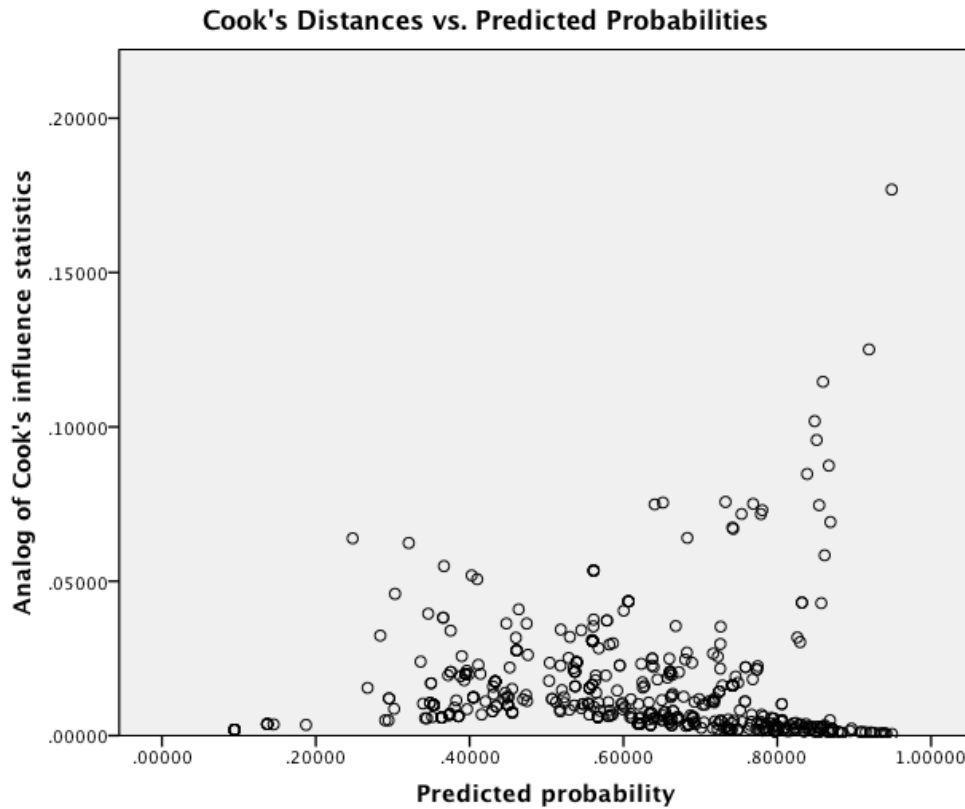
## Model Comparison: Addition of Gender, Serious Mental Illness and Abuse

Variable	Model 1			Model 2			Model 3			Model 4			Model 5		
	B (Exp(B))	CI(95%) Lower	Upper	B (Exp(B))	CI(95%) Lower	Upper	B (Exp(B))	CI(95%) Lower	Upper	B (Exp(B))	CI(95%) Lower	Upper	B (Exp(B))	CI(95%) Lower	Upper
LSI-OR Score	.07* (1.08)	1.04	1.12	.08* (1.08)	1.04	1.12	.08* (1.08)	1.05	1.12	.08* (1.08)	1.04	1.12	.09* (1.09)	1.05	1.13
Abor. Identity	-1.05* (.35)	.13	.98	-.98 (.37)	.13	1.07	-.72 (.49)	.156	1.52	-.74 (.48)	.15	1.49	-.64 (.53)	.16	1.75
Age	.01 (1.01)	.98	1.04	.01 (1.01)	.98	1.04	.01 (1.01)	.98	1.04	.01 (1.01)	.98	1.04	.01 (1.01)	.98	1.04
Female				.73 (2.07)	.96	4.43	.82* (2.28)	1.03	5.06	.78 (2.19)	.98	4.89	-.45 (.64)	.23	1.80
Mental Illness							-.35 (.71)	.38	1.33	-.39 (.68)	.36	1.29	-.91* (.40)	.20	0.83
Abuse										.29 (1.34)	.64	2.79	.36 (1.44)	.68	3.03
Mental Illness x Female													2.60* (13.43)	2.55	7.80
Log Likelihood	285.70			281.98			276.29			275.70			265.55		
Significance	.001			.001			.001			.001			.001		
Classification	66(%)			67.4(%)			68.4(%)			69.1(%)			74.4(%)		
ROC (C) Statistic	.670			.679			.680			.683			.684		
<b>N</b>	241			241			238			238			238		

\*Variables significant at the .05 level

**Figure 6**

Cook's Distances vs. Predicted Probabilities Model 5

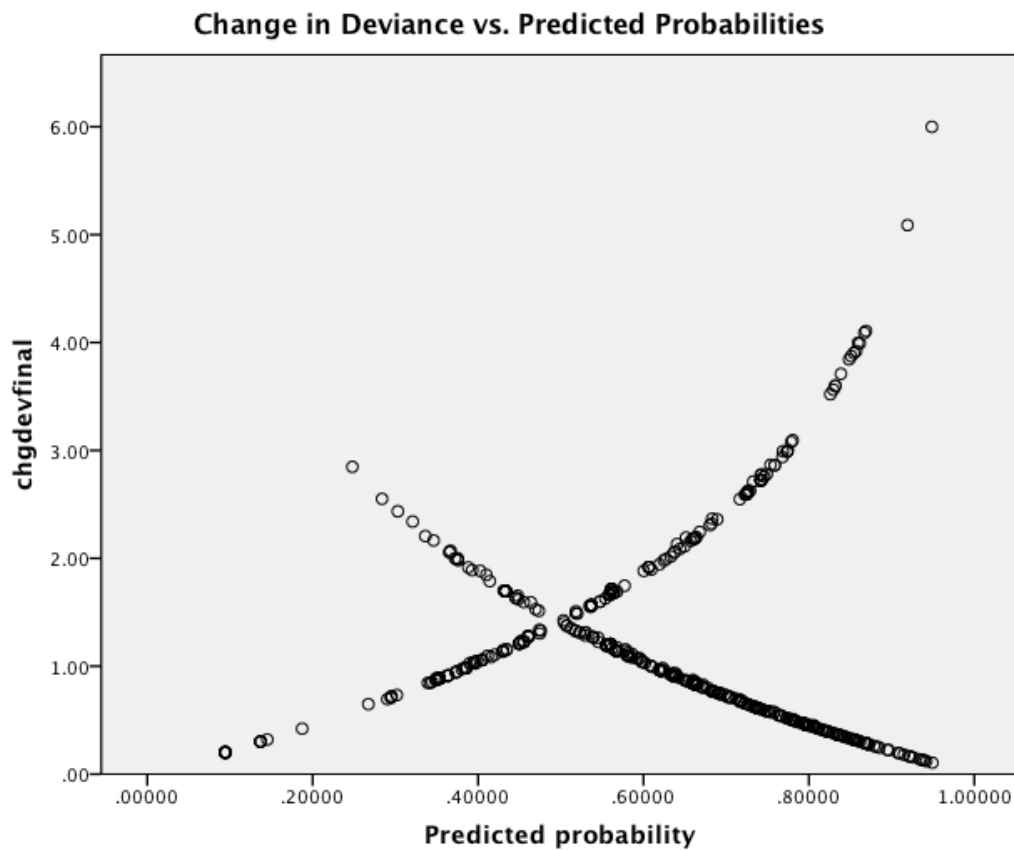


A change in deviance plot was also constructed to check the goodness of fit of the model. The change in deviance plot, Figure 6, shows the cases that were poorly fit by the model and that there only seemed to be a couple of cases that were poorly fit by the model. The cases in the upper right hand corner represent offenders who have not re-contacted, but who have large model-predicted probabilities. Despite these cases, the model fits the data quite well (Kleinbaum & Klein, 2010).



**Figure 7**

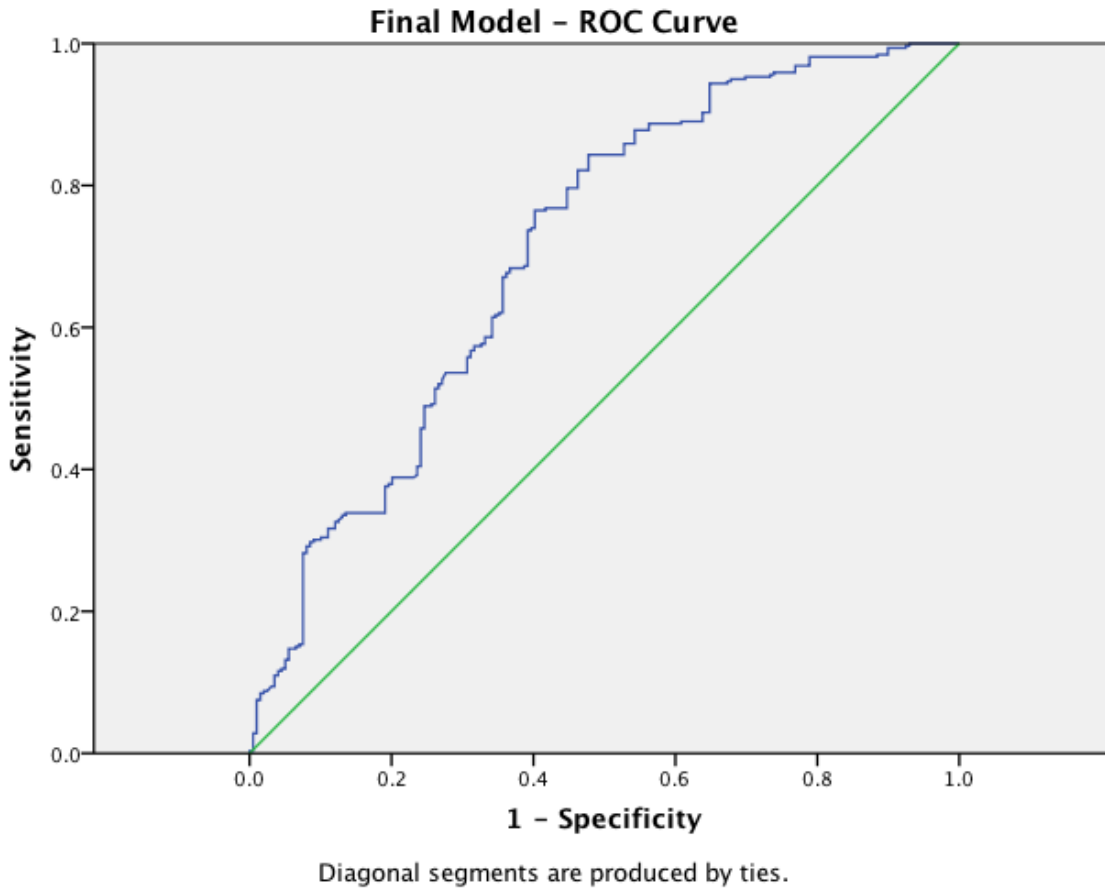
Change in Deviance vs. Predicted Probabilities Model 5



As each variable was added, the overall ability for the model to accurately classify cases increased, from 66%, with just the controls to 74.4% when gender, mental illness, abuse and the mental illness gender interaction were added to the model. The final model, Model 5 correctly predicted 185 cases to re-contact out of 238 included in the analysis. The area under the curve statistic produced by the ROC analysis increased slightly when each variable was added, only dropping a small amount when abuse was added to the model. The area under the curve statistic for the final model was .684 (Figure 8)].

**Figure 8**

Receiver Operating Characteristics (ROC Curve), Model 5



The total LSI-OR score remained a significant predictor in the model (6), as gender, mental illness and abuse were added. Gender became significant when mental illness was included in the model, but was not significant after abuse and the mental illness x gender interaction were included. Mental illness was a significant predictor, only when the interaction was included, [ $p < .014$ ]. The variables and their contribution to the final model are presented below in Table 15 – Model 6.

**Table 13**

Final Model – Model 6 – Logistic Regression Model of Re-contact (n=238)

	B	df	Sig.	Exp(B) Upper	C.I. for EXP(B) Lower	
LSI-OR	.09	1	.00	1.09	.16	1.75
Age	.01	1	.66	1.01	.98	1.04
Abstatus	-.64	1	.30	.53	1.05	1.13
Female	-.45	1	.39	.64	.23	1.79
Mental Illness (MI)	-.91	1	.01	.40	.20	.83
Abuse	.36	1	.34	1.44	.68	3.03
MI x Female	2.60	1	.00	13.43	2.55	7.80
Log Likelihood		265.55				
Significance		.00				
Classification(%)		74.4(%)				
ROC (C)		.684				

Of the control variables, the total LSI-OR score was the only significant predictor of re-contact, [ $p < .001$ ]. The regression coefficient also indicated that an increase in the LSI-OR score was positively related to re-contact [ $B = .087$ ], and the odds ratio demonstrated that a one unit increase on the LSI-OR score increased the odds of re-contact by 1.09 times. Of the variables of interest, mental illness and the interaction term between gender and mental illness were significantly related to re-contact [Mental Illness,  $B = -.91$ ,  $p < .014$ ], [MI x Gender,  $B = 2.60$ ,  $p < .002$ ], but mental illness was still negatively related to re-contact. The interaction term presented that the effect of being female and mentally ill versus all other possible categories increased the odds of re-contact by 13.43.

For an easier interpretation of the model coefficients, they were converted into probabilities. First, looking at the total LSI-OR score separately, and holding all other variables at 0, for offenders with a mean LSI-OR score of 21.85 (high risk of re-offending (20-29), the probability of re-contact

was .617, or 62%. The probability for re-contact when looking at all of the control variables together, with all other variables held at 0, the probability for re-contact became .518, or 52%.

The predictive probability of gender, mental illness and abuse were examined individually and together. In this model, being female produced a probability of re-contact by .133 or 13%. The probability of re-contact with the criminal justice system if an individual was a mentally ill offender, was .09 or 9%. Lastly, for the mental illness by gender interaction, meaning the effect of being female and mentally ill versus all other possibilities (female and not mentally ill, male mentally ill or not mentally ill), the probability of re-contact for a mentally ill female in the model was .76, indicating almost a 76% chance of re-contacting (when all other variables are held constant). For men who were not mentally ill, the probability of re-contact was only 20%, or .198.

While the initial bivariate analysis did demonstrate significant and positive associations between gender (being female), abuse and re-contact (Table 8 and 9), the three-way interaction was insignificant [Appendix C]. Looking further into the relationship between the three variables, Table 10 shows that at a bivariate level, that while abuse and mental illness may not be significantly related to re-contact, these three variables were all significantly related to one another. Therefore, how these three variables contribute to offender re-contact, and especially female re-contact is still a valid consideration and warrants further discussion. The final logistic regression model, predicting for re-contact, finds mental illness is significantly related to re-contact but as a negative relationship. However, the interaction term in the model demonstrated that being the effects of mental illness on re-contact were different from men and for women. As just mentioned above, the probability of re-contact, without any other factors for a female who is mentally ill in this model was .763 or 76%.

While caution should be used when inferring these results to the greater offending population, as the number of females in the sample were quite small, there are potential policy implications for these findings. The analysis demonstrates what was presented in the literature; women offenders are

significantly different from men in terms of their characteristics, and this suggests that they may have different needs. The focus on the needs of male offenders only, and the implied assumption that female and male offenders are the same, may therefore be considered a problem for gender equity. Not adequately addressing the context of female offending may lead to female offenders, without appropriate interventions, cycling in and out of the criminal justice system. The recent media attention given to the issues surrounding female criminality is encouraging, and we hope that this project will further support the argument that women in prison may benefit from specialized treatment. The implications of these findings will be presented in the discussion and recommendation chapters to follow.

## **Chapter 5**

### **Discussion**

#### **5.1 Discussion**

Extensive literature on female offenders suggests that men and women have very different experiences in terms of how they come to be involved with the criminal justice system. This is true for both the types of crimes they commit, and why they commit them in the first place. While men tend to commit more violent crimes, women tend to be less engaged in violent crimes and their involvement in crime can often be related to the influence of drugs and alcohol or poverty. Crime committed by women can often be caused by the need for food and shelter. The present research explored whether male and female offenders differ in terms of their mental health needs and, if a difference exists, whether it affects the probability of re-contact with the criminal justice system. This chapter will discuss the implications of the findings from this research and how it could influence policy with regard to the effective treatment of the female offender.

##### **5.1.1 Do Men and Women Differ in Terms of their Mental Health Needs?**

As stated in the results chapter and hypothesized in the literature review, this research found that male and female offenders in the sample had significantly different likelihood of mental illness, abuse histories, and experience of re-contact with the justice system. The first question to be discussed is whether there is a difference between male and female offenders and their mental health needs, including their abuse histories? Although based on a small sample, the bivariate relationship showed that female offenders in this sample were more likely to be suffering from a mental illness, and have a history of abuse, as anticipated.

As suggested by the literature, women's criminal behaviour is often related to the need for survival, whether this be a need for food and shelter, to take care of her children or to cope with her

emotional hardships with substances which stems from abuse, poverty, substance and mental illness (Steffensmeirer & Allen, 1995). The reason for women's re-contact with the criminal justice system when compared to men could be due to the fact that the situations experienced by many women before incarceration are not much different than those return to upon release. High rates of alcohol and drug use among female offenders are another, possibly related, explanation for a women's re-contact with the criminal justice system. Singer et al. (1995) stated that the abuse of alcohol or drugs is a major contributing factor to women's criminality. Cox (2009) referred to substance abuse as one of the key coping mechanisms for women offenders, which therefore puts them in closer proximity to crime and a criminal lifestyle. This relates to the difference in gender as mental illness and substance abuse is often found among mentally ill offenders, who are often female.

Literature on women offenders also supports the notion that women in prison have higher rates of mental illness than the general population, also higher than male offenders (Laishes, 2002; Cox, 2009; Blanchette & Motiuk, 1996; Hartwell, 2001; Singer et al., 1995; Keavney & Zauszniewski, 1999; Farley & Barkan, 1998). The Mental Health Strategy for Women Offenders, developed by Correctional Service Canada, stated that, except for anti-social personality disorder, women outnumber men in all major psychological diagnoses (Laishes, 2002). Reports from New Zealand and the United Kingdom also report similar findings (Brinded et al., 2001; UK Department of Health, 1997). The results of the present study confirmed these findings by demonstrating a significant relationship between mental illness and gender, with 58.8% of women identified as having a mental illness compared with only 35.7% of men. Also noted in the literature, female offenders suffering from mental illness are significantly different from men because of their unique circumstances that have often led to their mental illness. This includes being more likely to have histories of abuse, low socioeconomic status, dysfunctional family lives, and a parent with a mental illness. While male offenders may have come from similar backgrounds, women may cope with

difficult circumstances differently, and these may be manifest as mental illness, or drug or alcohol addiction. A lack of social or familial support, in conjunction with mental illness and drug addiction may then lead to involvement with the criminal justice system (Laishes, 2002).

The bivariate analyses presented here found that women offenders were more likely than men to have had personal histories that included abuse. As presented in the literature review, many studies that have explored the relationship between a history of victimization and criminal involvement have found that women in jail have a much higher incidence of histories of physical and sexual abuse than women in the general population. While the literature also states that men in jail have high incidence of abuse compared to men in the general population, the way in which women cope with the abuse is much different than that of men (Laishes, 2002; Messina et al., 2007; Hollin & Palmer, 2006; Cox, 2009; Green et al., 2005; Hartwell, 2001; Browne et al., 1999; Siegel & Williams; 2003; Widom & Ames, 1994; Bloom, Chesney & Owen, 1994). The results of this study demonstrated a significant relationship between abuse history and gender, yet there were a high proportion of both men (78.9%) and women (93.3%) reporting having experienced physical, sexual or emotional abuse. A study by McClellan, Farabee & Crouch (1997) looked at the relationship between offender gender and abuse and found that a similar proportion of both men and women in jail had been physically abused (23%). However, 30% of women and only 18% of men had been emotionally abused, and 26% of women and only 4% of men reported being sexually abused as children. This indicates that, even when male and female offenders are found to be equally likely to have experienced abuse, the types of abuse experienced tends to be different for women than for men.

Finally, the relationship between gender, abuse and mental illness is important to address. The analysis showed that there was a significant relationship, with 91.8% of those offenders who had a mental illness also reporting a history of abuse. Although we could not identify abuse that had taken place in childhood, as opposed to more recently, this is somewhat consistent with the literature that



relates mental health problems in adulthood to abuse suffered during childhood and beyond (Farley & Barken, 1998). Messina (2007) looked at childhood abuse and household dysfunction as it related to mental health as well as drug dependent behaviour. It was found in the study that a cumulative exposure to childhood maltreatment was positively related to adult mental and physical health, not only women, but also for men.

As a final step in the bivariate analysis, re-contact was added to test the relationship between abuse, mental illness and re-contact, as well as between abuse, gender and re-contact. These relationships were found to be significant, indicating that women with mental illness and who experienced abuse were the group most likely to have re-offended. Female offenders who were mentally ill and experienced abuse had a 52% or .522 probability of re-contacting. This compared with .278 or 28% for male offenders who were mentally ill with an abuse history.

Male and female offenders likely differ in terms of their mental health needs. The research demonstrated that female offenders in the study are significantly more likely to be suffering from mental illness and that they are also more likely to have experienced abuse. The multivariate analysis further demonstrated the importance of gender. While mental health or gender alone did not significantly predict the probability for re-contacting with the criminal justice system, the interaction between gender and mental health did. This will be discussed further below, as we address the question of whether offender gender differences affect the probability of re-contact.

### **5.1.2 Do Offender Gender Differences Affect the Probability of Re-contact?**

At the bivariate level, female offenders were not only more likely to be suffering from a mental illness but they were more likely to re-contact. At the multivariate level of analysis, the interaction between gender and mental illness significantly predicted re-contact. This indicated that females suffering from a mental illness were significantly more likely to re-contact than mentally ill

or non-mentally ill male offenders. Therefore, based on this research, offender gender may actually affect the probability of re-contact.

Other than the total LSI-OR assessment score, which is derived from the validated risk assessment tool used by the Ontario Ministry of Community Safety and Correctional Services, mental illness and the interaction between gender and mental illness were the only significant predictors of re-contact in the final model. The reason for this significant interaction could be attributed to the abuse histories, drug dependency, household dysfunction and other life circumstances related to the mental illness of female offenders as discussed above. It could also be attributed to the homelessness, poverty, substance abuse, and a close proximity to anti-social associates that are characteristics of many mentally ill offenders, male or female. These characteristics and the fact that female offenders in the study were more likely to be mentally ill may have led to the significance of the interaction.

Suffering from a mental illness alone significantly predicted the risk of re-contact, with the opposite effect than the one hypothesized. Those with mental illness were less likely to experience re-contact than those without mental illness. This finding does support the literature, which found that mentally ill offenders were not more likely to re-contact than a non-mentally ill offender (Bonta, Hanson & Law, 1998). As stated above, there are many factors that are characteristic of mentally ill male and female offenders that could be attributed to re-contact. These factors are also quite similar to factors predicting re-contact for non-mentally ill male and female offenders. Bonta, Law & Hanson's (1998) meta-analysis of the predictors of recidivism of mentally disordered offenders concluded that the risk factors for offender recidivism were the same for those offenders with and without a mental disorder, meaning that offender mental illness was not necessarily a contributing factor to recidivism, but other factors such as substance abuse and criminal associates, which were stated above, were the reason for recidivism.

Also mentioned above, female offenders were found to be more likely to have experienced abuse, but abuse history was not significantly related to re-contact in the final logistic regression model. Regardless of the many research studies that point to a history of abuse as a determining factor in a women's initial involvement with crime, the lack of predictive power in terms of re-contact supports Bonta et al's (1995) findings. In their study of the predictors of recidivism among female offenders, Bonta et al. (1995) found that a history of victimization among women offenders actually reduced the risk of offender re-contact. Lowenkamp et al. (2001) found similar results. Although female offenders in their sample were more likely than male offenders to report childhood abuse, their abuse had no predictive value for future offending.

In this research, lack of predictive power of the abuse variables in the logistic regression models could be explained by the inclusion of the LSI-OR assessment score in the models. The LSI-OR tool from which the score is derived does include abuse history and therefore the LSI-OR variable could have captured some of those effects. A similar effect may have occurred with the aboriginal status variable, as aboriginal identity is also included in the LSI-OR score. The fact that aboriginal identity was not a significant predictor in the final model was most likely due to the effects of items contained within the LSI-OR assessment score, as well as the fact that the item was based on self-reported data. Some offenders who were interviewed may have chosen not to report their aboriginal status.

The other interactions that were noted in the results chapter but were not included in the final model should also be discussed. The interactions between gender and mental illness, abuse and gender, abuse and mental illness and the three-way interaction between gender, abuse and mental illness were tested but did not were not included in the final model due to their non-significance and lack of contribution to the overall model (Appendix C). The reason for this could be attributed to the abuse variable in the model. While history of abuse is noted as having an important contribution to

contact with the criminal justice system, the abuse variable in the MDO data might not have captured exactly what would have been hoped. Most of the literature points to childhood trauma and its relation to contact with the criminal justice system. Unfortunately, the abuse variable only captured whether abuse had occurred within the last year, or more than a year ago. The abuse may have occurred in childhood, but based on the indicator it could not be assumed. Having a variable which indicated whether the abuse occurred in childhood, as an adult or both may have been more beneficial and returned more significant results.

### **5.1.3 Limitations**

Certain cautions need to be taken when interpreting and drawing inferences from the results of this study. With regards to sampling bias, even though propensity score weighting was used, and it is a widely-accepted statistical approach for addressing sample and selection bias (Brown, 2010, Hirano & Imbens, 2001), because of the self-selection and the fact that female offenders were over-sampled, findings should be interpreted with caution.

The results of the interaction between gender and mental illness in the final model should also be interpreted with caution. The interaction is based on a small number of cases (12%) and this limits the ability to draw inferences to the larger female offending population. In a comparison model using the un-weighted data, (Appendix B) the number of females with mental illness made up 14% of the sample and the interaction within this model was also significant. Although this increases our confidence that the significance of the interaction was not due to the weighting scheme, the small sample raises concern, and the confidence interval indicates a wide margin in the estimating the parameters. Due to the small number of cases of females with mental illness, there is a need for further research with mentally ill female offenders in order to support the findings of this study.

Another limitation pertains to the use of the RAI-MH assessment instrument. Although studies of reliability and validity of the scales embedded within the RAI-MH have demonstrated that the tool for mental health assessment has good inter-rater reliability and validity (Martin, 2009), the use of this tool within the correctional facility poses some limitations. Answers to some questions within the assessment tool were difficult for the interviewers to accurately capture in the correctional facility setting. Questions such as meal preparation, substance abuse, wandering, and managing medications were not always able to be captured due to the nature of the question, or the lack of staff resources to address them. As a result of an original study (Brown, 2010), an interRAI Mental Health for Correctional Facilities assessment tool has been developed in order to better reflect the nature of a correctional setting (Hirdes et al., 2008).

Despite the limitations of the data, the results of this research helped to answer the research questions. Not only did the research find that male and female offenders may differ in terms of their mental health needs, these potential differences affected the probability of re-contact with the criminal justice system. Because female offenders in this sample were found to be more likely to be mentally ill, this mental illness and the factors contributing to their mental illness make them significantly more likely to re-contact. With these findings it is important to further discuss and assess the policy implications of these findings. Also to be discussed are the possible next steps in order to further this area of research and fill in the gaps in our understanding of this issue.

## Chapter 6

### Recommendations and Conclusion

#### 6.1 Recommendations

From our review of the literature on female offenders it was found that mental illness and a history of abuse are common characteristics of female offenders. Only a small minority of female offenders are violent offenders, as they women tend to commit crimes based on the need for economic survival> Female offenders are mainly young, many are mothers, and they tend to come from backgrounds of low socioeconomic status, low education and poor employment histories.

Based on this literature, this project sought to further investigate whether male and female offenders differed in terms of other critical characteristics, and also in their likelihood of recidivism, or re-contact with the justice system. We hypothesized that men and women offenders may differ in terms of their mental health, and that this may be related to differences in their histories of abuse and of substance use. This is important, because gender differences in these predictors of recidivism would suggest that male and female offenders differ in terms of their mental health needs. Indeed, it was found that men and women offenders do likely have different mental health needs, as being female and mentally ill significantly increased the chance of re-contact with the criminal justice system.

This research supports the notion that male and female offenders are different, and that in order to provide the most effective treatment they should be treated differently. In particular, programming should address the unique needs of female offenders who, we have argued, have tended to be ignored in programme design. This means addressing unique aspects of female offender's lives, including potential poverty, histories of abuse, substance abuse, and mental health needs in order to reduce the likelihood of re-contact with the justice system. Laishes (2002) has made a similar argument, and states that gender appropriate services must respond to the complex experiences of

incarcerated women. For example, a drug treatment program may not be effective if issues related to mental illness, such as mental health and history of abuse, are not addressed. Life circumstances that also may need to be addressed in order for a woman to be successfully rehabilitated may include economic and social independence, family reintegration, stable housing, parenting skills, managing medications, as well as mental health problems. It may be of further help for women released from jail to continue to engage in help seeking behaviour in order to manage their often-stressful life circumstances.

Besides the need for effective treatment while incarcerated, and even after incarceration, another important consideration is the fact that incarceration among females continues to rise. Bloom, Chesney-Lind, and Owen (1994) state that, “instead of policy of last resort, imprisonment has become the first-order response for a wide range of non-violent and petty offenses and women have been disproportionately swept up in this trend” (p. 2). This problem could also be attributed to a lack of understanding of female offenders and the problems they may be facing, and which could be better dealt with by other systems, including mental health care and social services. Without further research and a greater understanding of female offending; there could potentially be negative impacts on the criminal justice system as the numbers of incarcerated women continue to rise.

If there was a greater understanding of why females come into contact with the criminal justice system, prison may not end up being the first choice for dealing with many female offenders. This could present significant policy implications as more cost effective measures may be used to address some female criminality. If gender specific programming was available within the community, especially for women committing non-violent and petty offenses, it may prove to be more effective in reducing the chance for re-contact as well as reducing the cost for the Ministry of Corrections.

Beyond the quality of the available programming, an issue to consider is whether programming is available at all for women who are incarcerated. Many women in the Ontario provincial correctional population are remanded and are therefore incarcerated for a very short period of time. Helpful programming may be available to women in these facilities, but those not incarcerated long enough might not be eligible. This could lead to some women cycling in and out of correctional facilities without ever receiving any rehabilitation.

Where do we go from here? From this research we can conclude that mental illness and abuse histories are related to female offending, and that female offenders who are suffering from mental illness have a greater chance of being in contact with the criminal justice system again after they are released. But more research needs to be done in order to further understand how women's adverse life events are related to criminal offending. A better understanding of these relationships will assist in discovering how mental illness, abuse and other factors relate to female offending and what the best approaches to treatment may be. More data and research needs to be available in order to inform the creation of gender appropriate services.

## **6.2 Conclusion**

In Canada, female offenders receive little attention because they only account for a small portion of the overall offending population. Women in jail are perceived as having a minimal impact on the overall criminal justice system, and therefore attention and resources are focused elsewhere, particularly on the needs of male offenders. The hope is that the more research that is done with female offenders, the more attention that will be brought to their specific needs. Recognition of why many women come into contact with the criminal justice system in the first place, and how their adverse life events affect this contact will be important to inform how women are handled within the system.



While alternatives to jail may not be available in the near future, we hope that remanded and short-stay provincial offenders will receive some guidance while incarcerated or upon release from prison to help cope with the factors that may have contributed to them coming into contact with the criminal justice system in the first place. Women offenders who receive help to deal with these issues may be less likely to turn to crime as a means of economic survival, therefore breaking the cycle of repeated contacts with the justice system.

Mentally ill offenders have recently been receiving increased attention from policy makers in Canada. This is promising for the several mentally ill female offenders who are in the justice system. Yet, even with this increased attention, goal of appropriate treatment is still far from being achieved. It is therefore not only important to bring to light the needs of female offenders, but continue to research the needs and the complex situation of mentally ill offenders in contact with the law. An understanding of how to appropriately handle mentally ill offenders, male or female, within the justice system may not only create positive change for mentally ill offenders, but potentially for other inmates and correctional staff as well.

This research may only make a small contribution to the complex issue of mental illness and female offending, but it is our hope that it will make a positive step towards gender appropriate treatment for female offenders, and more effective and specific treatment of mentally ill offenders in general.

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## Appendix A

### Scale Breakdown

**Table 14**

Mental health scales embedded within the Final Model

Scale	Item	Possible Responses
<b>Cronbach's Alpha = .63</b>		
<b>Abuse</b>		<b>Coded for the most recent time of the event</b>
<b>RAI-MH</b> Section J – Stressors	1. Sexual Assault/Abuse	0. Never 1. More than a year ago 2. Last Year 3. Last 7 days
	2. Physical Assault/Abuse	0. Never 1. More than a year ago 2. Last Year 3. Last 7 days
	3. Emotional Abuse	0. Never 1. More than a year ago 2. Last Year 3. Last 7 days
	4. Any experience of physical /emotional/sexual abuse or assault experienced by a family member(s)	0. No 1. Yes
<hr/>		
<b>Mental Illness (RAI-MH) Embedded Scales</b>	<b>Items in the Scale</b>	<b>Scoring of Items</b>
<b>Cronbach's alpha = .61</b>		
<b>Positive Symptom Scale</b> (Reflects Psychotic Symptoms) Cronbach's Alpha = .60	Hallucinations	0 = Not exhibited in last 3 days
	Command Hallucinations	1 = not exhibited in last 3 days but was reported to be present
	Delusions	2 = Indicator exhibited on 1-2 of last 3 days
	Abnormal Thought Process	3 = Indicator exhibited daily in last 3 days

**Table 14 continued**

Scales Imbedded within the Final Model

<b>Embedded Scales</b>	<b>Items in the Scale</b>	<b>Scoring of Items</b>
<b>RAI-MH</b>		
<b>Depression Rating Scale</b> (Describes the mood states Of an individual) Cronbach's Alpha = .63	Negative Statements	0 = Not exhibited in last 3 days
	Persistent Anger	1 = Not exhibited in last 3 days but was reported to be present
	Unrealistic Fears	2 = Indicator exhibited on 1-2 of last 3 days
	Repetitive Health Complaints	3 = Indicator exhibited daily in last 3 days
	Repetitive Anxious Complaints Sad, worried facial expressions Crying or tearfulness	
<b>Negative Symptoms Scale</b> Cronbach's Alpha = .76	Anhedonia	0 = Not exhibited in last 3 days
	Withdrawal	1 = Not exhibited in last 3 days but was Reported to be present
	Lack of Motivation	2 = Indicator exhibited on 1-2 of last 3 days
	Reduced Interactions	3 = Indicator exhibited daily in last 3 days
<b>Mania Scale</b> (Reflects severity of mania) Cronbach's Alpha = .65	Inflated Self worth	0 = Not exhibited in last 3 days
	Hyperarousal	1 = Not exhibited in last 3 days but was Reported to be present
	Irritability	2 = Indicator exhibited on 1-2 of last 3 days
	Increased Sociability/hypersexuality	3 = Indicator exhibited daily in last 3 days
	Pressured Speech Labile affect	
<b>Cognitive Performance Scale</b> (Described the persons cognitive status)	Daily Decision Making	0 = Independent 1 = Modified Independence 2 = Minimally Impaired 3 = Moderately Impaired

**Table 14 continued**

Scales Imbedded within the Final Model

<b>Embedded Scales</b>	<b>Items in the Scale</b>	<b>Scoring of Items</b>
<b>RAI-MH</b>		
		4 = Severely Impaired 5 = No Discernible Consciousness
	Short-Term Memory	0 = Yes, memory OK 1 = Memory Problem
	Expressions	0 = Understood 1 = Usually Understood 2 = Often Understood 3 = Sometimes Understood 4 = Rarely/Never Understood
	Self-Performance in eating	0 = Independent 1 = Set-up Help Only 2 = Supervision 3 = Limited Assistance 4 = Extensive Assistance 5 = Maximal Assistance 6 = Total Dependence 8 = Activity did not occur

**Table 15**

Breakdown of Abuse Scale : Unweighted MDO Sample (n= 522)

Item	Scoring of Item	Frequency (%)	Mean	Std. Dev.
<b>Aggregated Abuse Scale (0-4)</b>	Addition of 4 items	0 = 87(16.7)	2.03	1.36
		1 = 108(20.7)		
		2 = 106(20.3)		
		3 = 115(22)		
		4 = 92(17.6)		
<b>Physical Abuse</b>	0 = Never	0 = 206(39.5)	.78	.744
	1 = More than a year ago	1 = 229(43.9)		
	2 = Last year	2 = 74(14.2)		
	3 = Last 7 days	3 = 8(1.5)		
<b>Emotional Abuse</b>	0 = Never	0 = 195(37.4)	.88	.857
	1 = More than a year ago	1 = 210(40.2)		
	2 = Last year	2 = 80(15.3)		
	3 = Last 7 days	3 = 27(5.2)		
<b>Sexual Abuse</b>	0 = Never	0 = 364(69.7)	.31	.50
	1 = More than a year ago	1 = 138(26.4)		
	2 = Last year	2 = 11(2.1)		
	3 = Last 7 days	3 = 0(0)		
<b>Abuse Experienced by Family Members</b>	0 = No	243(46.6)	.53	.50
	1 = Yes	272(52.1)		

## Appendix B

### Presentation of Models with Weighted and Un-weighted data

**Table 16**

Comparison of Logistic Regression model with unweighted data (n=370) vs. Weighted data (n=238) LSI-OR Cases Only

	Unweighted Data (n=370)				Weighted Data (n=238)			
<b>Classification</b>	73.8				74.4			
<b>ROC</b>	.71				.68			
<b>Variables</b>	<b>B</b>	<b>SE</b>	<b>Sig.</b>	<b>Exp( B)</b>	<b>B</b>	<b>SE</b>	<b>Sig.</b>	<b>Exp(B)</b>
Age	-.004	.012	.710	.996	.007	.015	.664	1.007
Abstatus	-.337	.475	.478	.714	-.638	.611	.296	.528
LSI Score	.096	.016	.000	1.100	.087	.019	.000	1.090
Mental Illness	-.347	.280	.216	.707	-.906	.369	.014	.404
Abuse	-.102	.334	.760	.760	.363	.280	.339	1.438
Female	-.205	.449	.648	.814	-.448	.526	.394	.639
Mental Illness X Female	1.243	.620	.045	3.466	2.597	.848	.002	12.430

## Appendix C

### Interactions

**Table 17**

Logistic Regression Models for re-contact with various interactions included (n=238)

Interaction (Significant Variables)	-2 Log Likelihood	Classification (%)	ROC Curve
<b>Controls</b>	285.703	66.00	.665
• <i>Abstatus</i>			
• <i>LSI-OR Score</i>			
<b>+ Female</b>	281.980	67.40	.679
• <i>Abstatus</i>			
• <i>LSI-OR Score</i>			
<b>+ MI</b>	276.290	68.10	.680
• <i>LSI-OR Score</i>			
• <i>Female</i>			
<b>+ Female x MI</b>	266.450	74.00	.683
• <i>LSI-OR Score</i>			
• <i>Mental Illness</i>			
• <i>Female x MI</i>			
<b>+ Abuse</b>	265.549	74.40	.684
• <i>LSI-OR Score</i>			
• <i>Mental Illness</i>			
• <i>Female x MI</i>			
<b>+ Abuse x Female</b>	265.346	74.50	.682
• <i>LSI-OR Score</i>			
• <i>Mental Illness</i>			
• <i>Female x MI</i>			

**Table 17 Continued**

Logistic Regression Models for re-contact with various interactions included

Interaction ( <i>Significant Variables</i> )	-2 Log Likelihood	Nagelkerke R Squared	Classification (%)	ROC Curve
<b>+ Abuse x MI</b>	263.764	.224	75.2	.671
• <i>LSI-OR Total Score</i>				
• <i>Female x MI</i>				
<b>+ Abuse x Female</b>	262.766	.229	75.2	.671
<b>X MI</b>				
• <i>LSI-OR Total Score</i>				

## Appendix D

### Propensity Weighting

#### The prevalence of symptoms of mental illness and the mental health care needs of adult inmates in Ontario correctional facilities

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March, 2010

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#### 5. Random (Probability) Sampling and the Problem of Non-Random Selection Bias

The goal of random sampling in social science research is to make use of the mathematical principles of probability to draw a small sample of individuals from a larger population such that the composition and characteristics of the sample are, within a small margin of error, a true 'mirror' of the composition and characteristics of the population. Individuals are selected for the sample without their knowledge based on objective mathematical probability, and are then approached by the researcher to participate in the study. From analysis of the smaller, more cost efficient probability sample, researchers can 'infer' or make generalizations about what will also be true in the population from which the sample was drawn. Based on mathematical probability theory, researchers can also estimate the amount of discrepancy or error between the composition and characteristics of the sample compared to the population, and can include this estimate in the form of a 'confidence interval' when inferring the composition and characteristics of the population.

For ethical reasons, the use of random (i.e. probability) sampling techniques is increasingly disallowed in many social science research studies (U.S. Board on Health Sciences Policy & Institute of Medicine of the National Academies, 2006; Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada, 2010).

In particular, and in accordance with the policies of the MCSCS/MCYS Correctional Services/Youth Justice Research Committee (2011), the ethical requirement that consent to participate in a research study be free of real or perceived duress, that it be voluntary, and that it be fully informed precludes the use of probability sampling techniques in almost all situations involving offenders under the authority of MCSCS or MCYS.

The requirement that researchers make exclusive use of voluntary, informed participants in research necessarily causes study samples to be biased, because the participants are not selected on the basis of known, objective principles of mathematical probability, but rather because of their interest and willingness to volunteer to participate. Not all potential participants will be equally likely to volunteer



to participate (e.g. male offenders with a mental illness held on remand may be reluctant to volunteer to participate in a research study for fear of a potential impact on the status of the charges brought against them, while female offenders with a mental illness serving a sentence may be more likely to agree to participate), and so a non-random, differential 'selection bias' is introduced. Non-random bias in the sample can cause the statistical results estimated from the characteristics of the sample participants to be themselves biased, inaccurate depictions of the true characteristics of the population.

## 6. What Is Propensity Score Weighting and Why Is it Used?

A variety of statistical techniques have been proposed by biostatisticians, econometricians, statisticians and social scientists to estimate, and adjust for, non-random bias in a research sample. Most of these techniques are based on the use of a regression model 'instrumental variable' (IV) approach (Winship & Morgan, 1999; Austin, 2011), where a set variables that have been identified as possible sources of bias in drawing the sample (e.g. differences in male/female composition, remand versus sentenced, alcohol or drug addiction) are 'controlled for' by examining their relationship to the dependent variable (e.g. severity of symptoms of mental illness) separately within each of the categories of the possibly biasing variable (e.g. males versus females, remand versus sentenced, etc.). The key limitation associated with the use of regression instrumental approaches is that, with only one non-random sample group included in the analysis, the extent to which the sample, 'controlled for' by making use of possibly biasing variables, actually resembles the composition and characteristics of the population from which it is drawn is still unknown, and IV regression approaches have been shown to produce biased estimates of treatment and/or causal effects (Linden & Adams, 2010).

Propensity score weighting is a more recent and increasingly popular approach to estimating and adjusting for selection bias in non-random samples. Based on the logic of randomized controlled trial (RCT) research designs, propensity score weighting involves 'matching' the non-random 'treatment' sample with a second, 'control' sample, identifying and estimating the effect of potentially biasing variables that differentially determine whether a subject is more or less probable to be found in the 'treatment' or 'control' sample, and using this probability estimate to decrease the weight and influence in the analysis of subjects who are over-represented in the treatment sample; or, alternatively, to increase the weight and influence of subjects who are under-represented in the treatment sample (Freedman & Berk, 2008; Hickman & Suttorp, 2011).

## 7. How Is Propensity Score Weighting Used?

Where the matching 'control' sample has been drawn according to mathematical principles of probability sampling (i.e., is a true random sample), the estimation and application of propensity score weighting to adjust for possible selection bias in the 'treatment' sample can result in an adjusted propensity weighted treatment sample that approximates the characteristics of a randomly drawn sample, and consequently allows for the use of inferential statistics to estimate population parameters (Rosenbaum & Rubin, 1983, 1985; Hirano & Imbens, 2001; McNeil & Binder, 2007; Austin, 2011). According to this procedure, the estimation of the propensity score weights involves the following steps:

1. combine the non-random 'treatment' sample and the random 'control' sample into one large sample;
2. identify the set of variables that may potentially be responsible for bias in determining which individuals volunteered to be in the non-random 'treatment' sample;
3. use a logistic regression model and an iterative estimation process (e.g. backward elimination) to estimate the magnitude of each of the potentially biasing variables in predicting whether an individual case is in the non-random 'treatment' sample or the random 'control sample';
4. evaluate the final model to ensure that it predicts with a high degree of accuracy treatment or control group membership;
5. if membership in either the 'treatment' or 'control' sample was unbiased (equally probable), the estimated probabilities from the logistic regression model for any given case will equal 1.0; where inclusion in the 'treatment' versus 'control' sample is biased, the estimated probabilities will depart significant from 1.0 as either too great ( $>1.0$ ) or too low ( $<1.0$ );
6. by inverting the estimated logistic regression probabilities and standardizing them (to compensate for different sample sizes), a 'propensity score weight' is calculated and applied to each case in the 'treatment' sample - cases that have too great a probability of being in the treatment sample are now 'down-weighted' in their influence and cases with too small a probability of being included in the treatment sample are 'up-weighted' to have more influence; and
7. the resulting propensity score weighted sample, by reducing the influence of cases either too likely or not likely enough to be included in a true random sample, thereby reduces the magnitude of non-random bias in the 'treatment' sample, and approximates the characteristics of a random sample similar in characteristics to the random 'control' sample.

A growing body of research (Love, 2004; Ridgeway, 2006; McNeil & Binder, 2007; Linden & Adams, 2010; Hickman & Suttorp, 2010; Austin, 2011) demonstrates that the propensity score weighting technique is the preferred alternative to conventional methods of addressing the problems of selection bias in non-random samples, and outperforms conventional methods in most applications (Linden & Adams, 2010; Austin, 2011).

## 8. How Is Propensity Score Weighting Used in the Ontario Study?

In the current study of the prevalence of symptoms and mental health care needs of inmates in Ontario correctional facilities, and in the second study of recontact and recidivism, the mental health assessment 'treatment' sample (N=522) was combined with a random 'control' sample of inmates (N=1200) drawn from OTIS database representing inmates incarcerated during the same time period as the mental health assessment sample. A total of nine (9) potentially biasing variables<sup>6</sup> that could impact differentially on whether an individual volunteered to be in the mental health assessment sample were included as predictors of whether any individual case was included in the combined (N=1722) 'treatment' or the 'control' sample. Employing an iterative, backward elimination logistic regression technique, separate analyses were conducted for cases with recorded LSI-OR scores (n=982), and for those with no recorded scores (n=740).

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<sup>6</sup> Including Age, Gender, Aboriginal Status, Region, Correctional Status, Offence Severity, Mental Health Alert, Substance Abuse Alert and Total LSI Score.

For the LSI-OR cases, only Gender, Region - East, Region - North, Correctional Status, Severity of Offence and LSI-OR score were estimated to be statistically significant differences between the nonrandom 'treatment' sample, and the random 'control' sample. For cases without LSI-OR scores, Aboriginal Status, Region - East, Region - North, Correctional Status and Severity of Offence proved to be statistically significant. Both of the estimates logistic regression models correctly predicted in excess of 77% of cases correctly as to 'treatment' or 'control' sample membership, with other tests (the *C* statistic) showing in a high degree of sensitivity (exceeding 85%) in correctly classifying cases. The variables Age, Mental Health Alert and Substance Abuse Alert, potentially important sources of selection bias, are not statistically significant factors in determining membership in the 'treatment' or 'control' samples.

The probability estimates of sample membership derived from the logistic regression analysis were inverted and standardized to arrive at the propensity score weights that were applied to the mental health assessment 'treatment' sample in order to adjust for bias in the sample, and to approximate the characteristics of a random sample based on the characteristics of the random 'control' sample. Application of the propensity score weights to the mental health assessment sample increased the sample size to  $N^W=977$ . The results of the propensity score weighting procedure are reproduced in Table 23 on the following page.

The propensity score weights represent a significant improvement in the sample distribution by Correctional Status and LSI-OR Score, two of the key potential sources of selection bias in the sample.

Significant differences in the regional distribution of the  $N^W=977$  propensity weighted sample and the  $N=8,588$  average daily count persist, though are reduced slightly in magnitude. The imbalance between the mental health assessments completed by region is less a consequence of selection bias and more so of the relatively small size of institutions in the Northern Region and the research team's inability to access the population at the Central North Correctional Centre due to labour relations issues. In the Western Region, the imbalance stems from the deliberate over-sampling in institutions with an identified concentration of Aboriginal inmates. Though the propensity weighting technique is unable to address fully these imbalances in the sample distribution, it is important to note that the imbalances do not stem from selection bias, and that the estimation of the prevalence of symptoms of mental illness is a global (total population) estimate, and consequently no claim is made for the validity of estimates at the regional level.

**Table 14.** Comparison of Selected Demographic Characteristics N<sup>W</sup>=977, N=522 Samples and Population of Adult Institutional Population Average Daily Count (N=8,588) Number and (Percent)

Characteristic	N <sup>W</sup> =977	N=522	N=8,588
Region			
Northern	108 (11.1)***	48 (9.2)***	1,961 (22.8)
Eastern	238 (24.3)	126 (24.1)	1,835 (21.4)
Western	241 (24.6)***	142 (27.2)***	1,494 (17.4)
Central	390 (40.0)	206 (39.5)	3, 299 (38.4)
Gender			
Male	813 (83.2)***	416 (79.7)***	7,993 (93.1)
Female	164 (16.8)***	106 (20.3)***	596 (6.9)
Aboriginal Status			
Aboriginal	63 (6.4)*	43 (8.2)	6,688 (8.5) <sup>7</sup>
Non-Aboriginal	914 (93.6)*	479 (91.8)	72,143 (91.5)
Aboriginal Status <sup>8</sup>			
Aboriginal	174 (17.9)***	125 (23.9)***	-
Non-Aboriginal	802 (82.1)***	397 (76.1)***	-
Correctional Status			
Sentenced	334 (34.2)	339 (64.9)***	2,777 (32.3)
Remand	598 (61.2)	166 (31.8)***	5,415 (63.1)
Other	45 (4.6)	17 (3.3)*	397 (4.6)
LSI-OR Total Score <sup>9</sup>	(n <sup>W</sup> =490)	(n=399)	(n=52,879) <sup>10</sup>
Very Low	20 (4.1)	5 (1.3)***	1,842 (3.5)
Low	41 (8.4)***	13 (3.3)***	6,151 (11.6)
Medium	141 (28.9)	86 (21.6)***	16,555 (31.3)
High	193 (39.3)*	171 (42.9)***	18,986 (35.9)
Very High	94 (19.3)	124 (31.1)***	9,345 (17.7)

Statistically significant difference in proportion compared to population, at \* p<.05, \*\*p<.01, \*\*\*p<.001

Due to intentional substantial over-sampling of female inmates, application of the propensity score weights reduces, but does not completely eliminate a significant difference between the N<sup>W</sup>=977 sample distribution by Gender, and the N=8,588 average daily count distribution.

Similarly, intentional over-sampling of Aboriginal inmates is not fully addressed by the propensity score weighting technique. However, the estimate of the proportion of Aboriginal inmates in the daily population is based on admissions rather than actual count - and given that average counts are normally proportionately lower than the admissions proportion, the N<sup>W</sup>=977 estimate may, in fact, be a more accurate estimate.

<sup>7</sup> Aboriginal Status not available for average count data: 2006/07 admissions data substituted.

<sup>8</sup> 'Aboriginal Status' on the RAI-MH instrument measured by self-report, interviews with staff, file information.

<sup>9</sup> LSI-OR assessments not available for all inmates, as many inmates on remand will not have an assessment on file.

<sup>10</sup> Based on 2006/07 adult institutional admissions data.

In the case of both Gender and Aboriginal Status deliberate over-sampling leads to problems of representation that cannot be fully compensated for by propensity score weighting. Consequently, it is important, as is done in this report, to compare the subgroup distributions of mental health symptoms by Gender and Aboriginal Status by the standardized percentage distribution, rather than in terms of actual numbers.

Given the significant impact of oversampling of female and Aboriginal inmates, the final estimates of the prevalence of symptoms of mental illness were further proportionately weight adjusted to conform with the distribution of Gender and Aboriginal Status in the average daily count population  $N=8,588$ . By making use of the propensity score weighting techniques, confidence intervals, representing the 'margin of error' around each of the prevalence estimates, were constructed.

## 9. Interpreting the Propensity Score Weighted Estimates

Though the propensity score weighting technique is a significant improvement over previous IV regression techniques used for addressing selection bias in non-random samples, propensity score weighting does not completely remove all sources of bias, and use of the technique is dependent upon employing a logic regression model that includes (conceivable) all potential sources of selection bias. In the current Ontario studies, a large number of variables, nine (9) in all, were used to model selection bias and to derive the propensity weight scores. Examination of Table 23 shows that some significant differences remain in the composition and characteristics of the  $N^W=977$  propensity score weighted sample, compared to the  $N=8,588$  average daily count population. Most important, in the distributions of Correctional Status and LSI-OR scores, key variables used in the construction of the population prevalence estimates, few significant differences remain. Though significant differences due to intentional oversampling (not selection bias) remain in the Gender and Aboriginal Status variables, also key components of the population prevalence estimates, these differences also virtually disappear when these variables are later adjusted in the analysis for over-representativeness against the  $N=8,588$  distribution.

Nevertheless, the propensity score weighted sample and statistical estimates derived from it should, as in any social scientific statistical analysis, be interpreted with caution; estimates are not exact, and confidence intervals should be examined to determine how accurate (e.g. how low, how high) the estimates might be; attention should be paid to estimates reported in other similar studies; and recognition must be given to the fact that not all potential sources of bias in the  $N^W=977$  propensity score weighted sample (including random error) have been identified, modeled, and removed.

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