An Empirical Examination of Gender Neutral, Salient, and Specific Risk Factors for Male and Female Criminal Recidivism

by

Andrea Grieves

A thesis submitted to
the Faculty of Graduate and Postdoctoral Affairs
in partial fulfillment of the requirement for the degree of
Master of Arts

in

Psychology

Carleton University
Ottawa, Canada

Abstract

Using components of the Dynamic Factors Identification and Analysis (DFIA; Brown & Motiuk, 2005; Motiuk, 1997) assessment tool as risk predictors, the present study explored whether or not risk factors for recidivism among adult male and female offenders would be the same—gender neutral, stronger for one gender versus the other—gender salient, or only relevant for one gender but not the other—gender specific. A large sample (N = 1530) with equal male and female comparison groups were examined using logistic regression and odds ratios, arguably, the most sensitive and rigorous statistical approach for testing gender differences in recidivism when dichotomous risk predictor variables are used. The results demonstrated that gender salient or specific predictors of recidivism emerged only when the risk factors were broken down into specific individual factors (i.e., DFIA indicators) rather than the all-encompassing global factors, such as the total DFIA measure or the overarching domain areas.

Acknowledgments

First, I would like to thank my thesis advisor, Dr. Shelley Brown, for all of her encouragement, support, and guidance throughout the process of completing my master's degree. Her unwavering determination and positive attitude through all of her endeavors inspires me every day.

I would also like to thank the members of my thesis committee, Dr. Kelley Blanchette, Dr. Don Andrews, Dr. Ralph Serin, Dr. Ron Saunders, and Dr. Brian Tansley for their valuable suggestions and assistance in guiding this research. Additionally, I would like to thank the Correctional Services of Canada Research Branch for providing the database for this research project. Without their support, this research would not have been possible.

I would like to thank a few of my fellow students, Leigh Greiner and Katie Perkins, who endured some difficult challenges alongside me during this past year. Their support and encouragement was instrumental in my accomplishments.

Finally, I would like to thank my family. The support of my parents, especially through the several technical difficulties I experienced with my computer, is forever appreciated. And finally, thank you to my husband, Marc, who always believes in me, supports me, and encourages me to no end.

Table of Contents

List of Tables

List of Figures

List of Appendices

An Empirical Examination of Gender Neutral, Salient, and Specific Risk Factors for Male and Female Criminal Recidivism

It is an undisputed fact that women commit crime differently than men. In Canada, the arrest rate for women is consistently lower than the arrest rate for men, particularly with respect to serious forms of crime (Kong & AuCoin, 2008). Despite this finding, between 1986 and 2005 the rate women were charged with assault more than doubled compared to a 25% decrease for men. Rates of incarceration have also increased for women offenders. For example, from 1981 to 2002 the rate of federal incarceration in Canada increased 27.2% for women (2.2 to 2.8 per 100,000) compared to only 14.5% for men (96 to 110 per 100,000) (Kong & AuCoin, 2008).

The apparent increase of women involved in the justice system has renewed the attention of researchers striving to understand female criminality. Examination into the increasing rates of female crime has led some researchers to conclude that recent changes in the policies and procedures implemented to deal with female offenders, such as 'zero tolerance' policies, could explain the apparent increase in female crime (Chesney-Lind & Paramore, 2001; Gaarder & Belknap, 2004; Steffensmeier, Zhong, Ackerman, Schwartz & Agha, 2006). For example, Steffensmeier, Schwartz, Zhong, and Ackerman (2005) reported that a major change in policies over the past few decades has been a move toward crime prevention, rather than reactive policing. As a result, less serious forms of crime, such as minor forms of aggression, may lead to arrests more often than in the past. Because females tend to engage in less serious forms of crime more often than serious forms of crime relative to males, a widening of the criteria for charges may inflate the

rate of arrests for females (Steffensmeier et al., 2005). However, several scholars continue to debate the reason behind the narrowing gender gap of crime.

Many researchers have studied the occurrence of criminal conduct. A dominant perspective derived from a group of scholars identified as the 'what works' proponents (e.g. Andrews, Bonta, & Hoge, 1990) has focused on particular principles for effective assessment and treatment of offenders (i.e., risk-need-responsivity principles). However, feminist scholars maintain that the 'what works' perspective was developed primarily for male offenders and ultimately fails to consider risk or need factors pertinent to female offenders (e.g. Belknap, 2007; Chesney-Lind & Sheldon, 2004). This includes the assessment tools derived from the 'what works' perspective, which are suggested to be incapable of accurately assessing the recidivism risk levels of female offenders. In response, gender-informed theories have been developed to illustrate the unique experiences or pathways leading women into crime. These theories have argued for the existence of several female-specific risk factors such as abuse, dysfunctional relationships, and economic disparity, which are considered fundamental contributors to female criminal behaviour (Daly, 1992; Heimer, 2000; Hunnicutt & Broidy, 2004).

Despite the existence of various theories of crime, it remains uncertain if gender-neutral risk factors (i.e., factors that are equally predictive of crime in both genders) sufficiently capture the aspects important to female crime, or if gender salient (i.e., factors that predict crime in both genders but the magnitude of the relationship is stronger in one gender versus the other) or gender-specific (i.e., factors that predict crime in one gender but not the other) risk factors may better explain female offending. The existing research examining the predictive capabilities of gender-neutral, gender-specific, and

gender-salient risk factors is filled with both strengths and limitations, making it difficult to advance theory or to determine the best approach to assess risk for female offenders. Thus, the present research serves to contribute to the ongoing debate of whether gender specific or salient risk factors, compared to gender neutral risk factors, improve the prediction of recidivism for male or female offenders.

To begin, a gender-neutral approach for assessing risk along with several popular risk assessment instruments will be reviewed. This will be followed by an examination of a gender-informed critique of the traditional risk assessment methods as well as a review of two female centered theories of crime. Finally, several key risk factors will be examined in terms of the predictive capability for recidivism for both male and female offenders.

What Works Paradigm: Gender Neutral Theory of Offending

A dominant theoretical perspective of criminal behaviour is the theory of general personality and social psychology (Andrews & Bonta, 2006). Grounded within this broad social learning perspective is the personal, interpersonal, community-reinforcement (PIC-R) model, developed to explain individual differences in criminal behaviour (Andrews, 1982). The PIC-R model asserts that criminal behaviour occurs as a function of the interaction of several important factors. This includes several macro-level variables such as political, cultural, and sociological aspects. However, the focus of the PIC-R model rests primarily on the individual-level factors such as behaviour and cognition.

Risk, need, and responsivity model. From the PIC-R model emerged the operational guidelines for effective correctional treatment, often referred to as the 'what works' perspective or the risk-need-responsivity (RNR) model (Andrews, Bonta, et al.,

1990). The RNR model consists of a set of principles based on the empirically derived factors found to contribute to criminal behaviour. The core principles of RNR consist of risk, need, and responsivity.

Risk principle. The principle of risk is comprised of two components: prediction and matching (Andrews, Bonta, et al., 1990). These components assert that an offender's level of risk for future criminal conduct can be predicted and that treatment to reduce recidivism should be matched to the identified level of risk (Andrews, Bonta, et al., 1990). In other words, a high risk offender should be matched with a high intensity treatment program to reduce the probability of recidivism. Alternatively, an offender identified as low risk should be provided with minimal treatment or even no treatment at all.

Need principle. The need principle highlights two types of offender needs: criminogenic and non-criminogenic needs (Andrews, Bonta, et al., 1990). Criminogenic needs are considered to be dynamic factors that if targeted during treatment will result in reducing the probability of recidivism. Non-criminogenic need factors, such as poor self-esteem or anxiety, may require attention during treatment but are not related to the probability of recidivism (Dowden, 1998).

Several studies have identified fundamental criminogenic need factors (e.g. Bonta, Law, & Hanson, 1998; Dowden & Andrews, 1999; Gendreau, Little, & Goggin, 1996; Lipsey & Derzon, 1998; Simourd & Andrews, 1994). These risk/need factors are commonly referred to as the "central eight" and consist of (1) history of antisocial behaviour, (2) antisocial personality pattern, (3) antisocial cognition, (4) antisocial associates, (5) family/marital factors, (6) school/work, (7) leisure/recreation, and (8)

substance abuse (Andrews & Bonta, 2006). The first four of these risk/need factors (antisocial behaviour, personality, cognition, and associates) have been labeled the "big four" as they are often found to be the factors most predictive of criminal behaviour (Andrews & Bonta, 2006).

Responsivity principle. Responsivity pertains to the aspects required for the effective delivery of treatment and is comprised of two types: general and specific (Andrews, Bonta, et al., 1990). General responsivity in treatment entails the use of cognitive-behavioural approaches which are delivered in a pro-social, warm, and caring manner (Andrews, Bonta, et al., 1990; Andrews & Kiessling, 1980; Andrews, Zinger et al., 1990; Dowden & Andrews, 2000). Specific responsivity addresses the individual characteristics of each offender that may impact treatment, such as learning style, cognitive ability, and motivation level (Andrews, Bonta, et al., 1990).

Several studies have demonstrated the effectiveness of adhering to the RNR model while providing treatment to reduce recidivism. A recent meta-analysis conducted by Andrews and Dowden (2006) evaluated the RNR principles in a sample of treated and non-treated offenders. From 225 studies generating 374 effect sizes, it was found that when offenders were matched to treatment based on their level of risk, reductions in recidivism were only significant when the need and responsivity principles were also followed. Specifically, there was no effect of treatment on the outcome of recidivism for low or high risk offenders when the applied treatment program did not target criminogenic needs or responsivity factors. However, when the treatment program followed the need and responsivity principles, there was a small effect of treatment for

low-risk offenders (*mean r* = .11) and a significantly higher effect for high-risk offenders (*mean r* = .22).

Evolution of risk assessment. The history of risk assessment has been described as consisting of four generations of classification systems (Andrews, Bonta, & Wormith, 2006; Bonta & Andrews, 2007). The first generation of risk assessment instruments required professionals to make a judgment regarding an offender's level of risk solely based on their own clinical experience and training (Bonta & Andrews, 2007). A variation of this approach later emerged, allowing clinicians to use an assessment measure to assist in structuring their professional judgment (Andrews et al., 2006).

The second generation of risk assessment instruments moved away from professional judgment and relied more heavily on empirically-based assessment measures utilizing an actuarial approach (Andrews et al., 2006; Bonta & Andrews, 2007). An actuarial risk assessment measure allows for the identification and summation of risk items, resulting in a composite score to assist in the determination of a risk classification level. However, a major limitation of these measures is the primary focus on historical factors (Bonta & Andrews, 2007). Historical or static factors, such as prior criminal history or drug abuse history, are unalterable and cannot provide information regarding changes in risk level as a result of treatment.

Third generation risk assessment instruments addressed the limitations of second generation assessment tools by including both theoretically based static and dynamic risk factors (Andrews, et al., 2006). Dynamic risk factors, also referred to as criminogenic needs, are modifiable factors which if targeted during treatment should result in reductions in an offender's probability for recidivism (Andrews & Bonta, 2006;

Andrews, Bonta, et al., 1990; Bonta & Andrews, 2007). For example, employment, family relationships, and peer relationships are all considered dynamic factors.

Fourth generation assessment tools go beyond the assessment of risk and need as they also identify case management factors (Andrews & Bonta, 2006). In other words, fourth generation instruments guide each area of assessment, treatment, supervision, and service delivery from the time an offender enters the correctional system until the end (Andrews et al., 2006). A key component of the fourth generation assessment tools is a reliance on the risk-need-responsivity model for effective correctional treatment (Andrews & Bonta, 2006).

Risk assessment instruments: Predictive validity. Several risk assessment tools from each generation of instruments have been developed to evaluate various forms of recidivism. A first generation assessment device, the Spousal Assault Risk Assessment Guide (SARA; Kropp, Hart, Webster, & Eaves, 1995), consists of 20 risk items to determine the level of risk for domestic violence through structured professional judgment. The predictive validity of the SARA has been identified as low (AUC =.52 to .65, 95% CI = .41 to .77), which is typical for first generation assessment methods (Grann & Wedin, 2002).

The predictive accuracy of risk tools appeared to improve with the introduction of actuarial measures in the second generation assessment instruments. The Psychopathy Checklist-Revised (PCL-R; Hare, 2003), a 20 item assessment of psychopathy and a predictor of violent recidivism (Hare, Clark, Grann, & Thronton, 2000), along with the Violence Risk Appraisal Guide (VRAG; Harris, Rice & Quinsey, 1993), a 12 item evaluation of the probability of violent recidivism, have been found to be valid

assessment tools. Grann and Wedin (2002) identified AUC coefficients of .71 and .75 for the PCL-R and VRAG respectively, demonstrating good predictive accuracy for these second generation assessment instruments.

A recent meta-analysis was conducted to explore the predictive accuracy of second, third and fourth generation assessment tools (Campbell, French, & Gendreau, 2009). This study included the second generation PCL-R, VRAG, and the Statistical Information on Recidivism scale (SIR; Nuffield, 1982), a 15-item scale exploring historical factors (e.g. previous convictions). The third generation assessment measures included the Level of Service Inventory-Revised (LSI-R; Andrews & Bonta, 1995), a general recidivism assessment tool comprised of 54 risk/need items based on the "central eight" criminogenic risk/need factors, as well as the Historical, Clinical, and Risk Management-20 (HCR-20; Webster, Douglas, Eaves, & Hart, 1997), a violence risk assessment tool comprised of 20 items. The fourth generation assessment instrument examined was the Level of Service/Case Management Inventory (LS/CMI; Andrews, Bonta, & Wormith, 2004), a tool based on the RNR model which serves to inform treatment to reduce recidivism.

The meta-analysis was based on 88 studies of predominantly male offenders, yielding 185 effect sizes for violent recidivism (Campbell et al., 2009). A comparison of each generation of risk instruments revealed that fourth generation instruments demonstrated the largest predictive estimate of violent recidivism ($Zr = .52$), followed by the third generation ($Zr = .23$), and then second and first generation assessment methods ($Zr = .18$). Although there were few effect sizes available for the analysis of the first and fourth generation assessment instruments, similar findings have been obtained in other

studies to support these results. Andrews et al. (2006) reviewed several existing meta-analyses and also found the highest mean predictive validity estimates for fourth generation risk assessment instruments for both general and violent recidivism (*mean r* = .41, *mean r* = .29), followed by third (*mean r* = .36, *mean r* = .25) and second generation tools (*mean r* = .26 to .42, *mean r* = .27 to .39), and finally first generation assessment methods (*mean r* = .10, *mean r* = .13). Overall, the predictive accuracy of risk assessment tools appears to have increased with each generation of instruments.

The Dynamic Factors Identification and Analysis Assessment Measure

The Dynamic Factors Identification and Analysis (DFIA) instrument is another risk assessment tool that will be used in the present study. The DFIA is a component of the Offender Intake Assessment (OIA) process, which is a national assessment model developed in the early 1990s for the Canadian federal correctional system[1] (Motiuk, 1997). The DFIA is a standard assessment tool used to identify the dynamic need factors associated with each offender's criminal behaviour in order to develop an effective correctional treatment plan.

Although the DFIA is based on structured professional judgment, it is considered a third-generation assessment tool because it is centered on the evaluation of dynamic risk factors. The DFIA is comprised of seven dynamic factors including employment, marital/family, associates/social interaction, substance abuse, community functioning, personal/emotional orientation, and attitude (Brown & Motiuk, 2005). These factors are prominent in the RNR literature and can be recognized as several of the "central eight" risk/need factors. Each dynamic factor domain of the DFIA is broken-down into principal

[1] Federal incarceration is defined as a sentence term of two years or more (Correctional Service Canada, 2007) whereas Provincial incarceration is defined as a sentence term less than two years (Ministry of Community Safety & Correctional Services, 2010).

components, which are then broken-down further into subcomponents, and then comprised of several indicators (see Appendix A). The seven domains consist of 35 principal components, 94 subcomponents, and 197 indicators. The indicators serve as yes/no questions to guide the evaluator while conducting the DFIA.

The DFIA is conducted by parole officers based on a collection of information including police reports, court related documents, self-reports, interviews, and direct observation (Motiuk, 1997). Two of the dynamic factor domains, substance abuse and personal/emotional, are measured on a three-point scale ranging from 'no need for improvement' to 'considerable need for improvement' (Brown & Motiuk, 2005). The remaining domains are measured on a four-point scale consisting of 'factor seen as an asset to community adjustment' to 'considerable need for improvement'. Based on the integration of the collected information and guided by the indicators within each subcomponent, a rating for each domain is generated. The domain ratings are then considered collectively along with additional mental/physical health needs. From this, structured professional judgment is used to determine a total dynamic intervention rating. The overall dynamic intervention ratings range from low, medium, to high and serve to inform correctional treatment plans.

Predictive validity of the DFIA. Empirical support has been offered for the predictive capability of the DFIA. Motiuk (1998) examined a sample of 3380 male offenders to assess the predictive validity of the DFIA. Correlational analyses revealed significant associations between each dynamic need domain and a subsequent return to prison (r = .09 to .17). A significant relationship was also identified between a composite measure of the indicators within each domain and a return to prison (r = .11 to .19). Step-

wise regression revealed the strongest predictor of recidivism for the sample of male offenders was the employment domain, followed by substance abuse, associates, marital/family, and personal/emotional. Overall, it was identified that the DFIA component of the OIA is predictive of recidivism and may be used to identify offender needs in order to inform treatment.

Similar findings were also obtained for the DFIA in a sample of both male (n = 15479) and female (n = 765) offenders (Brown & Motiuk, 2005). Moderate to strong correlations were found between several of the DFIA indicators and readmission to federal custody during a three year follow-up period. Additionally, regression analysis revealed that several of the indicators were uniquely predictive of recidivism for male and female offenders.

Gender Informed Critique of the 'What Works' Paradigm

Support for the RNR model and various risk/need assessment measures has been demonstrated for both male and female offenders (Andrews & Dowden, 2006; Dowden & Andrews, 1999; Lovins, Lowenkamp, Latessa, & Smith, 2007; Lowenkamp, Holsinger, & Latessa, 2001; Smith, Cullen, & Latessa, 2009). However, some feminist scholars, or gender-responsive proponents, have questioned the validity of these assessment tools with female offenders. This uncertainty has stemmed from three key issues regarding the development and use of risk/need assessment tools. These concerns include male-centered risk/need factors, methodological limitations, and misclassification of female offenders.

Male-centered risk/need factors. Gender-responsive proponents hold that the RNR model does not apply equally to female offenders as it was developed by men and

validated primarily on male offenders (Belknap, 2007; Bloom, Owen, & Covington, 2005; Bloom, Owen, Deschenes, & Rosenbaum, 2002; Chesney-Lind & Sheldon, 2004; Foley, 2008; Moffitt, Caspi, Rutter, & Silva, 2001). In fact, women were generally excluded from research investigating criminal offending until the late 1970's (Belknap, 2007). Although research on the criminal risk factors for female crime has rapidly expanded within the last 20 years, the magnitude pales in comparison with the amount of literature based on male offenders (Belknap, 2007; Blanchette & Brown, 2006; Salisbury & Van Voorhis, 2009). Additionally, when research does explore female offenders, the principal focus appears to remain on fitting women into the pre-existing male centered risk-need-responsivity model (Belknap, 2007).

Some scholars maintain that the RNR model generally fails to address the experiences or macro-level factors proposed to be unique to female offending behaviour (Hubbard & Matthews, 2008). Specifically, women in conflict with the law often come from dysfunctional or abusive relationships (Chesney-Lind & Shelden, 2004; Daly, 1992). Women who escape these situations often go on to experience high rates of poverty, increased prevalence of mental health issues, and problems with addictions to drugs and alcohol (Bloom et al., 2005; Belknap & Holsinger, 2006). The strategies used by these women to survive (e.g., prostitution, theft, substance abuse) are often criminalized, leading to an involvement with the justice system (Belknap & Holsinger, 2006; Daly, 1992). Even without abuse as a precursor to life on the streets and poverty, many women experience economic disparity as divorced, single parents, with low paying jobs, which is posited to be associated with criminal behaviour as a means to survive (Holtfreter, Reisig, & Morash, 2004; Hunnicutt & Broidy, 2004). Thus, gender-

responsive proponents maintain that the RNR based assessment tools do not capture the specificity of women's offending patterns as pertinent female risk factors are not considered.

Absence of mixed gender samples. In order to establish if a risk factor is particularly important for one gender over the other, a direct comparison of men and women is required (e.g., Benda, 2005; Brown & Motiuk, 2008). However, much of the research conducted by the 'what works' and the gender-responsive proponents have failed to adequately examine gender differences. Rather than directly comparing gender, many studies examine only one gender without comparing the other, or include small or unrepresentative gender comparison groups, or merely control for gender through statistical methods (Belknap, 2007; Blanchette & Brown, 2006; Holtfreter & Cupp, 2007). Without adequate male and female comparison groups, concrete conclusions cannot be drawn regarding the predictive capabilities of risk factors for one gender versus the other.

Misclassification. Although the 'what works' proponents maintain the RNR-based risk assessment tools (e.g. LSI-R) are valid for both male and female offenders, feminist scholars maintain that these male-based tools incorrectly assess women (Belknap, 2007; Bloom et al., 2005; Bloom et al., 2002; Chesney-Lind & Sheldon, 2004; Foley, 2008; Reisig, Holtfreter, & Morash, 2006). In particular, women are often found to be over-classified by traditional risk assessment systems (Van Voorhis & Presser, 2001), which have been attributed to two key reasons. Female offenders classified as high-risk are considered to be different from high-risk male offenders as they are 1) less likely to re-offend compared to high-risk male offenders and 2) much less likely to re-offend

violently compared to male offenders (Blanchette & Brown, 2006; Farr, 2000; Serin et al., 2010). In particular, one study has reported that the LSI-R both under- and over-classified female offenders, meaning that their level of risk was rated as either lower or higher than the actual threat their behaviour posed (Reisig et al., 2006). Incorrectly identifying the level of risk may result in treatment which is inconsistent with effective correctional principles and practices.

Female Centered Theories of Crime

As it has been suggested that women engage in crime differently than men (Belknap, 2007; Chesney-Lind & Shelden, 2004; Steffensmeier & Allan, 1996), female specific theories have been developed to explain the etiology of female crime. Several gender informed theories presently exist; however, two will serve as the focus in the present study. The feminist pathways theory and the liberation and economic marginalization theory both highlight particular factors thought to be pertinent to female crime.

Feminist pathways theory. The feminist pathways framework (Daly, 1992) was devised to explain the multiple pathways leading women into a life of crime. The central aspect of this theory is the coping strategies used by women in adverse life situations. Essentially, the coping strategies necessary for self-preservation may result in illegal behaviour and subsequent criminal charges (Belknap & Holsinger, 2006; Daly, 1992). In general, most of the female specific pathways to crime stem from the adverse life experience of abuse or maltreatment.

Using qualitative and descriptive analyses, Daly (1992) identified five primary pathways that lead women into a life of crime:

1) Street Women: Girls abscond from abusive homes, drop out of school, and then turn to minor crimes, prostitution, and drug use to survive a life on the streets.

2) Harmed-and-Harming: As a result of a chaotic childhood characterized by abuse and neglect, women experience mental health issues leading to an inability to cope, difficulty with substance use, and aggressive or violent behaviour.

3) Battered Women: Women in an abusive relationship become involved in the justice system only after retaliating against their violent partner, or following a violent act of self-defence.

4) Drug-Connected: Women become involved in drug trafficking as a result of the influence from an intimate partner or family.

5) Other: With no experience of abuse or involvement in drug use, these women commit crimes usually characterized as economically motivated.

Several meta-analyses have identified abuse to be a particularly important factor in female offending. Hubbard and Pratt (2002) examined 97 effect size estimates for delinquency from samples of female young offenders and identified a significant mean effect of physical or sexual abuse (*mean r* = .21). Similarly, meta-analytic results from some of the RNR proponents have identified family factors (*phi* = .51 - .62) to be among the strongest predictors of recidivism for female offenders (Dowden & Andrews, 1999). Green (2006) examined nine prospective studies comparing both males and females and identified a larger mean effect of abuse with regard to delinquency for girls (*Mr* = .22, *CI* = .11 - .33) compared to boys (*M*r = .08, *CI* = .01 - .15); however, the 95% confidence intervals for males and females were found to overlap. Despite this, there appears to be

evidence for the importance of abuse and the quality of family relationships with respect to criminal behaviour for female offenders.

Support for Daly's (1992) proposed link between abuse and female crime was also provided by McCormack, Janus, and Burgess (1986) who examined a sample of 55 female and 89 male adolescents in Canada. Similar to what has been found in past research (e.g. Chesney-Lind & Shelden, 2004; Department of Justice Canada, 2008; Finkelhor, 1994), females significantly reported more experiences of past sexual abuse (73%) compared to males (38%). Additionally, compared to girls who ran away but were not sexually abused, girls who were sexually abused and ran away from home were significantly more likely to engage in criminal behaviour (44% vs. 0%) or to be arrested (43% vs. 0%). When males were examined, no significant difference was found with regard to the criminal behaviour between boys who were sexually abused and boys who were not. Thus, the differences in offending behaviour between males and females could be explained by the female specific pathways into crime.

Liberation and economic marginalization theory. Another theory developed to explain female criminality is the liberation and economic marginalization theory (Hunnicutt & Broidy, 2004). This theory posits that although changes in social norms and gender roles brought about by the women's liberation movement have resulted in more opportunities for women, it has also resulted in a worsening of women's economic situation. Women are increasingly expected to be independent, but are often not in a position to be economically self-sufficient. Hunnicutt and Broidy (2004) explain that women are commonly found to be divorced, managing a household as a single parent, and working in low paying jobs. Further to this, Hunnicutt and Broidy (2004) maintain

that to meet the societal expectation to be successful and self-sufficient, women may resort to criminal acts (e.g. theft, fraud, embezzlement) as a means to succeed and survive.

The validity of the liberation and economic marginalization theory was formally tested as Hunnicutt and Broidy (2004) examined 10 different countries to explore female and male economic and social positions (i.e., salaries, divorce rates, and unemployment rates). A time series analysis was employed to examine the relationship between economic variables and conviction rates over a 20 year time-period from 1975 to 1994. As would be expected, the conviction rate for males was consistently higher than females in each of the countries examined. Further, differences in crime based on gender were found as a result of social and economic conditions. The rate of convictions for females was significantly impacted by general government consumption, divorce rates, ratio of dependents, and employment in industrial and service sectors. For males, the only factor significantly associated with conviction rates was divorce. This demonstrates that most of the indicators of economic marginalization predictive of female crime were not associated with male crime. These findings provide support for the liberation and economic marginalization theory of crime. However, additional research is necessary to examine other individual level factors as not all unemployed or divorced women engage in crime.

Risk Factors for Criminal Offending

Proposed gender neutral risk factors.

History of antisocial behaviour. Several risk factors are known to be associated with criminal recidivism, many of which are presumed to predict recidivism equally for

male and female offenders. For instance, criminal history, which is a static and unchanging risk factor encompassing an early and continued involvement in criminal behaviour (Andrews & Bonta, 2006), has long been established as a risk factor for recidivism in male offender samples. A meta-analysis consisting of 131 studies with a sample of 123,940 predominantly male offenders revealed a moderate association (*mean* $r = .18$) between criminal history (i.e., prior arrest, probation, jail, convictions, or incarceration) and recidivism (Gendreau et al., 1996).

Interestingly, there has been less research into the predictive capability of the criminal history risk factor for female offenders. For instance, the Statistical Information on Recidivism scale (SIR; Nuffield, 1982), used to evaluate risk based on static criminal history variables (e.g., previous incarceration), remained validated only for male offenders for many years following its development (Bonta, Pang, Wallace-Capretta, 1995). However, as will be demonstrated shortly, a growing number of studies examining the predictive capability of the criminal history risk factor for female offenders have emerged.

Although there have been mixed reports on the predictive validity of criminal history for females (e.g. Bonta et al., 1995), some promising findings have been attained. An adapted version of the SIR scale (SIR-Proxy) was found to demonstrate good predictive accuracy for general recidivism ($AUC = .77$) as well as violent recidivism ($AUC = .73$) in a sample of 342 female federal offenders (Nafekh & Motiuk, 2002). Correspondingly, moderate to strong associations ($r = .12$ to $.32$) were found between criminal history, as defined by the LSI-R, and recidivism for community samples ($n = 668$) as well as incarcerated samples of female offenders ($n = 626$; $n = 406$) (Van Voorhis

et al., 2010). Thus, support has been offered for criminal history as a significant predictor of recidivism in both male and female offender samples.

Antisocial attitudes. Antisocial attitude, defined as attitudes, values, and beliefs that are supportive of crime and often accompanied by anger and defiance (Andrews & Bonta, 2006), is an important dynamic risk factor for male crime. For example, negativity toward the law, supportiveness of violence, and non-conforming attitudes were found to be significantly associated with recidivism (r = .12 to .17) in a meta-analysis consisting of predominantly male offenders (Law, 1998). And although the majority of studies examining antisocial attitudes have focused on men, research is beginning to accrue for women.

Some feminist scholars assert that a focus on antisocial attitudes or cognitions diminishes the macro-level factors (e.g., economic marginalization) believed to be important to female offenders (Kendall, 2002). However, support has been offered for antisocial attitudes as an important factor for female criminal behaviour. Studies examining female offenders have often operationalized antisocial attitude through the construct offered by the 'what works' perspective. As measured by the LSI-R, antisocial attitudes were found to significantly predict recidivism for female offenders in the studies by Rettinger and Andrews (2010) (r = .45 to .52) and Van Voorhis et al. (2010) (r = .11 to .22). Similarly, Simourd and Andrews (1994) found parallel results in their meta-analysis with both male (*mean* r = .40) and female (*mean* r = .39) youth. However, Simourd and Andrews (1994) included both cross-sectional and longitudinal research designs and also collapsed antisocial associates and attitudes into one factor, making it difficult to discern the specific influence of attitudes in their study. Regardless, the

research demonstrates antisocial attitudes to be an important factor in both male and female adult and youth offending.

Anti-social attitudes have also been explored through the DFIA. Brown and Motiuk (2005) identified significant point bi-serial correlations between several indicators in the attitude domain and readmission to custody in a sample of male (n = 15,479) and female (n = 765) federal offenders. Building on this, Brown and Motiuk (2008) directly tested the effect of gender on the predictive capability of the DFIA indicators through the use of odds ratios, which are argued to be the most appropriate method for evaluating two sets of dichotomous variables (e.g., risk present/absent, recidivist/non-recidivist) (Haddock, Rindskopf, & Shadish, 1998). An odds ratio may be defined as the odds of recidivism calculated by dividing the probability of recidivism by the probability of non-recidivism (Hanson, 2008). Brown and Motiuk (2008) found that from 24 attitude indicators, only one attitude indicator (marital/family holds no value) predicted recidivism solely for females and not for males (female specific). Additionally, two attitude indicators (negative towards law, lacks direction) predicted recidivism for both genders but more strongly for females (female salient). Although no attitude indicators were found to predict recidivism solely for males (male specific), four indicators (e.g., negative toward police and courts) were found to predict recidivism for both genders but more strongly for male offenders (male salient). Thus, support was found for some of the DFIA attitude domain indicators to be important predictors of recidivism for both male and female offenders.

Antisocial personality. Although often assessed using the LSI-R or its' successors, antisocial personality has been measured in a variety of ways. For instance,

the PCL-R is comprised of two factors, one pertaining to interpersonal and affective features central to psychopathy (e.g., lack of remorse or guilt), and another focusing on the features of antisocial behaviour (e.g., impulsivity) (Hare, Hart, & Harpur, 1991). A recent meta-analysis using the PCL-R to examine recidivism found significant effects for the total PCL-R score (*mean weighted d* = .55), Factor 1 score (*mean weighted d* = .38), and Factor 2 score (*mean weighted d* = .60) for both male and female samples (Leistico, Salekin, DeCoster, & Rogers, 2008). Additionally, Factor 2 of the PCL-R (features of antisocial behaviour) significantly demonstrated the largest association with recidivism. When examining female offenders only, the PCL-R has also been found to significantly predict recidivism (Richards, Casey, & Lucente, 2003). Interestingly, in their sample of 239 women, Richards et al. (2003) found Factor 1 to strongly predict recidivism for female offenders, which differs from what is typically found in male samples with Factor 2 as the stronger predictor of recidivism.

Studies examining anti-social personality have typically focused on male offender samples and have found that antisocial personality is an important factor for male offending behaviour (r = .18) (Gendreau et al., 1996). However, research with females has grown. Significant findings for antisocial personality, as measured by the LSI-R, have been attained for female offenders for both general recidivism (r = .49) and violent recidivism (r = .44) (Rettinger & Andrews, 2010). Overall, predictive support has uncovered antisocial personality as an important risk factor for both male and female offenders.

Despite these favorable findings, few studies have directly compared gender or employed more sensitive tests to assess the predictive validity of antisocial personality

factors for male and female offenders. To address this, Brown and Motiuk (2008) utilized odds ratios to examine the 46 indicators within the personal/emotional DFIA domain. A few indicators representative of antisocial personality were found to demonstrate saliency or specificity with small to moderate effects for female offending behaviour (e.g., poor problem solving, aggressive). Interestingly, there were no salient predictors for men, but five specific factors demonstrating a small to moderate effect for male offending behaviour (e.g., impulsive, poor conflict resolution). Overall, although antisocial personality is important for both male and female crime, this one study suggests that more factors related to antisocial personality may be specific to the offending behaviour of men.

Antisocial associates. Defined by an association with primarily criminal friends or few or no pro-social friends (Andrews & Bonta, 2006), antisocial associates has long been considered an important factor in male offending behaviour (Andrews, 1980; Sutherland, 1947). Meta-analytic findings have revealed a significant mean effect (*mean* $r = .18$) for antisocial associates and recidivism in a large sample of male offenders ($n =$ 11,962) (Gendreau et al., 1996).

Antisocial associates is a significant risk factor for female offenders as well. In their meta-analysis, Dowden and Andrews (1999) examined 26 distinct studies and identified a significant association between antisocial associates and recidivism (*mean phi* = .35) for female offenders. Similarly, Van Voorhis et al. (2010) also found associates to be an important factor for recidivism for women in the justice system across several states in America ($r = .13$ to .23). Interestingly, although the magnitudes were large, Rettinger and Andrews (2010) did not find a significant correlation between criminal

companions and general recidivism (r = .43) or violent recidivism (r = .28) for female offenders. However, through regression analysis, Rettinger and Andrews (2010) did find that antisocial companions contributed to an overall model (*Multiple R* = .61) explaining the greatest proportion of variance in general recidivism.

Brown and Motiuk (2008) compared a large sample of male and female federal offenders on the 11 indicators of the DFIA associates domain through the use of odds ratios. Interestingly, although there were a few indicators found to be equally predictive of recidivism for both male and female offenders (e.g., associates with substance abusers), none of the indicators were found to specifically predict recidivism for either male or female offenders. Furthermore, none of the indicators were found to be salient predictors for male offenders either. The only significant effects based on gender were a few indicators found to be salient predictors for women (e.g. has many criminal friends, criminogenic neighbourhood). Thus, a more comprehensive analysis revealed that antisocial associates may be a more important risk factor for female offending than previously thought.

Education/employment. Education or employment are known to be important factors for recidivism in male offender samples (Gendreau et al., 1996). However, education or employment are also proposed to be salient risk factors for female offenders, at least theoretically. Pathways theorists have maintained that the circumstances leading women into crime typically result in dropping out of school, thus limiting their employability (Daly, 1992). Through research examining prevalence rates, feminist scholars maintain that education and employment influence female rates of crime more so than for males (Bloom et al., 2003). Specifically, estimates of a 60% unemployment rate

for women upon entering prison have been identified compared to a 40% unemployment rate for men (Greenfeld & Snell, 1999).

However, empirical results have not consistently reflected the theoretical supposition that education or employment is particularly important for women. A direct comparison of male (n = 1025) and female (n = 373) offenders on the LSI-R education/employment domain revealed no difference in risk score (Heilbrun et al., 2008). Additionally, Dowden and Andrews (1999) found a small and non-significant negative correlation (-.08) between education/employment and recidivism for female offenders. However, other studies based on the LSI-R have identified significant associations between education/employment and recidivism in samples of female offenders in the justice system across several states in America (r = .11 to .27) (Van Voorhis et al., 2010). Additionally, Brown and Motiuk (2005) identified several significant, albeit small correlations between the DFIA employment domain indicators and recidivism for both male and female offenders. Clearly, a more rigorous statistical comparison of male and female offenders is needed to identify the influence of education or employment.

Using odds ratios, Brown and Motiuk (2008) provided some support to the theory that education/employment is particularly important for women. Of the 35 employment indicators from the DFIA, odds ratios revealed two indicators (unemployed 90% of time, unemployed 50% of time) predicted recidivism equally for male and female federal offenders. Interestingly, there were no indicators found to be specific for men and only two indicators predicting recidivism more saliently for men (e.g., no employment history). Conversely, eight indicators were found to predict recidivism specifically (e.g.,

less than grade 10, dissatisfied with trade) and three predicted more saliently (e.g., no skill/trade/profession) for female offenders. These findings suggest employment to be a particularly important factor to women; however, more research directly comparing male and female offenders is needed to substantiate these results.

Leisure/recreation. Meta-analytic findings have revealed that leisure is an important risk factor for recidivism for male offenders. Gates, Dowden and Brown (1998) examined leisure measured by the community functioning domain the DFIA in a predominantly male offender sample. Of all the predictor categories examined, leisure produced the largest weighted Pearson correlation coefficient (Mz = .24), demonstrating strong support for leisure as a significant predictor of recidivism.

Conversely, recent studies have found inconsistent results for leisure with female offenders. Measured through the LSI-R, moderately negative to low positive associations (r = -.19 to .13) have been found for leisure and recidivism in female offender populations (Van Voorhis et al., 2010). Similarly, Rettinger and Andrews (2010) found the LSI-R leisure/recreation factor was not significantly associated with general recidivism (r = .30), but was significantly associated with violent recidivism (r =.27) for female offenders. However, these findings are not surprising as the leisure/recreation factor measured by the LSI-R is comprised of only two items (e.g., no participation in organized activity, could make better use of time).

The community functioning domain of the DFIA consists of 21 indicators and was recently explored with both male and female offenders. A few of the indicators within the community functioning domain correspond to the items found in the LSI-R leisure factor (e.g., does not participate in organized activities). Brown and Motiuk

(2005) found several of the community functioning indicators to be significant but weakly correlated with recidivism for both male and female offenders. Additionally, when gender differences were examined through odds ratios, Brown and Motiuk (2008) found only one female specific indicator (no credit) and none that predicted recidivism more saliently for females. For men, two indicators predicted recidivism specifically (no hobbies, social assistance) and one predicted recidivism more saliently (unstable accommodations) for male offenders. Overall, although community functioning or leisure may be associated with recidivism for male and female offenders, it does not appear to be a particularly important factor in female crime.

Proposed gender responsive risk factors. Many feminist scholars maintain that there are risk factors specific to female offending behaviour. Yet, the RNR proponents assert the 'central eight' is gender neutral and contains the risk factors most predictive of recidivism for both males and females. In order to identify if risk factors are similar or different for men and women, the predictive validity of the risk factors must be examined for each gender. As defined by Brown and Motiuk (2008), gender neutral risk factors are variables which are equally predictive of recidivism in both male and female offender samples. Gender salient risk factors are variables predictive of recidivism for both males and females; however, the magnitude of the relationship is significantly stronger for one gender. And lastly, gender specific risk factors are those which significantly predict recidivism for one gender, but not at all for the other.

As some have indicated, the difficulty in determining whether risk factors are gender neutral, salient, or specific lies in the fact that most of the research driving the female specific theories of crime is derived almost exclusively from prevalence research

or qualitative designs (e.g., Blanchette & Brown, 2006; Bloom et al., 2005; Bloom et al., 2003; Chesney-Lind & Shelden, 2004). Notable exceptions aside (e.g., Brown & Motiuk, 2008), very few studies have employed rigorous statistical methods to examine the predictive validity of the proposed risk factors for female offenders. Additionally, even fewer studies have done so while comparing adequate male and female comparison groups, a necessary requirement to establish the differential impact of a risk factor based on gender. Thus, our understanding of gender saliency or specificity is rather incomplete, but growing with an increasing interest in gender informed risk factors.

Dysfunctional relationships. The literature examining male offenders has long held that family and relationships greatly influence the occurrence of criminal behaviour (Andrews & Bonta, 2006; Glueck & Glueck, 1950; Loeber & Dishion, 1983). However, feminist scholars express that interpersonal relationships are particularly important to women and may be a salient risk factor for female offenders. For instance, relational cultural theory posits that women strive to maintain relationships and connectedness (Miller & Stiver, 1997), even at the potential cost of committing criminal acts (Jenkins, 2004).

Meta-analytic findings have revealed family relationships to be an important risk factor for both male and female offenders. Gendreau et al. (1996) identified a significant association between family factors and recidivism (*mean* $r = .12$) for male offenders. Additionally, Dowden and Andrews (1999) found family affection (*phi* = .51) and family structure (*phi* = .62) to be among the strongest predictors of recidivism for female offenders. However, these meta-analyses did not examine the effect of gender and how relationships differentially impact the offending behaviour of men and women.

To address this limitation, a few studies have directly compared male and female offenders and found that family factors may be particularly important for female recidivism. In a young offender sample, significantly higher rates of recidivism were found for girls (*Mean OR* = 2.4) compared to the boys in the study (*Mean OR* = 1.9) and their brothers (*Mean* OR = 1.5) with regard to several family risk factors (Farrington & Painter, 2004). Similarly, odds ratios were examined in adult offender samples by Brown and Motiuk (2008) to explore the 31 DFIA indicators in the family/marital domain. Four indicators were found to predict recidivism equally for males and females (e.g., dysfunctional parents) and no significant gender salient factors were identified. Interestingly, only one indicator demonstrated a small effect specifically for male offenders (spousal abuse perpetrator), whereas four indicators were found to be specific predictors for female offenders (e.g., poor relations with father, parenting problems). Although these findings suggest relationship factors are important to both genders, they may be more salient for females. Additional research employing more sensitive measures to evaluate the predictive accuracy of relationship factors is needed.

Substance abuse. Substance abuse is considered a risk factor when alcohol or drug use contributes to the occurrence of criminal behaviour (Andrews & Bonta, 2006). As with many other risk factors, the literature has established substance abuse as a key risk factor for male offenders. However, many feminist scholars, particularly pathway theorists, have maintained that substance abuse is a central factor in female offending (Belknap, 2007; Daly, 1992; Chesney-Lind & Shelden, 2004).

Compared to other risk variables, more research has examined the differences between male and female offenders with regard to substance use and recidivism. Dowden

and Brown (2002) conducted a meta-analysis consisting of 45 studies, of which, 80% of the sample was male and 20% was female. Several of the LSI-R based risk items for substance abuse were significantly different between males and females; however, overlapping confidence intervals were identified for all but one. The weighted mean effect for 'substance abusing parent' was significantly larger for females ($Mz+ = .20$) than for males ($Mz+ = .09$). This finding could lend some support to the pathways perspective that negative family environments could contribute more significantly to female offending behaviour.

Other findings have also supported the notion of the importance of substance abuse for women. McClellan, Farabee, and Crouch (1997) examined 1030 male and 500 female offenders and found that the risk factor of substance use accounted for more of the variance in property crime for female offenders ($R^2 = .13$) compared to the variance explained for male offenders ($R^2 = .08$). Additionally, Brown and Motiuk (2008) found that of the 29 indicators in the DFIA substance abuse domain, five indicators predicted recidivism specifically for females (e.g., combines alcohol/drugs) and five indicators predicted specifically for males (e.g., early drinking age). However, two indicators predicted more saliently for women (e.g., drug use interferes with marital/family) whereas none were found to predict more saliently for males. Adding to this, a recent study examining 342 female and 2069 male offenders from five pre-existing datasets revealed that although substance abuse was predictive for both males (*mean AUC* = .61) and females (*mean AUC* = .77), substance abuse was significantly more predictive of recidivism for female offenders (Andrews et al., unpublished manuscript). Overall, the

findings from several studies have identified substance use to be a gender salient predictor of recidivism for female offenders.

Mental health. Although mental health issues impact both men and women, the type of mental illness experienced is found to vary by gender (Bloom et al., 2003; Salisbury, Van Voorhis, & Spiropoulos, 2009). Women more often experience depression and anxiety where as men are more likely to be diagnosed with substance abuse and antisocial personality disorder (Bloom et al., 2003). Interestingly, the perspective held by the 'what works' and feminist scholars regarding the influence of mental health on criminal offending has differed.

'What works' proponents have generally maintained mental health to be a specific responsivity factor which is not directly associated with recidivism (Andrews, Bonta, et al., 1990; Bonta & Andrews, 2007). In samples of predominantly male offenders, psychiatric symptomatology was not found to be associated with recidivism ($r = .00$) (Gendreau et al., 1996). Furthermore, mental health issues such as mood disorders, psychosis, and treatment history, have been found to be non-significant ($Zr = -.05$ to $.01$), or significant but negatively associated ($Zr = -.04$ to $-.07$) with both general and violent recidivism (Bonta et al., 1998). Only a diagnosis of antisocial personality disorder was found to be a significant mental health predictor for general ($Zr = .15$) and violent ($Zr = .18$) recidivism (Bonta et al., 1998). Even in samples of female offenders, Dowden and Andrews (1999) did not find a significant effect of treatment for recidivism when vague emotional or personal problems were targeted (*Mean phi* = .15, $p > .05$).

Despite these findings, feminist scholars maintain that mental health issues are a key factor in female offending behaviour (Holtfreter & Morash, 2003; Salisbury & Van

Voorhis, 2009). It is argued that the traditional method for assessing risk based on mental health is to identify or diagnose major mental illness (i.e. psychosis, mood disorders) (Salisbury et al., 2009). However, a better measure may be the indicators of mental health issues rather than a diagnosed mental illness. This is because the overall construct of mental illness may mask the presence of any minor indicators which may not be sufficient on their own for a complete diagnosis.

When looking at indicators rather than diagnoses, significant findings have been obtained for mental health issues and recidivism for female offenders. A history of mental health symptoms, anxiety/depression symptoms, and symptoms of psychosis were found to be significantly correlated with recidivism (r = .13 to .26) in samples of female offenders on probation and in prison (Van Voorhis et al., 2010). However, a negative association (r = -.20) was identified for a history of mental health symptoms and technical violations for a pre-release sample. Overall, symptoms of mental health issues appear to be important factors of recidivism for female offenders.

In a study of boot camp graduates, when the influence of mental health was directly compared between male and female offenders, mental health issues were found to be more important for recidivism for women (Benda, 2005). Cox's proportional hazards models identified stress and depression to be among some of the strongest predictors of recidivism for female offenders with a hazard ratio (similar to odds ratios in logistic regression) of 2.10 and 1.80 respectively. For male offenders, a significant association was only identified between recidivism and stress with a much smaller hazard ratio (1.40) compared to the female sample. Although support was found for mental health as a female salient risk factor, there were limitations within the study by Benda

(2005). First, mental health issues more common to men were not examined, thus limiting the ability to claim mental health as a female salient risk factor. Additionally, confidence intervals were not reported, limiting the reliability that can be placed on the finding of significant gender differences. Additional research addressing these limitations is necessary to identify mental health as a female salient risk factor.

Trauma and abuse. Although some studies have not found a strong relationship between trauma or abuse and future criminal behaviour (e.g. Lowenkamp et al., 2001; Rettinger & Andrews, 2010), some scholars suggest that abuse and victimization may be a particularly key factor in female criminal behaviour (Belknap, 2007; Salisbury & Van Voorhis, 2009). Significant associations were found for experiences of child abuse (r = .12 to .22) and adult physical abuse (r = .14 to .24) and recidivism in samples of female offenders (Van Voorhis et al., 2010). Additionally, abuse variables were explored by Benda (2005) in a sample of 300 male and 300 female boot camp graduates. For the male sample, hazard ratios (*HR*) were obtained for several variables, including childhood physical abuse (*HR* = 1.31), recent physical abuse (*HR* = 1.03), childhood sexual abuse (*HR* = 1.37) and recent sexual abuse (*HR* = 1.01). Interestingly, the hazard ratios obtained for the female sample were much stronger for each of the abuse variables of childhood physical abuse (HR = 1.56), recent physical abuse (HR = 1.96), childhood sexual abuse (HR = 1.77) and recent sexual abuse (HR = 2.17). These results provide some indication that physical or sexual abuse experienced in childhood or in adulthood is a stronger risk factor of recidivism for female offenders than for male offenders. However, confidence intervals were not provided and so conclusions cannot be reliably drawn regarding the

differential influence of abuse for male and female offenders. Additional research directly comparing male and female offenders and addressing this limitation is required.

In samples of young offenders, abuse has been found to be a particularly important factor for females. From a sample consisting of 500 youth (78% male, 22% female), regression was used to evaluate several predictor variables associated with re-offending (Funk, 1999). The model accounting for the largest proportion of variance for males (*Adjusted* R^2 = .20) included the variables family financial hardship, poor school behaviour, detention, age 13 or 14 at time of offense, weighted prior offenses, and peer group. Interestingly, the predictor variables for female youth were vastly different and accounted for an even higher proportion of the variance of re-offending (*Adjusted* R^2 = .32). The four significant predictor variables in the model for female young offenders included prior detention, person related offences, child abuse or neglect, and running away. Overall, abuse was identified to be an important predictor of recidivism for girls, but not a significant predictor for boys.

Economic marginalization. Economic marginalization is often measured by rates of female poverty, female headed households, and part-time employment. Many feminist scholars have maintained that economic marginalization is one of the leading contributors of female crime (Belknap, 2007; Bloom et al., 2005; Chesney-Lind & Shelden, 2004; Greenfeld & Snell, 1999; Parker & Reckdenwald, 2008). In fact, Holtfreter et al. (2004) identified significant associations between poverty and the outcomes of re-arrest (r = .20) and probation or parole violation (r = .26) for female offenders. Additionally, Holtfreter et al. (2004) found that poverty added significantly to the prediction of recidivism over the LSI-R risk assessment tool. Looking only at the LSI-R, logistic regression identified

an odds ratio of 1.07 for re-arrests and 1.09 for violations. However, when poverty was included in the logistic model, poverty was found to predict recidivism with an odds ratio of 4.6 for re-arrests and 12.7 for violations, demonstrating economic marginalization to be a strong predictor of female recidivism.

Although Holtfreter et al. (2004) employed a strong statistical approach through the use of logistic regression and odds ratios, several limitations exist. The study relied on self-reported information which could have resulted in inaccuracies in the reported levels of poverty. Additionally, a male comparison sample was not included, limiting the ability to draw inferences about poverty as a gender salient or specific risk factor. As a result, further research is needed to examine the influence of poverty or economic marginalization as a risk factor for male and female offenders.

Brown and Motiuk (2005) directly compared male and female offenders on economic factors by examining several DFIA indicators pertaining to economic factors in the community functioning domain (e.g., difficulty meeting bills, has used social assistance). The magnitude of the association between these indicators and recidivism appeared similar for both males and females, except for the indicator 'difficulty meeting bills', which was significant for men but not for women. Similarly, Brown and Motiuk (2008) found that of the finance related indicators, 'no credit' was a specific predictor of recidivism for women while 'has used social assistance' was a specific predictor for men.

Gender differences were found however, on the scores obtained for the financial domain of the LSI-R (Helibrun et al., 2008). Male offenders (n = 1435) most often scored in the very low to low range (mean = 1.79) compared to female offenders (n = 886) who most often scored in the high to very high range (mean = 2.02). Although it was found

that female offenders may experience more financial problems than males, the predictive capability of finances or economic marginalization based on gender was not examined by Helibrun et al. (2008).

Self-efficacy/self-esteem. Self-efficacy has been described as a person's belief in their own ability to achieve specific goals (Bandura, 1986). Although self-efficacy is commonly equated with the concepts of self-esteem and empowerment, there are subtle differences between these constructs. Self-esteem is a feeling of being empowered to make choices to direct one's own life (Pollack, 2000), whereas empowerment is stated to be the process by which self-esteem or self-efficacy is increased (Salisbury et al., 2009). Increasing self-efficacy is stated to be an important target when providing gender responsive treatment to women offenders (Bloom et al., 2003; Bloom et al., 2005). However, few studies have empirically examined the influence of self-efficacy on recidivism in female offender samples (Salisbury et al., 2009; Van Voorhis et al., 2010).

Traditional male-dominant theories of crime have often combined the components of self-efficacy, self-esteem, and empowerment (i.e., insecurity, anxiety, powerlessness, feelings of unworthiness) into one construct of 'personal distress' (Andrews & Bonta, 2006; Andrews & Dowden, 2006). Furthermore, these constructs have been widely held by the RNR proponents to be non-criminogenic risk factors and are unimportant to the probability of recidivism (Andrews & Bonta, 2006; Andrews & Dowden, 2006). Meta-analytic results from 225 studies of predominantly male treated and non-treated offenders found the mean effect size for the relationship between personal distress and recidivism was low (*mean phi* = .06) (Andrews & Dowden, 2006). Additionally, the magnitude of

the effect size did not differ for high or low-risk offenders, indicating personal distress did not contributed to the effectiveness of treatment for reducing recidivism.

Non-significant findings have also been attained for female offenders with regard to the construct of personal distress. Personal/emotional distress was not found to be associated with general (r = .14) or violent (r = .07) recidivism and did not add incrementally to the prediction of recidivism above the 'central eight' risk factors (Rettinger & Andrews, 2010). However, some promising findings were obtained for female offenders when self-esteem or self-efficacy were specifically examined instead of the all encompassing 'personal distress' factor. Using multi-item scales to measure both self-efficacy and self-esteem, significant and negative associations were found for self-esteem (r = -.08 to -.22) and self-efficacy (r = -.12 to -.22) in a sample of female probationers, indicating that low levels of self-esteem or self-efficacy led to increases in recidivism (Van Voorhis et al., 2010). However, conflicting results were also identified as positive associations were found for self-efficacy (r = .12 to .14) in female prisoners for misconducts, and for self-esteem (r = .13 to .14) in prerelease samples for technical violations (Van Voorhis et al., 2010). Overall, when the specific factors of self-esteem and self-efficacy contained within the construct of personal distress were examined, support was identified for these variables as risk factors for women. However, more research employing a direct comparison of male and female offenders is required.

Summary and Purpose of Present Study

Overall, there appears to be evidence for the existence of gender neutral, salient, and specific risk factors. However, the majority of research examining recidivism risk factors has focused primarily on "gender neutral" factors for both male and female

offenders. Much less research has empirically tested the influence of the proposed gender salient or specific risk factors. Furthermore, even fewer studies have examined these risk factors in terms of gender differences using research designs or statistical methods that would reliably identify the differential influence of risk factors for men and women. Thus, the ability to conclusively identify risk factors as gender neutral, salient, or specific from the existing literature has been limited.

One major limitation in establishing gender neutrality/saliency/specificity is the absence of mixed gender research designs. Many of the reviewed studies examined one gender without the inclusion of a male or female comparison group (e.g., Gendreau et al., 1996; Van Voorhis et al., 2010), which limits the conclusions that can be drawn regarding the relative impact of a risk factor for one gender compared to another. Although studies examining male-only samples may be compared to studies examining female-only samples, the conclusions drawn from this approach are limited. The use of different samples along with the various approaches for analyzing data could lead to very different results (Kazdin, 2003). Thus, to establish a risk factor as specific or salient for one gender, the research design needs to include both male and female offenders.

Even when studies have included gender comparison groups, another limitation rests in the operationalization of gender salient or specific risk factors. Many studies have employed various research methods to identify the influence of risk factors for recidivism. For instance, some studies have used prevalence rates as an indicator that a variable of interest is more significant for a particular gender (e.g., Heilbrun et al., 2008). However, in the context of risk assessment, the true test of gender saliency or specificity rests in the significant predictive capability of a well defined and measured variable

which precedes the outcome of recidivism (Brown & Motiuk, 2008, Kraemer et al., 1997). Similar to Brown and Motiuk (2008), the position adopted in this proposal is that a gender specific risk factor is predictive of recidivism for one gender, but not at all for the other. Similarly, a gender salient risk factor is predictive for both males and females; however, the magnitude of the relationship is greater for one gender compared to the other. And finally, a gender neutral risk factor is found to be equally predictive for both male and female offenders.

Of the studies which have included comparison groups, many have not employed optimal statistical methods for determining gender neutrality, specificity, or saliency. Furthermore, there continues to be uncertainty regarding the meaning of "optimal". Some studies (e.g., Rowe, Vazsonyi, & Flannery, 1995) have used correlational analyses to investigate gender differences by measuring potential risk factors and criminal behaviour simultaneously. However, without establishing a variable as an antecedent prior to the criminal behaviour, the variable cannot be identified as true risk factors (Kraemer et al., 1997). Additionally, statistical methods such as correlation analysis or multiple regression techniques are highly influenced by base rates (Hanson, 2008). Hanson (2008) explains that as the probability of recidivism moves away from .50 toward one or zero, the variance in the rate of recidivism and the subsequent correlation coefficients will decrease. Receiver operating characteristic (ROC) may be a more robust measure than correlation analysis as it is not influenced by base rates. However, ROC analysis is impacted by sample variability. For instance, a sample with a restricted range of scores (e.g. all high-risk offenders) may result in relatively small area under the curve (AUC) values (Hanson, 2008; Humphreys & Swets, 1991).

A more sensitive statistical approach not impacted by base rates or sample variability is logistic regression and odds ratios (Hanson, 2008; Sanchez-Meca, Marin-Martinez, Chacon-Moscoso, 2003). Odds ratios can be conceptualized as the relative odds that one outcome will be more likely than another when a dichotomous variable is crossed with a dichotomous outcome (Sanchez-Meca et al., 2003). Several scholars have maintained that odds ratios are the most appropriate statistical approach when dichotomous variables are considered (Haddock et al., 1998; Sanchez-Meca et al., 2003). Odds ratios are not impacted by unequal sample sizes or the marginal distributions of the variables of interest, and can be utilized across various research designs (Haddock et al., 1998). A few of the studies reviewed employed odds ratios and identified several gender neutral, salient, and specific risk factors (e.g., Brown & Motiuk, 2008; Farrington & Painter, 2004). Although odds ratios may be difficult to interpret, they appear to be the most appropriate and sensitive approach to identify the differential influence of various risk factors for male and female offenders.

Purpose of the present study. The purpose of the present study is to contribute to the understanding and identification of gender neutral, salient, and specific risk factors among adult offenders. This study will significantly contribute to the existing literature in three important ways. First, a large number of potential risk/need factors will be explored through the indicators contained within the DFIA measure, allowing for an examination of several factors in addition to the 'central eight' and the frequently proposed gender specific risk factors. Second, this study will examine a large sample of female offenders as well as a large comparison sample of male offenders to establish gender neutrality, saliency, or specificity. Finally and most importantly, the present research will improve

upon previous studies by utilizing a variety of rigorous statistical methods to identify the predictive qualities of various risk factors for male and female offenders.

Hypotheses. To examine the influence of various risk/need factors of male and female crime, the following three hypotheses will be tested.

Hypothesis 1: DFIA total scores and overall rating. It is hypothesized that the DFIA complete total score (comprised of all indicators), the DFIA optimal total score (indicators that do not predict recidivism deleted), and the DFIA total need rating (three or four level professional judgment rating) will predict recidivism for both men and women. Additionally, it is expected that the magnitude of effect for the total scores and the total need level will not vary as a function of gender. Thus, evidence for only gender neutrality and not gender saliency or specificity will emerge at the total score and the total need level rating.

Hypothesis 2: DFIA domain scores and ratings. It is hypothesized that each of the seven DFIA complete domain scores (comprised of all domain indicators), the seven DFIA optimal domain scores (with non-significant domain indicators deleted), and the domain need level rating for each of the seven DFIA domains will predict recidivism for both men and women. Further to this, it is hypothesized that the magnitude of effect for the domain scores and domain need level ratings will not vary as a function of gender. Therefore, evidence will only emerge for gender neutrality and not gender saliency or specificity at the domain score or domain need level.

Hypothesis 3: Indicator level. It is hypothesized that evidence for gender saliency and/or gender specificity for both men and women will only emerge when the individual indicators are examined. When risk factors are operationalized as the individual DFIA

indicators rather than the global and all encompassing total and domain scores or ratings, gender differences will emerge. The magnitude of effect for the individual indicators will vary as a function of gender, which would otherwise be masked by total and domain scores or ratings. Therefore, evidence for gender salient and/or specific risk factors will emerge at the DFIA indicator level.

In particular, several indicators are hypothesized to emerge as significant predictors of recidivism for male and female offenders. Based on the RNR 'big four' criminogenic needs (Andrews, Bonta, et al., 1990), it is anticipated that several of the indicators within the associates and the attitude domains will predict recidivism saliently or specifically for male offenders. For instance, the indicators 'associates with substance abusers', 'has many criminal acquaintances', 'has mostly criminal friends', 'negative towards the law', 'employment has no value', and 'non-conforming' are expected to predict recidivism more strongly for male offenders. For female offenders, considering the factors theorized to be particularly salient for women, it is expected that indicators within the family, substance abuse, and the personal/emotional domains will emerge as salient or specific to female offending. In particular, the indicators 'childhood lacked family ties', 'has been a victim of spousal abuse', 'unable to handle parenting responsibilities', 'drinking has resulted in law violations', 'began using drugs at an early age', 'has participated in substance abuse treatment', 'family ties are problematic', 'copes with stress poorly', and 'diagnosed as disordered in the past' are expected to predict recidivism saliently or specifically for women.

Method

Participants

The sample was derived from an archival database provided by the Correctional Service of Canada. The database consisted of male and female federal offenders who completed the OIA procedure between November 1st, 1994, and September 1st, 2000, and who were then released prior to September 2nd, 2000 (Brown & Motiuk, 2005). The offender data base is comprised of 16,244 offenders in total, of which 765 are women. Two studies have utilized this sample of federal offenders to evaluate the validity of the DFIA measure (e.g. Brown & Motiuk, 2005, 2008).

In the present study, the entire sample of 765 female offenders was included along with a sample of 765 male offenders randomly selected from the original database. The large and evenly balanced comparison samples of male and female offenders assisted in strengthening the results of the present study as small and unequal sample sizes can lead to decreases in statistical power (Aguinis & Stone-Romero, 1997; Frazier, Tix, & Barron, 2004). The male offenders ranged in age from 23 to 87 years old and were significantly older (M = 39.86, SD = 10.72) than the female offenders (M = 38.28, SD = 9.00), t (1484) = 3.11, p = .002, who ranged in age from 23 to 71.

In regards to the male offenders, 10 (1.3%) were identified as Asian, 29 (3.8%) were Black, 44 (5.8%) were Aboriginal, 499 (65.2%) were White, and the remaining 23.9% were identified as other. Of the current offences, 76% were serving a sentence for a serious offence and 13% for a sexual offence. Additionally, 81 (10.6%) of the male offenders were identified as using a weapon during the index offence and 31 (4.1%) of the male offender's current offences resulted in death. The sentence length for male offenders ranged from 243.5 days to life in prison. Of those male offenders serving a determinate sentence, the mean sentence length was 3.72 years (SD = 2.34).

For the female offender sample, 2 (0.3%) were identified as Asian, 18 (2.4%) were Black, 125 (16.3%) were Aboriginal, 425 (55.6%) were White, and the remaining 25.4% were identified as other. Of the current offences for the female offenders, 81% were serving sentence for a serious offence and only 1% for sexual offences. Additionally, 115 (15%) of the female offenders were identified as using a weapon during the index offence and 70 (9.2%) of the female offender's current offences resulted in death. The length of sentence for female offenders ranged from 2 years to life in prison. For the female offenders serving a determinate sentence, the mean sentence length was 3.34 years (*SD* = 1.87).

Measures

Dynamic Factors Identification and Analysis (DFIA; Brown & Motiuk, 2005; Motiuk, 1997**).** The Offender Intake Assessment procedure is completed for each offender upon entering the Canadian federal correctional system. A core component of this procedure is the DFIA which assesses the dynamic factors to be targeted during treatment to reduce the probability of recidivism. The DFIA consists of seven dynamic factor domains including employment, marital/family, associates and social interaction, substance abuse, community functioning, personal and emotional orientation, and attitude. These domains are divided into 35 principle components, which are further divided into 94 subcomponents, and then by 197 indicators (see Appendix A).

The DFIA is conducted by parole officers and is based on several sources of information such as police reports, court related documents, self-reports, interviews, direct observation, and reports from other community sources (Motiuk, 1997). Using the available information, the parole officer scores the indicators which are comprised of

yes/no statements (e.g. drug use interferes with employment). These indicators then serve to structure the professional judgment of the parole officer in determining a need level rating for each of the components, each domain, and for the overall total intervention need rating of low, medium, or high.

Good concurrent validity has been found for the overall OIA procedure (Motiuk, 1997). Correlation coefficients demonstrated significant associations between the overall OIA risk level and criminal history records (r = .17 to .49). These findings were similar to the correlations obtained for other risk measures (e.g. institutional adjustment score, security risk score, and the SIR-R1) with each assessment measure demonstrating moderate to large positive correlations with recidivism.

With regard to the reliability of the DFIA, acceptable internal consistency of the indicators has been found (Brown & Motiuk, 2005). The internal consistency was explored across samples of male, female, and aboriginal offenders. Cronbach's alpha analysis revealed acceptable internal consistency estimates for each of the domains which ranged from .62 to .96. Other forms of reliability, such as inter-rater and test-re-test reliability have not been examined however parole officers are extensively trained prior to administering the OIA and are also monitored afterwards for quality assurance purposes.

Outcome measure. From the archival dataset, the outcome variable of recidivism was operationalized dichotomously as a readmission to federal custody either pre or post warrant expiry (Brown & Motiuk, 2005). Readmission was scored '1' and no readmission was scored '0'. This included all offenders who were readmitted for a new offence, or re-admitted due to any conditional violation. A three-year fixed follow-up

period was set to allow sufficient time for offenders to recidivate. Consistent with past findings (e.g. Lowenkamp & Letessa, 2005) higher rates of recidivism were identified for the male offenders in the present study compared to the female offenders. Forty-four percent of the male offender sample was readmitted with or without an offence, and 14% were readmitted with a confirmed conviction. For the female offender sample, 32% were readmitted with or without an offence and only 8% were readmitted with a confirmed conviction. Because the rate of recidivism as re-admittance with a confirmed conviction was low for both male and female offenders, recidivism operationalized as readmitted with or without an offence was used as the outcome variable in the present study.

Data Preparation

Eliminated variables and default indicators. The database was examined using PASW (formally SPSS) Version 18. Prior to any analyses, the 197 indicators were examined to identify those suitable for inclusion in the following analyses. The dichotomous indicators identified with a proportional split in excess of 90%-10% were considered for elimination from the dataset. Only the indicators demonstrating this split in both male and female offender samples were removed. Indicators demonstrating a skewed distribution for only one gender but not the other were retained. This resulted in the removal of 39 indicators (see Table 1), leaving 158 indicators for the analyses.

Table 1

Indicators Removed from Dataset.

Domain	Indicator Removed
Employment	Has physical problems that interfere with work Often shows up late for work*

Table 1 (continued).

Domain	Indicator Removed
	Has poor attendance record*
	Has difficulty meeting workload requirements*
	Has difficulty with co-workers*
	Has difficulty with supervisors*
Marital/Family	Unable to control the child's behaviour*
	Perceives self as unable to control the child's behaviour*
	Supervises the child improperly*
	Does not participate in activities with the child*
	Has been arrested for child abuse*
	Has been arrested for incest*
	Has completed a marital/family intervention program
Community Functioning	Residence in poorly maintained
	Has poor self-presentation
	Has poor hygiene
	Has dietary problems
	Unable to express verbally
	Unaware of social services
	Prior assessment for community functioning
	Has participated in a community skills program
	Has completed a community skills program
Personal/Emotional	Physical prowess problematic
	Ethnicity is problematic
	Religion is problematic
	Gang member
	Gambling is problematic
	Has difficulty performing sexually
	Sexuality identity problem
	Mentally deficient
	Diagnosed as disordered currently
	Current hospitalization
	Receiving outpatient services prior to admission
Attitude	Marital/family relations have no value
	Interpersonal relations have no value
	Elderly have no value
	Ethnically intolerant

Table 1 (continued).

Domain	Indicator Removed
	Intolerant of other religions
	Intolerant of disabled persons

Note. * Indicates default domain indicator eliminated from analyses. The meaning of a default indicator is described in the next paragraph.

Of the eliminated indicators, five were default indicators in the employment domain and six were default indicators in the marital/family domain (see Table 1). Default indicators are those which are only applicable following the affirmative identification of a particular trigger variable. Three of the DFIA domains (employment, marital/family, and substance abuse), contain default indicators based on the positive identification of trigger variables within each domain (see Table 2). For example, if an offender scored 'yes' or '1' on the trigger variable 'has been married/common-law in the past', then the default indicators 'dissatisfied with current relationship', 'money problems affect relationship(s)', 'has been a victim of spousal abuse', etc, would apply to that offender. However, if an offender scored 'no' or '0' on the trigger variable 'abuses alcohol', then the default indicators 'began drinking at an early age', 'drinks on a regular basis', 'has history of drinking binges', etc, would not apply to that offender. It is important to note that the affirmation of a trigger indicator does not always rest on a score of 'yes' or '1'. For two of the trigger indicators (has no employment history in the employment domain, and has no parenting responsibilities in the marital/family domain), a score of 'no' or '0' indicates the affirmation of the trigger indicator. Thus, a score of

'no' or '0' for the trigger indicator 'has no employment history' would signify the applicability of the corresponding default indicators (i.e. has unstable job history, often shows up late for work, etc). However, a score of 'yes' or '1' for the trigger indicator 'has no employment history' would indicate the corresponding default indicators would not apply.

Table 2

Trigger Indicators and Default Indicators.

DFIA domain	Trigger Indicator[a]	Default Indicators (answered only if trigger indicator was affirmed)
Employment	Has no Employment history[b]	Has unstable job history Often shows up late for work Has poor attendance record Difficulty meeting workload requirements Lacks initiative Has quit a job without another Has been laid off from work Has been fired from a job Salary has been insufficient Lacks employment benefits Job lacks security Has difficulty with co-workers Has difficulty with supervisors
Marital/Family	Has been married common-law in the past[c]	Dissatisfied with current relationship Money problems affect relationship(s) Sexual problems affect relationship(s) Communication problems affect the relationship(s) Has been a victim of spousal abuse Has been a perpetrator of spousal abuse
	Has no parenting responsibilities[b]	Unable to handle parenting responsibilities Unable to control the child's behaviour Perceives self unable to control child's behaviour

Table 2 (continued).

DFIA domain	Trigger Indicator[a]	Default Indicators (answered only if trigger indicator was affirmed)
		Supervises the child improperly
		Does not participate in activities with child
		Lacks understanding of child development
		Family is unable to get along as a unit
		Has been arrested for child abuse
		Has been arrested for incest
Substance Abuse	Abuses alcohol[c]	Began drinking at an early age
		Drinks on a regular basis
		Has history of drinking binges
		Has combined the use of alcohol and drugs
		Drinks to excess during leisure time
		Drinks to excess in social situations
		Drinks to relieve stress
		Drinking interferes with employment
		Drinking interferes marital/family relations
		Drinking interferes with social relations
		Drinking has resulted in law violations
		Drinking interferes with health
	Abuses drugs[c]	Began using drugs at an early age
		Uses drugs on a regular basis
		Has gone on drug-taking sprees
		Has combined the use of different drugs
		Uses drugs to excess during leisure time
		Uses drugs to excess in social situations
		Uses drugs to relieve stress
		Drug use interferes with employment
		Drug use interferes with marital/family relations
		Drug use interferes with social relations
		Drug use has resulted in law violations
		Drug use interferes with health

Note. [a] Trigger indicators are DFIA indicators that when affirmed, signify the applicability of corresponding default indicators. When trigger indicators are not affirmed, the corresponding default indicators are not applicable. [b] Affirmation of the trigger indicator identified by a score of '0' or 'no'. [c] Affirmation of the trigger indicator identified by a score of '1' or 'yes'.

Creation of predictor variables. Based on the remaining indicators (n = 158) following the elimination of those with disproportional splits, total scores for the overall DFIA measure and the each of the domains were computed. To create the DFIA complete total score, all of the remaining, positively endorsed indicators (i.e. those identified as 'yes') were summed. For the complete domain scores, all of the positively endorsed indicators within each domain were summed to create a total score for each of the seven DFIA domains. However, when the summation included default indicators, the total scores were generated by prorating the scores. Prorated scores were based on calculations which considered the raw score from all existing indicators and the number of missing indicators (e.g. X / # all existing indicators = # identified indicators / # indicators excluding default indicators). The purpose of prorating the total scores was to account for the exclusion of indicators in cases where the trigger variable rendered the default indicators non applicable. As a result, the total score and domain scores had consistent ranges across all offenders regardless if some of the default indicators were only applicable to some. Thus, for total scores containing default indicators, analyses were based on the prorated total scores in the place of the standard summated total score.

The optimal total score was generated based on the summation of only the indicators found to significantly predict recidivism at the univariate level. Specifically, 158 separate logistic regressions were conducted, one for each of the 158 indicators remaining in the analyses for the present study. The 158 logistic regressions used each indicator as a predictor variable and recidivism as the outcome variable. This was performed for the entire offender sample, and then again separately for male and female

offenders (to allow for the testing of each hypothesis). The results of these regressions are presented in Tables 3 through 9.

Of the indicators significantly predictive of recidivism for the full sample, those which were positively endorsed for the full sample were summed to generate an optimal total score for the full sample of males and females combined. This was repeated for the male sample, with the summation of the positively endorsed indicators significantly predictive of recidivism for men to generate an optimal total score for male offenders. And finally, the summation of the positively endorsed indicators significantly predictive of recidivism for women was employed to generate an optimal total score for females.

Given the large sample size and the large number of comparisons, a conservative approach based on the magnitude of the significant effect was used to identify 'significant' indicators. Specifically, only indicators that had odds ratios with 95% confidence intervals exclusive of 1.0 were retained. Furthermore, the magnitude of each odds ratio was evaluated as a small effect (1.40 to 2.20 or reciprocal 0.71 to 0.42), a moderate effect (2.30 to 3.60 or reciprocal 0.43 to 0.28), or a large effect (3.70+ or reciprocal 0.27 to 0). Additionally, each of the optimal total scores for the full sample, for males, and for females were prorated (as previously described) in cases where the default indicators significantly predicted recidivism but were not applicable.

Table 3

Odds Ratios for the Employment Domain Indicators and Recidivism for the Total Offender Sample, Male Offenders, and Female Offenders.

	Odds Ratios		
Employment Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Has less than grade 8?	1.54**	1.14	2.05***
Has less than grade 10?	1.84***	1.41*	2.23***
Has no high school diploma?	1.59***	1.31	1.69**
Finds learning difficult?	1.64***	1.26	2.06***
Has learning disabilities?	1.58**	1.34	1.72*
Has memory problems?	1.57**	1.38	1.72**
Has concentration problems?	2.08***	1.83***	2.26***
Has problems with reading?	1.39*	1.07	1.66*
Has problems with writing?	1.48**	1.08	1.94**
Has problems with numeracy?	1.46**	1.11	1.71**
Has difficulty understanding instructions?	1.36	1.18	1.54
Lacks a skill area/trade/profession?	1.82***	1.82***	1.98***
Dissatisfied with area/trade/profession?	1.65***	1.68***	1.78***
Physical problems interfere with work?	1.31	1.18	1.46
Has no employment history?	2.47***	3.01***	2.74***
Unemployed at the time of arrest?	2.86***	3.16***	3.29***
Unemployed 90% or more?	2.38***	2.83***	2.82***
Unemployed 50% or more?	2.65***	3.08***	2.82***
Has an unstable job history?	2.58***	2.45***	3.37***
Lacks initiative?	2.66***	2.20***	2.77**
Has quit a job without another?	1.16	1.09	1.20
Has been laid off from work?	1.04	0.95	0.79
Has been fired from a job?	0.96	1.03	0.75
Salary has been insufficient?	1.10	1.23	0.97
Lacks employment benefits?	1.08	1.47**	0.74
Job lacks security?	1.00	1.31	0.69*
Prior vocational assessment(s)?	1.19	1.39	1.10
Participated in employment programs?	0.89	1.02	0.81
Finished occupational program?	0.66**	0.64	0.75

Note. Confidence intervals for the odds ratios of the indicators identified as significantly predictive of recidivism do not contain the value 1.
* $p < .05$ ** $p < .01$ *** $p < .001$

Table 4

Odds Ratios for the Associates Domain Indicators and Recidivism for the Total Offender Sample, Male Offenders, and Female Offenders.

	Odds Ratios		
Associates Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Social isolated?	1.09	1.33	1.00
Associates with substance abusers?	3.52***	2.99***	3.99***
Has many criminal acquaintances?	3.04***	3.07***	2.81***
Has mostly criminal friends?	3.26***	2.77***	3.70***
Has been affiliated with a gang?	1.10	0.91	1.29
Resides in a criminogenic area?	1.97***	1.84**	2.40***
Unattached to any community groups?	1.74***	1.40*	2.07***
Relations are described as predatory?	1.39*	1.08	1.79*
Often victimized in social relations?	1.03	1.06	1.22
Easily influenced by others?	1.21	1.26	1.18
Difficulty communicating with others?	1.24	1.16	1.37

Note. Confidence intervals for the odds ratios of the indicators identified as significantly predictive of recidivism do not contain the value 1.
* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5

Odds Ratios for the Marital/Family Domain Indicators and Recidivism for the Total Offender Sample, Male Offenders, and Female Offenders.

	Odds Ratios		
Marital/Family Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Childhood lacked family ties?	1.68***	1.67**	1.77**
Mother absent during childhood?	1.40*	1.62*	1.35
Maternal relations negative as a child?	1.56***	1.45*	1.98***
Father absent during childhood?	1.34**	1.81***	1.08
Paternal relations negative as a child?	1.59***	1.81***	1.40*
Parent's relationship dysfunctional during childhood?	1.65***	1.85***	1.61**
Spousal abuse during childhood?	1.69***	1.85***	1.67**
Sibling relations negative during childhood?	0.91	1.01	0.95
Other relative relations negative in childhood?	1.53**	1.44	1.89**
Family members involved in crime?	1.94***	2.00***	2.01***
Currently single?	1.31*	1.95***	0.84
Has been married/common-law in the past?	1.15	0.86	1.72*
Dissatisfied with current relationship?	1.04	1.26	0.84
Money problems affect relationship(s)?	1.28*	1.35	1.28
Sexual problem affect relationship(s)?	1.04	0.54*	1.82**
Communication problems affect the relationship(s)?	1.17	1.24	1.16
Has been a victim of spousal abuse?	1.15	1.35	1.75*
Has been a perpetrator of spousal abuse?	1.81***	1.45*	2.15***
Has no parenting responsibilities?	1.26*	1.20	1.28
Unable to handle parenting responsibilities?	1.68***	1.19	2.46***
Lacks an understanding of child development?	1.54*	1.06	2.32**
Family is unable to get along as a unit?	1.51**	1.19	1.87**
Prior marital/family assessment(s)?	1.43*	1.59	1.62*
Has participated in marital/family therapy?	0.97	1.06	1.03

Note. Confidence intervals for the odds ratios of the indicators identified as significantly predictive of recidivism do not contain the value 1.
* $p < .05$ ** $p < .01$ *** $p < .001$

Table 6

Odds Ratios for the Substance Abuse Domain Indicators and Recidivism for the Total Offender Sample, Male Offenders, and Female Offenders.

	Odds Ratios		
Substance Abuse Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Abuses alcohol?	2.46***	2.13***	2.54***
Began drinking at an early age?	2.78***	2.77***	2.50***
Drinks on a regular basis?	2.63***	2.37***	2.60***
Has history of drinking binges?	2.28***	1.98***	2.40***
Has combined the use of alcohol and drugs?	2.93***	2.90***	2.74***
Drinks to excess during leisure time?	2.28***	2.27***	2.04***
Drinks to excess in social situations?	2.34***	2.43***	1.99***
Drinks to relieve stress?	2.19***	2.13***	2.10***
Drinking interferes with employment?	2.56***	2.05***	3.13***
Drinking interferes with marital/family relations?	2.14***	1.78***	2.47***
Drinking interferes with social relations?	2.08***	1.74**	2.36***
Drinking has resulted in law violations?	2.37***	2.10***	2.39***
Drinking interferes with health?	1.93***	1.85**	2.02**
Abuses drugs (solvents, prescription, etc.)?	4.17***	3.51***	4.89***
Began using drugs at an early age?	4.07***	4.18***	3.80***
Uses drugs on a regular basis?	4.58***	4.54***	4.65***
Has gone on drug-taking sprees?	3.93***	3.48***	5.01***
Has combined the use of different drugs?	3.36***	2.89***	4.05***
Uses drugs to excess during leisure time?	3.86***	3.61***	4.03***
Uses drugs to excess in social situations?	4.35***	4.31***	4.20***
Uses drugs to relieve stress?	3.53***	3.27***	4.28***
Drug use interferes with employment?	3.59***	3.46***	4.15***
Drug use interferes with marital/family relations?	4.03***	4.39***	4.24***
Drug use interferes with social relations?	3.57***	3.55***	4.00***
Drug use has resulted in law violations?	3.64***	3.25***	4.42***
Drug use interferes with health?	3.67***	4.21***	4.24***
Prior substance abuse assessment(s)?	2.97***	2.67***	3.22***
Has participated in substance abuse treatment?	2.94***	2.30***	3.90***
Has completed substance abuse treatment?	2.57***	2.47***	2.60***

Table 6 (continued).

Note. Confidence intervals for the odds ratios of the indicators identified as significantly predictive of recidivism do not contain the value 1.
* p < .05 **p < .01 ***p < .001

Table 7

Odds Ratios for the Community Functioning Domain Indicators and Recidivism for the Total Offender Sample, Male Offenders, and Female Offenders.

	Odds Ratios		
Community Functioning Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Has unstable accommodation?	2.31***	2.34***	2.31***
Has physical problems?	1.28*	1.02	1.65**
Has dental problems?	1.45*	0.94	2.28***
Difficulty meeting bills?	1.11	1.29	0.94
Has outstanding debts?	0.90	0.94	0.87
Has no bank accounts?	2.10***	2.23***	2.04***
Has no credit?	1.78***	1.91***	1.76**
Has no collateral?	1.79***	2.24***	1.47*
Has problems writing?	1.47**	1.15	1.72*
Has no hobbies?	2.03***	1.74**	2.21***
No participation in organized activities?	1.91***	1.53**	2.14***
Has used social assistance?	2.05***	1.95***	2.56***

Note. Confidence intervals for the odds ratios of the indicators identified as significantly predictive of recidivism do not contain the value 1.
* p < .05 **p < .01 ***p < .001

Table 8

Odds Ratios for the Personal/Emotional Domain Indicators and Recidivism for the Total Offender Sample, Male Offenders, and Female Offenders.

	Odds Ratios		
Personal/Emotional Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Feels especially self-important?	1.16	1.04	1.13
Family ties are problematic?	1.79***	1.74***	1.90***
Unable to recognize problem areas?	1.06	1.20	0.75
Has difficulty solving interpersonal problems?	1.83***	1.57**	1.77***
Unable to generate choices?	1.27*	1.37*	1.07
Unaware of consequences?	0.83	1.01	0.65**
Goal setting is unrealistic?	1.80***	1.86***	1.33
Has disregard for others?	1.84***	1.35*	2.41***
Socially unaware?	1.67***	1.37	1.81*
Impulsive?	2.35***	2.30***	2.26***
Incapable of understanding the feelings of others?	1.74***	1.34	2.15**
Narrow and rigid thinking?	1.89***	1.59**	1.93**
Aggressive?	2.21***	1.97***	2.21***
Assertion problem?	0.92	0.96	0.92
Copes with stress poorly?	2.36***	2.03***	2.62***
Poor conflict resolution?	1.93***	2.10***	1.58**
Manages time poorly?	2.63***	2.16***	2.96***
Has low frustration tolerance?	2.46***	1.98***	2.97**
Hostile?	1.68***	1.58*	1.60*
Worries unreasonably?	1.26	1.38	1.31
Takes risk inappropriately?	1.74***	1.88***	1.84***
Thrill seeking?	2.08***	1.79**	2.44***
Non-reflective?	1.54***	1.44*	1.29
Is not conscientious?	2.31***	2.05***	2.12**
Manipulative?	1.97***	1.41*	2.71***
Inappropriate sexual preferences?	0.51**	0.34***	1.16
Sexual attitudes are problematic?	1.00	0.60*	2.30**
Diagnosed as disordered in the past?	1.72**	2.50**	1.55*
Prior personal/emotional assessment(s)?	1.36*	1.53*	1.31
Prescribed medication in the past?	1.33*	1.42	1.61**

Table 8 (continued).

	Odds Ratios		
Personal/Emotional Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Prescribed medication currently?	1.14	1.62	1.27
Past hospitalization?	1.19	1.36	1.24
Received outpatient services in the past?	1.48**	1.79**	1.53*
Past program participation?	1.53**	1.42	1.72**
Current program participation?	1.44*	1.64	1.69**

Note. Confidence intervals for the odds ratios of the indicators identified as significantly predictive of recidivism do not contain the value 1.
* p < .05 **p < .01 ***p < .001

Table 9

Odds Ratios for the Attitude Domain Indicators and Recidivism for the Total Offender Sample, Male Offenders, and Female Offenders.

	Odds Ratios		
Attitude Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Negative towards the law?	2.47***	2.11***	2.60***
Negative towards police?	2.12***	2.05***	1.86**
Negative towards courts?	1.92***	1.97***	1.51*
Negative towards corrections?	2.37***	2.32***	2.09**
Negative towards community supervision?	3.03***	2.70***	2.90***
Negative towards rehabilitation?	1.68**	1.30	2.17*
Employment has no value?	2.52***	2.07***	2.86***
Values substance abuse?	2.95***	2.51***	3.26***
Basic life skills have no value?	2.40***	1.96**	2.75*

Table 9 (continued).

	Odds Ratios		
Attitude Domain Indicator	Total sample (N = 1530)	Men (n = 765)	Women (n = 765)
Personal/emotional stability has no value?	2.06***	1.71*	2.31*
Women/men roles are unequal?	1.37*	1.45	1.29
Disrespectful of personal belongings?	3.22***	2.91***	3.21***
Disrespectful of public property?	3.53***	2.92***	4.14***
Disrespectful of commercial property?	3.09***	2.67***	3.27***
Supportive of domestic violence?	1.79**	1.33	2.95*
Supportive of instrumental violence?	2.03***	1.52**	2.86***
Lacks direction?	2.82***	2.22***	3.28***
Non conforming?	2.39***	2.56***	1.78**

Note. Confidence intervals for the odds ratios of the indicators identified as significantly predictive of recidivism do not contain the value 1.
* $p < .05$ ** $p < .01$ *** $p < .001$

The DFIA total need level was also used to test the first hypothesis and was obtained directly from the dataset. The total need level was a subjective rating of an offender's overall intervention level and ranged from low, medium, to high. The subjective total need level rating was provided by parole officers based on the number of identified DFIA indicators as well as other collateral sources of information (e.g. community assessments, medical information).

Statistical Analyses

All of the hypotheses were tested using three primary analytic approaches. For example, in regards to Hypothesis 1 the following analytic strategy was employed. First, for the women, three receiver operator characteristic analyses were conducted corresponding to each predictor variable—complete total DFIA score, optimal DFIA

score, and DFIA overall need level rating. Recidivism was the outcome variable. Next, three logistic regression analyses were conducted, again corresponding to each predictor variable—complete total DFIA score, optimal DFIA score and DFIA overall need level rating with recidivism as the outcome variable. This procedure was then repeated for the men. Third, three moderated logistic regression analyses were employed for the combined sample of men and women. For example, the first moderated logistic regression entered gender and the complete total DFIA score in block 1, followed by the interaction term of the complete total DFIA score and gender. The next two moderated logistic regressions included the optimal DFIA score and the DFIA overall need level rating.

An identical procedure was then followed for Hypothesis 2 and 3. However, all Hypothesis 2 related analyses used the domain variables as predictors—seven complete DFIA domain scores, seven optimal DFIA domain scores and seven domain need level ratings. Similarly, all Hypothesis 3 related analyses used the individual indicators as predictors—158 in total.

Exploratory analysis: Incremental predictive validity. In addition to the stated hypotheses, some exploratory analyses were also performed. The purpose of these analyses was to evaluate the incremental predictive validity of the identified gender neutral and gender salient and/or specific indicators for women offenders. This was accomplished in two ways. First, the ability of the strongest subset of gender salient/specific indicators to add incrementally above and beyond the strongest subset of gender neutral indicators using a hierarchical logistic regression with recidivism as the outcome variable was conducted first. In this analysis, the strongest subset of gender

neutral indicators was entered into the first block of the hierarchical logistic regression analysis followed by the strongest subset of gender salient/specific indicators. Next, the process was repeated to identify if the gender neutral predictors could add incrementally to the prediction of recidivism above and beyond the gender salient/specific predictors. In this analysis, the strongest subset of gender salient/specific indicators was entered into the first block of the hierarchical logistic regression analysis and then the strongest subset of gender neutral predictors were entered into the second block.

Results

Data Screening

Missing data, outliers, and assumptions. Prior to the initiation of the present study, the database provided by CSC was screened by previous researchers (i.e. Brown & Motiuk, 2008) for missing data. The percentage of missing data ranged from 0% to 17.4% across all of the 197 indicators. However, most of the indicators for the male offenders (94%) and the female offenders (98%) had no more than 3% missing data at the indicator level. As a result, mode substitution was utilized as an appropriate imputation method to address the missing data.

Outliers were examined next. As described previously, the frequency of the scores for each of the dichotomous indicators as well as the total and domain need level ratings was examined to identify extremely uneven splits (90%-10% split). Thirty-nine indicators were found to demonstrate this excessive split in both the male and female samples. As a result, these indicators were excluded from the study leaving 158 indicators for analysis (see Table 1). The complete total scores and optimal total scores for the overall DFIA and the domain levels were also examined for the presence of

outliers by converting these variables into *z*-scores. A standardized *z-score* greater than 3.29 indicates the presence of an outlier. However, no outliers were identified as the *z*-score values for each of the variables fell within the ± 3 standard deviation range.

Based on the analyses used in the present study (i.e., receiver operating characteristic and logistic regression), the assumptions of linearity and normality were not applicable (Landau & Everitt, 2004, Rice & Harris, 1995). The only true assumption for logistic regression or ROC analysis is for the outcome to be a discrete binary variable, such as the outcome variable recidivism/no recidivism in the present study. However, the findings of logistic regression in particular may be impacted by high levels of multicollinearity (Tabachnick & Fidell, 2007). The analyses conducted for the total scores and need ratings for the overall DFIA and domains were conducted individually for each variable, so multicollinearity was not considered for these variables. However, many of the indicators were examined in combination, thus multicollinearity diagnostic statistics were used to examine the correlation coefficients between these variables. Tolerance values were not below 0.10 and the largest Variance Inflation Factor value was identified as 7.10, indicating that multicollinearity was not an issue. Exploration of the correlation matrix for the DFIA indicators revealed some large correlations but none were above .90—the benchmark proposed by Tabachnick and Fidell (2007) as indicative of multicollinearity.

Descriptive Statistics

Descriptive statistics were employed to examine differences between male and female offenders with regard to scores on the DFIA. Through independent *t*-tests, gender differences were found in the total scores and domain scores excluding the associates

complete domain score, associates optimal domain score, and the community functioning optimal domain score (see Table 10). Specifically, women scored significantly higher on the family domain score, the optimal family domain score and the optimal employment domain score. The male offenders scored significantly higher than the female offenders on the remaining total and optimal total scores.

Table 10

Mean Differences in the DFIA Total and Domain Scores by Gender.

	Males (n = 765)	Females (n = 765)		
Variable	*Mean (SD)*	*Mean (SD)*	*Difference*	*T*
Overall DFIA Scores				
DFIA Total Score	56.65 (24.11)	49.02 (24.18)	7.64	6.18***
DFIA Optimal Score	47.30 (21.69)	39.00 (21.78)	8.30	7.47***
DFIA Domain Scores				
Employment Domain	10.65 (5.34)	9.60 (4.73)	1.05	4.06***
Family Domain	6.97 (3.83)	7.98 (4.29)	-1.01	-4.86***
Associates Domain	3.70 (2.25)	3.56 (2.25)	0.23	1.20
Substance Domain	13.71 (9.19)	11.84 (10.37)	1.87	3.72***
Community Domain	4.98 (2.47)	4.70 (2.21)	0.28	2.35*
Personal Domain	11.68 (6.38)	9.22 (6.20)	2.47	7.68***
Attitude Domain	4.97 (4.06)	2.12 (2.94)	2.85	15.71***
DFIA Optimal Domain Score				
Optimal Employment	2.43 (3.22)	3.35 (4.38)	-0.92	-5.29***
Optimal Family	1.73 (2.51)	2.51 (3.38)	-0.78	-5.92***
Optimal Associates	1.22 (1.64)	1.12 (1.64)	0.10	1.31
Optimal Substance	6.85 (9.45)	5.92 (9.43)	0.93	2.27*
Optimal Community	1.76 (2.28)	1.93 (2.40)	-0.17	-1.58
Optimal Personal	4.40 (5.61)	3.25 (4.58)	1.15	4.97***
Optimal Attitude	2.27 (3.45)	0.99 (2.23)	1.28	10.82***

Note. Standard deviations appear in parentheses. *Difference* represents the mean difference between the male and female scores.
* $p < .05$ ** $p < .01$ *** $p < .001$

Chi-square analyses were used to examine differences in the DFIA total and domain need levels for each gender. Significant differences were observed in the distribution of the need level ratings for the overall total need level and each of the domain need level ratings (see Table 11). When comparing the males and females on the different need levels, three trends were observed with regard to the distribution of the need level ratings. First, for several of the need level variables (total need level, substance need level, personal/emotional need level, and attitude need level), women tended to score more often in the lower need levels compared to men and men scored more often in the higher need levels compared to women. The second trend for several of the variables (employment need level, associates need level, and community functioning need level) identified women to score higher on the third need level (some need for improvement) compared to men, whereas men tended to score higher on the extreme need levels of 'factor seen as an asset to community adjustment' and 'considerable need for improvement'. The final trend was only identified for one need variable (marital/family need level) which demonstrated that women scored more often in the higher need levels compared to men who more often scored in the lower need levels for this domain.

Table 11

Descriptive Statistics for Total DFIA Need Rating and Domain Need Level Ratings.

	Male (n = 765)				Female (n = 765)				
	Need Levels[a] (%)				Need Levels[a] (%)				
Need Variable	1	2	3	4	1	2	3	4	χ^2
Total Need[b]	36.4	47.0	63.1	n/a	63.6	53.0	36.9	n/a	64.04*
Employment	68.8	57.5	41.1	55.5	31.2	42.5	58.9	44.5	49.00*
Marital	58.9	60.9	41.7	43.3	41.1	39.1	58.3	56.7	49.82*
Associates	52.5	50.7	42.7	63.2	47.5	49.3	57.3	36.8	36.90*
Substance	42.9	56.1	53.4	50.0	57.1	43.9	46.6	50.0	18.54*
Community	59.6	52.1	43.9	68.2	40.4	47.9	56.1	31.8	30.51*
Personal	46.0	41.1	60.4	50.0	54.0	58.9	39.6	50.0	49.78*
Attitude	35.2	38.5	65.9	79.2	64.8	61.5	34.1	20.8	172.05*

Note. [a]Need level ratings differ for total and domain levels. Total need levels are as follows: (1) Low, (2) Medium, (3) High. Domain need levels range from (1) Factor seen as an asset to community adjustment to (4) Considerable need for improvement. [b]Total need ratings consist of only 3 levels.
* $p < .001$

Hypothesis 1 Results: Total DFIA Level

Hypothesis 1 results: ROC analysis by gender. Each of the three predictor variables (complete total score, optimal total score, and the total need level) were identified as a significant predictor of recidivism for both men and women, with AUC coefficients ranging from .64 to .77 (see Table 12). Although, larger AUC coefficients were observed for females for each of the predictor variables, the confidence intervals were found to overlap between male and female offenders. Thus, consistent with

hypothesis 1, only evidence for gender neutrality emerged when total DFIA scores or need levels were used as predictors

Table 12

DFIA Predictive Validity Results by Gender: ROC Results.

Variable	*AUC*	*SE*	95% Confidence Interval
Males (n = 765)			
Complete total score	0.72*	0.02	0.69 – 0.76
Optimal total score	0.74*	0.02	0.71 – 0.78
Total need level	0.64*	0.02	0.60 – 0.68
Females (n = 765)			
Complete total score	0.75*	0.02	0.72 – 0.79
Optimal total score	0.77*	0.02	0.74 – 0.80
Total need level	0.68*	0.02	0.64 – 0.72

Note. AUC represents the Area Under Curve Coefficient. *SE* represents the standard error.
* $p < .001$

Hypothesis 1 results: Logistic regression analyses by gender. As indicated in Table 13, all six logistic regression results generated significant findings. Each of the predictor variables (complete total score, optimal total score, and total need level) were significantly predictive of recidivism for both male and female offenders (see Table 13). When examining the complete total score and the optimal total score, the identified odds ratios were identical and quite small for both the male and female samples. Additionally, the 95% confidence intervals for the complete total score and the optimal total score variables demonstrated an overlap between the male and female offenders. For the total need level rating, the magnitude of the effect differed between the male and female offenders with a small effect identified for men and a moderate effect identified for

women. However, the 95% confidence intervals were again found to overlap between the male and female offenders.

Table 13

DFIA Predictive Validity Results by Gender: Logistic Regression Results Disaggregated by Gender.

Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Males (*n* = 765)					
Complete total score	0.04	0.00	97.49*	1.04	1.03 – 1.05
Total optimal score	0.05	0.01	116.57*	1.05	1.04 – 1.06
Total need level	0.80	0.11	52.89*	2.23	1.80 – 2.76
Females (*n* = 765)					
Complete total score	0.04	0.00	101.86*	1.04	1.03 – 1.05
Total optimal score	0.05	0.01	119.17*	1.05	1.04 – 1.06
Total need level	0.99	0.12	71.03*	2.68	2.13 – 3.37

Note. Each row in the table represents a separate logistic regression result. Thus, six separate logistic regressions were conducted in total, each with its own corresponding predictor variable (e.g., 'complete total score' for the male sample). *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval.
* $p < .001$

Hypothesis 1 results: Moderated logistic regression results for combined sample.

Moderated logistic regression results for the complete total score. A hierarchical logistic regression was employed to examine the complete total score as a predictor variable and gender as a moderating variable. Both the complete total score and gender were entered into the first block, followed by the interaction term in the second block. The findings revealed that the complete total score was a significant predictor of recidivism in the first block and second block of the regression model (see Table 14).

However, the interaction term was not significant, indicating that gender did not moderate the relationship between the complete total score and recidivism.

Table 14

Moderated Hierarchical Logistic Regression: DFIA Complete Total Score by Gender.

Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Complete Total score	0.04	0.00	199.28***	1.04	1.03 – 1.04
Gender	0.28	0.12	6.01*	1.33	1.06 – 1.67
Block 2					
Complete Total score	0.04	0.00	101.86***	1.04	1.03 – 1.05
Gender	0.41	0.32	1.65	1.51	0.81 – 1.84
Complete Total score x gender	-0.002	0.00	0.19	1.00	0.99 – 1.01
Nagelkerke R^2	0.22				
Model χ^2 ($df = 3$)	263.89***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald Chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$

Moderated logistic regression results for the optimal total score. The optimal total score was then examined through hierarchical logistic regression with the optimal total score as a predictor variable and gender as a moderating variable. Again, the optimal total score and gender were entered into the first block followed by the interaction term in the second block. The optimal total score was found to significantly predict recidivism in the first block and second block of the regression model (see Table

15). However, gender was not found to moderate the relationship between the optimal total score and recidivism as the interaction term was not significant.

Table 15

Moderated Hierarchical Logistic Regression: DFIA Optimal Total Score by Gender.

Domain Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Optimal total score	0.45	0.00	222.73*	1.05	1.04 – 1.05
Gender	0.21	0.12	3.21	1.23	0.98 – 1.55
Block 2					
Optimal total score	0.05	0.00	114.82*	1.05	1.04 – 1.06
Gender	0.38	0.31	1.51	1.46	0.80 – 2.65
Optimal total score x gender	-0.004	0.01	0.34	1.00	0.99 – 1.01
Nagelkerke R^2	0.24				
Model χ^2 (df = 3)	298.34*				

Note. N = 1530. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald Chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* p < .001

Moderated logistic regression results for the total need level. The total need level rating was then examined through hierarchical logistic regression with gender as a moderating variable. Both the total need level and gender were entered into the first block, followed by the interaction term in the second block. The results demonstrate that the need level rating was a significant predictor of recidivism in both the first and second block of the regression model (see Table 16). However, the interaction term was not

significant, demonstrating that gender did not moderate the relationship between the total need level and recidivism.

Table 16

Moderated Hierarchical Logistic Regression: DFIA Need Level Rating by Gender.

Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Total need level	0.89	0.08	123.05***	2.43	2.08 – 2.85
Gender	0.26	0.11	5.33*	1.30	1.04 – 1.62
Block 2					
Total need level	0.99	0.12	71.03***	2.68	2.13 – 3.37
Gender	0.68	0.37	3.25	1.96	0.94 – 4.09
Total need level x gender	-0.19	0.16	1.35	0.83	0.61 – 1.14
Nagelkerke R^2	0.13				
Model χ^2 (df = 3)	158.82***				

Note. N = 1530. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$

Summary of hypothesis 1 results. The findings of the ROC analyses and logistic regression analyses for the disaggregate sample converged with the findings of the hierarchical logistic regression for the aggregate sample. For each of the predictors in the disaggregate approach (complete total score, optimal total score, total need level), the AUC coefficients and odds ratios were similar for both males and females and the confidence intervals were found to overlap for both genders. This demonstrated no significant differences in the predictive validity of the predictor variables for males and

females. Similarly, in the hierarchical logistic regression analysis for the aggregate approach, the complete total score, optimal total score, and total need level were found to significantly predict recidivism. However, none of the interaction terms were found to be significant, indicating that gender did not moderate the relationship between the total scores and need level and recidivism. Thus, all of the analyses support hypothesis 1—that gender differences will not emerge when need domains are assessed globally.

Hypothesis 2 Results: DFIA Domain Level

Hypothesis 2 results: ROC analysis by gender.

ROC analysis results for the complete domain scores. Low to moderate predictive accuracy was identified for the seven complete domain scores through ROC analysis. The obtained AUC values for the complete domain scores ranged from .62 to .72 for the male offenders, and .62 to .74 for the female offenders (see Table 17). Additionally, the largest AUC coefficient of the complete domain scores for male offenders was .72 for the substance abuse domain, and the largest AUC coefficient for the female offenders was .74 for the substance abuse domain as well. Consist with the second hypothesis, the 95% confidence intervals were found to overlap for each of the complete domain scores between men and women, demonstrating no significant differences based on gender.

Table 17

Predictive Validity Results by Gender: ROC Results for Complete Domain Scores.

	Males (n = 765)			Females (n = 765)		
Complete Domain Score	*AUC*	*SE*	95% CI	*AUC*	*SE*	95% *CI*
Employment	0.63*	0.02	0.59 – 0.67	0.67*	0.02	0.63 – 0.71
Associates	0.63*	0.02	0.59 – 0.67	0.68*	0.02	0.64 – 0.72
Family	0.63*	0.02	0.59 – 0.67	0.62*	0.02	0.58 – 0.66
Substance	0.72*	0.02	0.68 – 0.76	0.74*	0.02	0.70 – 0.77
Community	0.63*	0.02	0.59 – 0.67	0.65*	0.02	0.61 – 0.69
Personal	0.62*	0.02	0.58 – 0.66	0.65*	0.02	0.61 – 0.69
Attitude	0.69*	0.02	0.65 – 0.72	0.67*	0.02	0.63 – 0.71

Note. AUC represents the Area Under Curve Coefficient. *SE* represents the standard error. *CI* represents the 95% confidence interval.
* $p < .01$.

ROC analysis results for the optimal domain scores. The predictive accuracy identified for the seven optimal domain scores ranged from low to moderate. For the optimal domain scores, the AUC values ranged from .63 to .72 for the male offenders, and .65 to .74 for the female offenders (see Table 18). Specifically, the optimal domain score demonstrating the largest AUC value was the substance abuse domain for the male offenders (.72) and the female offenders (.74). The 95% confidence intervals demonstrated an overlap between male and female offenders for each of the optimal domain scores, signifying no significant gender differences. This finding provided support for hypothesis two.

Table 18

Predictive Validity Results by Gender: ROC Results for Optimal Domain Scores.

	Males (n = 765)			Females (n = 765)		
Optimal Domain Score	*AUC*	*SE*	95% *CI*	*AUC*	*SE*	95% *CI*
Employment	0.68*	0.02	0.64 – 0.72	0.68*	0.02	0.64 – 0.72
Associates	0.66*	0.02	0.63 – 0.70	0.71*	0.02	0.67 – 0.75
Family	0.63*	0.02	0.59 – 0.67	0.65*	0.02	0.61 – 0.69
Substance	0.72*	0.02	0.68 – 0.76	0.74*	0.02	0.70 – 0.77
Community	0.65*	0.02	0.61 – 0.69	0.67*	0.02	0.63 – 0.71
Personal	0.64*	0.02	0.60 – 0.67	0.69*	0.02	0.65 – 0.72
Attitude	0.63*	0.02	0.59 – 0.67	0.68*	0.02	0.64 – 0.72

Note. AUC represents the Area Under Curve Coefficient. *SE* represents the standard error. *CI* represents the 95% confidence interval.
* $p < .001$.

ROC analysis results for the domain need levels. And finally, of all the domain level predictors, the domain need level ratings generally demonstrated the lowest predictive accuracy. For the seven domain need level ratings, the AUC values ranged from .56 to .69 for the male offenders, and .52 to .72 for the female offenders (see Table 19). Similar to the previous domain predictors, the largest AUC coefficient was obtained for the substance abuse domain for the male offenders (.69) and the female offenders (.72). Consistent with hypothesis 2, the 95% confidence intervals overlapped for the need level ratings between the male and female offenders, demonstrating no significant difference in the scores based on gender.

Table 19

Predictive Validity Results by Gender: ROC Results for Domain Need Level Ratings.

	Males (n = 765)			Females (n = 765)		
Domain Need Level	*AUC*	*SE*	95% *CI*	*AUC*	*SE*	95% *CI*
Employment	0.61**	0.02	0.57 – 0.65	0.55*	0.02	0.50 – 0.59
Associates	0.59**	0.02	0.55 – 0.63	0.60**	0.02	0.55 – 0.64
Family	0.60**	0.02	0.56 – 0.64	0.58*	0.02	0.53 – 0.62
Substance	0.69**	0.02	0.65 – 0.73	0.72**	0.02	0.68 – 0.76
Community	0.59**	0.02	0.55 – 0.63	0.52	0.02	0.48 – 0.57
Personal	0.56*	0.02	0.51 – 0.60	0.59**	0.02	0.54 – 0.63
Attitude	0.57*	0.02	0.53 – 0.61	0.57*	0.02	0.52 – 0.61

Note. AUC represents the Area Under Curve Coefficient. *SE* represents the standard error. *CI* represents the 95% confidence interval.
* $p < .05$ ** $p < .01$.

Hypothesis 2 results: Logistic regression analyses by gender.

Logistic regression results for the complete domain scores. The complete domain scores were found to demonstrate significant predictive capability for both the male and female offenders (see Table 20). The magnitude of the odds ratios obtained for the complete domain scores demonstrated a small to null effect, with the largest odds ratio identified for the associates domain for both the male (*OR* = 1.24) and female (*OR* =1.33) offenders. Additionally, as predicted in hypothesis 2, each of the 95% confidence intervals were found to overlap for the male and female offenders, indicating no significant differences in predictive validity based on gender.

Table 20

Predictive Validity Results by Gender: Logistic Regression Results for Complete Domain Scores.

	Males (n = 765)			Females (n = 765)		
Complete Domain Score	Wald	Odds Ratio	95% *CI*	Wald	Odds Ratio	95% *CI*
Employment	35.83*	1.09	1.06 – 1.12	51.84*	1.14	1.10 – 1.18
Associates	37.57*	1.24	1.16 – 1.32	59.29*	1.33	1.24 – 1.43
Family	34.78*	1.13	1.08 – 1.17	28.11*	1.10	1.06 – 1.14
Substance	99.06*	1.10	1.08 – 1.12	105.51*	1.10	1.08 – 1.11
Community	37.72*	1.21	1.14 – 1.29	46.59*	1.30	1.20 – 1.40
Personal	33.91*	1.07	1.05 – 1.10	34.21*	1.08	1.05 – 1.10
Attitude	64.84*	1.18	1.13 – 1.22	44.35*	1.20	1.14 – 1.37

Note. Employment, family, and substance domain scores are based on pro-rated values. Wald represents the Wald chi-square test. *CI* represents 95% confidence interval.
* $p < .001$

Logistic regression results for the optimal domain scores. Each of the optimal domain scores were found to significantly predict recidivism for both men and women. Additionally, all of the odds ratios obtained for the optimal domain scores demonstrated a small to null effect (see Table 21). Only the odds ratios for the optimal domain scores for the associates domain for both men and women, and the community functioning domain for women reached the 1.40 value for a small effect. Similar to the complete domain scores, the optimal domain score with the largest odds ratio was the associates domain for the male (OR = 1.48) and female (OR = 1.59) offenders. However, the 95% confidence intervals for each of the optimal domain scores were found to overlap between the men and women, providing support for hypothesis two.

Table 21

Predictive Validity Results by Gender: Logistic Regression Results for Optimal Domain Scores.

	Males (n = 765)			Females (n = 765)		
Optimal Domain Score	Wald	Odds Ratio	95% *CI*	Wald	Odds Ratio	95% *CI*
Employment	67.58*	1.25	1.18 – 1.32	59.02*	1.18	1.13 – 1.23
Associates	59.11*	1.48	1.34 – 1.64	81.99*	1.59	1.44 – 1.75
Family	37.82*	1.20	1.13 – 1.27	44.99*	1.18	1.13 – 1.24
Substance	99.06*	1.10	1.08 – 1.12	105.51*	1.10	1.08 – 1.11
Community	48.53*	1.31	1.21 – 1.41	59.68*	1.40	1.28 – 1.52
Personal	40.41*	1.11	1.07 – 1.14	52.33*	1.14	1.10 – 1.18
Attitude	37.82*	1.20	1.13 – 1.27	45.86*	1.21	1.15 – 1.28

Note. Employment, family, and substance domain scores are based on pro-rated values. Wald represents the Wald chi-square test. *CI* represents 95% confidence interval.
* $p < .001$

Logistic regression results for the domain need levels. In contrast to what was found in the ROC analysis, the odds ratios obtained for the domain need levels were actually larger than the odds ratios obtained for the complete domain scores and optimal domain scores. The magnitude of the domain need level ratings as predictors of recidivism ranged from a small effect to a moderate effect (see Table 22). The magnitude of the odds ratios ranged from 1.32 to 2.36 for the male offenders and 1.22 to 2.73 for the female offenders. The largest odds ratio demonstrating a moderate effect was identified for the substance abuse domain need level for both the men (*OR* = 2.36) and women (*OR* = 2.73). The findings provided support for hypothesis 2 as either the magnitude of the effect for the domain need level ratings were the same for men and women or the 95% confidence intervals demonstrated an overlap.

Table 22

Predictive Validity Results by Gender: Logistic Regression Results for Domain Need Level Ratings.

	Males (n = 765)			Females (n = 765)		
Domain Need Level	Wald	Odds Ratio	95% *CI*	Wald	Odds Ratio	95% *CI*
Employment	29.44***	1.58	1.34 – 1.86	4.74*	1.26	1.02 – 1.55
Associates	19.84***	1.44	1.23 – 1.69	23.71***	1.65	1.21 – 1.74
Family	22.35***	1.48	1.26 – 1.74	16.29***	1.45	0.97 – 1.53
Substance	85.20***	2.36	1.97 – 2.83	104.29***	2.73	1.19 – 1.77
Community	22.74***	1.58	1.31 – 1.91	2.99	1.22	1.02 – 1.55
Personal	8.00**	1.34	1.09 – 1.64	17.71***	1.64	1.21 – 1.74
Attitude	12.70***	1.32	1.13 – 1.54	13.24***	1.45	0.97 – 1.53

Note. Wald represents the Wald chi-square test. *CI* represents 95% confidence interval.
* $p < .05$ ** $p < .01$ *** $p < .001$

Hypothesis 2 results: Moderated logistic regression results for combined sample.

Moderated logistic regression results for the complete domain scores. In sum, the results of seven, individual hierarchical logistic regressions failed to identify any significant interactions between gender and any of the individual seven complete domain scores (Tables 23 to 29). For example, as Table 23 demonstrates, the employment complete domain score was a significant predictor of recidivism in the first and second block, but was not significant in the interaction term with gender. The non-significant interaction term was also observed for each of the remaining complete domain scores (see Tables 24 to 29), providing support for hypothesis 2.

Table 23

Moderated Hierarchical Logistic Regression: Employment Complete Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Employment complete domain score	0.10	0.01	85.34***	1.11	1.09 – 1.13
Gender	0.40	0.11	13.52***	1.50	1.21 – 1.86
Block 2					
Employment complete domain score	0.13	0.02	51.84***	1.14	1.10 – 1.18
Gender	0.83	0.27	9.82**	2.30	1.37 – 3.86
Employment complete domain score x gender	-0.04	0.02	3.15	0.96	0.92 – 1.00
Nagelkerke R^2	0.10				
Model χ^2 ($df = 3$)	116.72***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 24

Moderated Hierarchical Logistic Regression: Associates Complete Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Associates complete domain score	0.25	0.03	96.18***	1.28	1.22 – 1.35
Gender	0.49	0.11	20.04***	1.64	1.32 – 2.03
Block 2					
Associates complete domain score	0.29	0.04	59.29***	1.33	1.24 – 1.43
Gender	0.78	0.23	11.95**	2.19	1.40 – 3.41
Associates complete domain score x gender	-0.08	0.05	2.17	0.93	0.84 – 1.03
Nagelkerke R^2	0.11				
Model χ^2 (df = 3)	126.57***				

Note. N = 1530. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 25

Moderated Hierarchical Logistic Regression: Marital/Family Complete Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Marital complete domain score	0.11	0.01	62.43***	1.11	1.08 – 1.14
Gender	0.62	0.11	31.96***	1.87	1.50 – 2.32

Table 25 (continued).

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 2					
Marital complete domain score	0.10	0.02	28.11***	1.10	1.06 – 1.14
Gender	0.47	0.24	3.89*	1.60	1.00 – 1.14
Marital complete domain score x gender	0.02	0.03	0.55	1.02	0.97 – 1.08
Nagelkerke R^2	0.08				
Model χ^2 (df = 3)	87.13***				

Note. N = 1530. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 26

Moderated Hierarchical Logistic Regression: Substance Abuse Complete Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Substance complete domain score	0.09	0.01	204.43***	1.10	1.08 – 1.11
Gender	0.42	0.12	13.48***	1.53	1.22 – 1.92
Block 2					
Substance complete domain score	0.09	0.01	105.51***	1.10	1.08 – 1.11
Gender	0.37	0.23	2.73	1.45	0.93 – 2.27
Substance complete domain score x gender	0.00	0.01	0.07	1.00	0.98 – 1.03
Nagelkerke R^2	0.22				
Model χ^2 (df = 3)	264.68***				

Table 26 (continued).

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 27

Moderated Hierarchical Logistic Regression: Community Functioning Complete Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Community complete domain score	0.22	0.02	82.87***	1.25	1.19 – 1.31
Gender	0.45	0.11	16.94***	1.57	1.27 – 1.94
Block 2					
Community complete domain score	0.26	0.04	46.59***	1.30	1.20 – 1.40
Gender	0.79	0.28	8.27**	2.21	1.29 – 3.79
Community complete domain score x gender	-0.07	0.05	1.84	0.94	0.85 – 1.03
Nagelkerke R^2	0.10				
Model χ^2 ($df = 3$)	112.66***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 28

Moderated Hierarchical Logistic Regression: Personal/Emotional Complete Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Personal complete domain score	0.07	0.01	68.05***	1.08	1.06 – 1.09
Gender	0.33	0.11	9.06**	1.39	1.12 – 1.73
Block 2					
Personal complete domain score	0.07	0.01	34.21***	1.08	1.05 – 1.10
Gender	0.38	0.22	2.95	1.46	0.95 – 2.25
Personal complete domain score x gender	-0.00	0.02	0.06	1.00	0.96 – 1.03
Nagelkerke R^2	0.08				
Model χ^2 ($df = 3$)	93.05***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 29

Moderated Hierarchical Logistic Regression: Attitude Complete Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Attitude complete domain score	0.17	0.02	108.77***	1.18	1.15 – 1.22
Gender	0.03	0.12	0.05	1.03	0.81 – 1.30

Table 29 (continued)

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 2					
Attitude complete domain score	0.18	0.03	44.35***	1.20	1.14 – 1.27
Gender	0.10	0.16	0.35	1.10	0.80 – 1.51
Attitude complete domain score x gender	-0.02	0.03	0.39	0.98	0.92 – 1.05
Nagelkerke R^2	0.12				
Model χ^2 ($df = 3$)	143.18***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Moderated logistic regression results for the optimal domain scores. Upon examination of the results of the seven hierarchical logistic regression analyses for each of the optimal domain scores (see Tables 30 to 36), one interaction term was found to be significant. The employment optimal domain score was found to significantly interact with gender with an odds ratio of 0.94 (see Table 30). When examined separately, a larger effect size for the employment optimal domain score was identified for female offenders (Wald = 61.32, $p < .001$, Odds Ratio = 1.19, 95% *CI* = 1.14 to 1.24) compared to male offenders (Wald = 37.23, $p < .001$, Odds Ratio = 1.12, 95% *CI* = 1.08 to 1.16). Additionally, a visual interpretation of the graph suggests that for females who obtain a particularly high score for the optimal employment domain score, the increase in the probability of recidivism is greater than for men who obtain similar scores for the optimal employment domain. However, when the upper limit of the 95% confidence interval for

the employment optimal domain score was rounded to two decimal places, the confidence interval for the interaction term contained the value of 1. Therefore, it is possible that this interaction term was identified as significant merely by chance.

Of the remaining optimal domain scores (associates, marital/family, substance abuse, community functioning, personal/emotional, attitude), none of the interaction terms were identified as significant. Thus, gender was not found to moderate the relationship between the remaining optimal domain scores and recidivism. These findings were consistent with hypothesis 2.

Table 30

Moderated Hierarchical Logistic Regression: Employment Optimal Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Employment optimal domain score	0.14	0.01	96.04***	1.15	1.12 – 1.18
Gender	0.40	0.11	13.38***	1.50	1.21 – 1.86
Block 2					
Employment optimal domain score	0.17	0.02	61.32***	1.19	1.14 – 1.24
Gender	0.82	0.23	12.34***	2.26	1.43 – 3.56
Employment optimal domain score x gender	-0.06	0.03	4.10*	0.94	0.89 – 1.00
Nagelkerke R^2	0.11				
Model χ^2 ($df = 3$)	129.17***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 31

Moderated Hierarchical Logistic Regression: Associates Optimal Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Associates optimal domain score	0.40	0.04	132.72***	1.49	1.39 – 1.60
Gender	0.40	0.11	12.75***	1.49	1.20 – 1.85
Block 2					
Associates optimal domain score	0.46	0.05	81.99***	1.59	1.44 – 1.75
Gender	0.71	0.22	10.79**	2.03	1.33 – 3.10
Associates optimal domain score x gender	-0.12	0.07	2.84	2.03	0.78 – 1.02
Nagelkerke R^2	0.14				
Model χ^2 (df = 3)	170.43***				

Note. N = 1530. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 32

Moderated Hierarchical Logistic Regression: Marital/Family Optimal Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Marital/Family optimal domain score	0.14	0.02	71.78***	1.15	1.11 – 1.18
Gender	0.57	0.11	27.19***	1.77	1.43 – 2.20

Table 32 (continued).

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 2					
Marital/Family optimal domain score	0.12	0.02	30.62***	1.13	1.08 – 1.18
Gender	0.42	0.21	3.82	1.51	1.00 – 2.30
Marital/Family optimal domain score x gender	0.03	0.03	0.74	0.39	0.97 – 1.10
Nagelkerke R^2	0.08				
Model χ^2 ($df = 3$)	97.46***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 33

Moderated Hierarchical Logistic Regression: Substance Abuse Optimal Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Substance optimal domain score	0.09	0.01	204.43***	1.10	1.08 – 1.11
Gender	0.42	0.12	13.48***	1.53	1.22 – 1.92
Block 2					
Substance optimal domain score	0.09	0.01	105.51***	1.10	1.08 – 1.11
Gender	0.37	0.23	2.73	1.45	0.93 – 2.27
Substance optimal domain score x gender	0.00	0.01	0.07	1.00	0.98 – 1.03
Nagelkerke R^2	0.22				
Model χ^2 ($df = 3$)	264.68***				

Table 33 (continued).

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 34

Moderated Hierarchical Logistic Regression: Community Functioning Optimal Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Community optimal domain score	0.27	0.03	99.59***	1.31	1.24 – 1.38
Gender	0.44	0.11	15.91***	1.55	1.25 – 1.93
Block 2					
Community optimal domain score	0.33	0.04	59.68***	1.40	1.28 – 1.52
Gender	0.90	0.26	11.74**	2.46	1.47 – 4.11
Community optimal domain score x gender	-0.11	0.06	3.78	0.90	0.81 – 1.00
Nagelkerke R^2	0.11				
Model χ^2 ($df = 3$)	133.89***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 35

Moderated Hierarchical Logistic Regression: Personal/Emotional Optimal Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Personal optimal domain score	0.10	0.01	90.11***	1.11	1.08 – 1.13
Gender	0.26	0.11	5.49*	1.30	1.04 – 1.62
Block 2					
Personal optimal domain score	0.11	0.02	48.62***	1.12	1.08 – 1.15
Gender	0.42	0.22	3.77	1.52	1.00 – 2.32
Personal optimal domain score x gender	-0.02	0.02	0.72	0.98	0.94 – 1.02
Nagelkerke R^2	0.10				
Model χ^2 ($df = 3$)	118.47***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 36

Moderated Hierarchical Logistic Regression: Attitude Optimal Domain Score by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Attitude optimal domain score	0.17	0.02	108.77***	1.18	1.15 – 1.22
Gender	0.03	0.12	0.05	1.03	0.81 – 1.30
Block 2					
Attitude optimal domain score	0.18	0.03	44.35***	1.20	1.14 – 1.27
Gender	0.10	0.16	0.35	1.10	0.80 – 1.51
Attitude optimal domain score x gender	-0.02	0.03	0.39	0.98	0.92 – 1.05
Nagelkerke R^2	0.12				
Model χ^2 ($df = 3$)	143.18***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

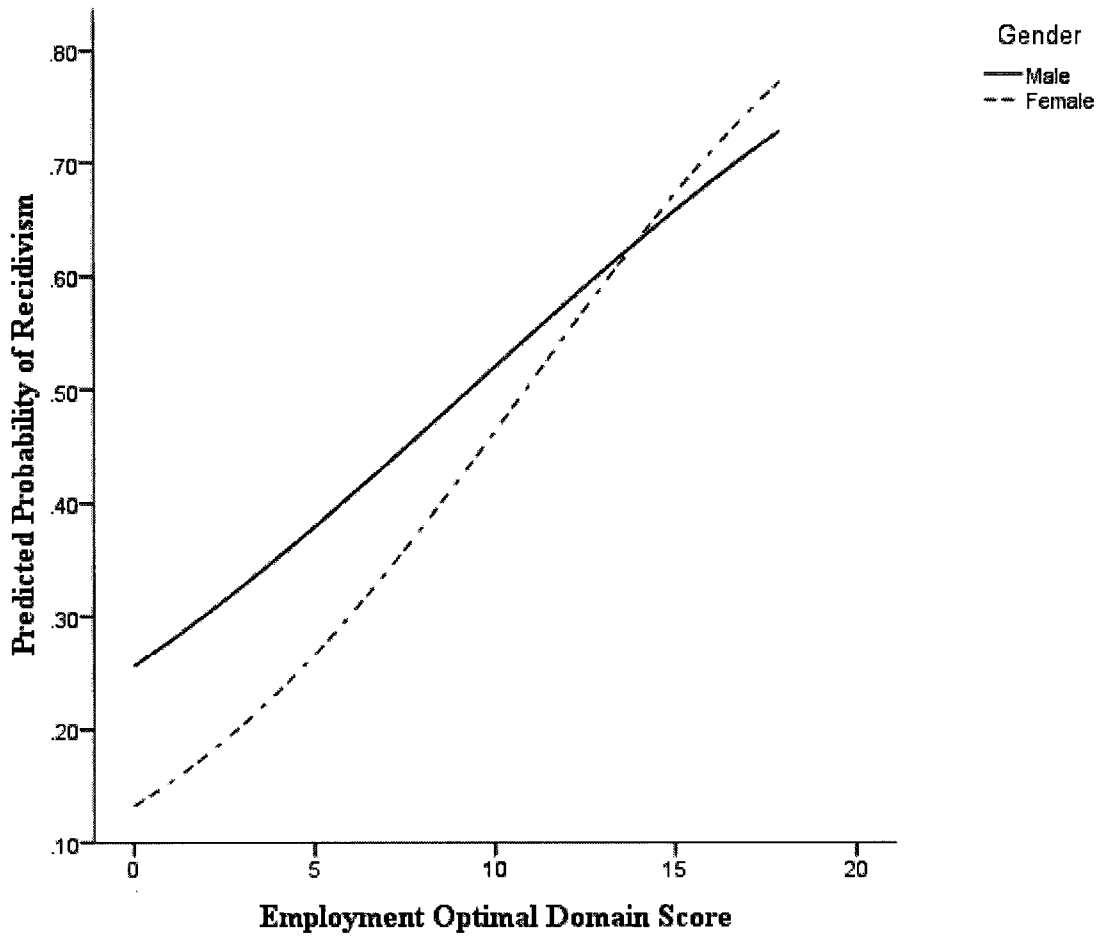

Figure 1

Moderating Effect of Gender on the Employment Optimal Domain Score.

Moderated logistic regression results for the domain need levels. Overall, the results of the hierarchical logistic regression analyses for the seven domain need levels failed to identify any significant interactions between any of the domain need level ratings and gender (Tables 37 to 43). Each of the domain need levels were significant predictors of recidivism in the first and second block of each hierarchical logistic

regression analysis. However, none of the interaction terms between the domain need levels and gender were significant, thus providing support for hypothesis 2.

Table 37

Moderated Hierarchical Logistic Regression: Employment Domain Need Level by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Employment domain need level	0.37	0.07	31.84***	1.45	1.28 – 1.65
Gender	0.54	0.11	25.16***	1.72	1.39 – 2.12
Block 2					
Employment domain need level	0.23	0.11	4.74*	1.26	1.02 – 1.55
Gender	-0.12	0.41	0.09	0.89	0.40 – 1.98
Employment domain need level x gender	0.23	0.14	2.79	1.25	0.96 – 1.64
Nagelkerke R^2	0.05				
Model χ^2 (df = 3)	57.28***				

Note. N = 1530. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 38

Moderated Hierarchical Logistic Regression: Associates Domain Need Level by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Associates domain need level	0.42	0.06	42.78***	1.52	1.34 – 1.72
Gender	0.46	0.11	18.54***	1.59	1.29 – 1.96
Block 2					
Associates domain need level	0.50	0.10	23.71***	1.65	1.35 – 2.01
Gender	0.84	0.39	4.65*	2.32	1.08 – 4.98
Associates domain need level x gender	-0.13	0.13	1.01	0.88	0.68 – 1.13
Nagelkerke R^2	0.06				
Model χ^2 ($df = 3$)	67.22***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 39

Moderated Hierarchical Logistic Regression: Marital/Family Domain Need Level by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Marital/Family domain need level	0.38	0.06	38.61***	1.47	1.30 – 1.65
Gender	0.61	0.11	30.55***	1.83	1.48 – 2.27

Table 39 (continued).

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 2					
Marital/Family domain need level	0.37	0.09	16.29***	1.45	1.21 – 1.74
Gender	0.56	0.36	2.40	1.74	0.86 – 3.53
Marital/Family domain need level x Gender	0.02	0.12	0.02	1.02	0.80 – 1.30
Nagelkerke R^2	0.05				
Model χ^2 ($df = 3$)	61.55***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 40

Moderated Hierarchical Logistic Regression: Substance Abuse Domain Need Level by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Substance domain need level	0.93	0.07	189.47***	2.53	2.22 – 2.89
Gender	0.41	0.11	12.99***	1.51	1.21 – 1.89
Block 2					
Substance domain need level	1.00	0.10	104.29***	2.73	2.25 – 3.31
Gender	0.89	0.46	3.74	2.44	0.99 – 6.01
Substance domain need level x gender	-0.15	0.14	1.16	0.87	0.66 – 1.13
Nagelkerke R^2	0.20				
Model χ^2 ($df = 3$)	238.86***				

Table 40 (continued).

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 41

Moderated Hierarchical Logistic Regression: Community Functioning Domain Need Level by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Community domain need level	0.36	0.07	23.15***	1.43	1.23 – 1.65
Gender	0.51	0.11	22.61***	1.66	1.35 – 2.05
Block 2					
Community domain need level	0.20	0.12	2.99	1.22	0.97 – 1.53
Gender	-0.16	0.40	0.15	0.86	0.39 – 1.88
Community domain need level x gender	0.26	0.15	2.95	1.29	0.96 – 1.74
Nagelkerke R^2	0.04				
Model χ^2 ($df = 3$)	48.20***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 42

Moderated Hierarchical Logistic Regression: Personal/Emotional Domain Need Level by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Personal domain need level	0.38	0.08	24.23***	1.46	1.26 – 1.71
Gender	0.42	0.11	15.22***	1.52	1.23 – 1.88
Block 2					
Personal domain need level	0.49	0.12	17.71***	1.64	1.30 – 2.06
Gender	1.08	0.53	4.21*	2.96	1.05 – 8.32
Personal domain need level x gender	-0.20	0.16	1.65	0.82	0.60 – 1.11
Nagelkerke R^2	0.04				
Model χ^2 ($df = 3$)	48.02***				

Note. $N = 1530$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 43

Moderated Hierarchical Logistic Regression: Attitude Domain Need Level by Gender.

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Attitude domain need level	0.31	0.06	25.37***	1.37	1.21 – 1.54
Gender	0.32	0.11	7.85**	1.37	1.10 – 1.71

Table 43 (continued).

Predictor Variable	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 2					
Attitude domain need level	0.37	0.10	13.24***	1.45	1.19 – 1.77
Gender	0.54	0.32	2.78	1.71	0.91 – 3.21
Attitude domain need level x gender	-0.09	0.13	0.54	0.91	0.71 – 1.17
Nagelkerke R^2	0.04				
Model χ^2 (df = 3)	47.77***				

Note. N = 1530. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Summary of hypothesis 2 results. The findings of the disaggregate approach through the ROC analyses and logistic regression analyses generally converged with the findings of the hierarchical logistic regression for the combined sample. Each of the complete domain scores, optimal domain scores, and domain need level ratings were generally found to be significant predictors of recidivism. More importantly, the results primarily demonstrated that the predictive validity of the domain level of the DFIA did not vary based on gender. With the exception of the employment optimal domain score, the remaining complete domain scores, optimal domain scores, and domain need level ratings were not found to significantly interact with gender. Thus, support was provided for hypothesis 2, demonstrating that when need domains are assessed globally, gender differences will not emerge.

Hypothesis 3 Results: DFIA Indicator Level

Hypothesis 3 results: Logistic regression analyses by gender. All 158 DFIA indicators included in the present study were the focus of the analyses for the third hypothesis. First, 158 individual logistic regression analyses were conducted using each indicator as a predictor and recidivism as the outcome measure. For example, the employment domain indicator 'has no employment history' was entered into a logistic regression model with recidivism as the outcome variable. This was conducted for every one of the DFIA indicators. Additionally, each logistic analysis was preformed first for the male offender sample, and then again separately for the female offender sample. Thus, in total, 316 individual logistic regression analyses were conducted, generating 158 odds ratios corresponding to each of the indicators for males, and 158 corresponding odds ratios for females. The odds ratio associated with each indicator was identified as either small (1.4 – 2.2; reciprocal: 0.71 – 0.42), moderate (2.3 – 3.6; reciprocal: 0.43 - 0.28), or large (3.7+; reciprocal: 0.27 – 0).

The odds ratios generated through the logistic regression analyses for each of the indicators are presented in Tables 43 to 49. Of the 158 indicators, 129 (82%) were found to significantly predict recidivism for men, women, or both. The magnitude of the odds ratios for the significant indicators was evaluated to identify those which were gender neutral predictors (predictive for both genders and same magnitude for males and females), gender salient (predictive for both genders and different magnitude for male and female offenders), and gender specific (predictive for one gender but not at all for the other). Of these significantly predictive indicators, 52 (40%) were identified as gender

neutral, 5 (4%) were identified as male salient, 35 (27%) were identified as female salient, 9 (7%) were identified as male specific, and 28 (22%) were female specific.

Logistic regression results for the employment domain indicators. Twenty-nine employment indicators were examined through logistic regression and 20 (69%) were found to significantly predict recidivism for males, females, or both genders (see Table 44). More specifically, 11 (38%) of the employment indicators were significantly predictive of recidivism for men and 19 (66%) were significantly predictive for women. With regard to the magnitude of the effect for the significant employment indicators, the odds ratios ranged from 1.41 to 3.16 for the male offenders, and 1.66 to 3.37 for female offenders. Additionally, for the significant employment indicators, 8 (40%) were identified as gender neutral predictors, 1 (5%) was identified as male specific, 9 (45%) were identified as female specific, 2 (10%) were identified as female salient, and there were no male salient employment indicators.

Table 44

Predictive Validity of Employment Domain Indicators by Gender

	Men (n = 765)[a]		Women (n = 765)[b]		
Employment Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[c]
Has less than grade 8?	1.14	0.82 – 1.57	2.05***	1.39 – 3.03	F Specific
Has less than grade 10?	1.41*	1.06 – 1.89	2.23***	1.64 – 3.04	Neutral
Has no high school diploma?	1.31	0.91 – 1.89	1.69**	1.19 – 2.39	F Specific
Finds learning difficult?	1.26	0.92 – 1.74	2.06***	1.40 – 3.04	F Specific

Table 44 (continued).

	Men (n = 765)[a]		Women (n = 765)[b]		
Employment Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[c]
Has learning disabilities?	1.34	0.90 – 1.98	1.72*	1.01 – 2.94	F Specific
Has memory problems?	1.38	0.97 – 1.97	1.72**	1.16 – 2.56	F Specific
Has concentration problems?	1.83***	1.33 – 2.51	2.26***	1.58 – 3.22	F Salient
Has problems with reading?	1.07	0.78 – 1.45	1.66*	1.01 – 2.72	F Specific
Has problems with writing?	1.08	0.80 – 1.46	1.94**	1.18 – 3.17	F Specific
Has problems with numeracy?	1.11	0.83 – 1.48	1.71**	1.17 – 2.49	F Specific
Has difficulty understanding instructions?	1.18	0.74 – 1.87	1.54	0.92 – 2.59	n.s.
Lacks a skill area/trade/profession?	1.82***	1.36 – 2.43	1.98***	1.44 – 2.74	Neutral
Dissatisfied with skill area/trade/profession?	1.68***	1.26 – 2.25	1.78***	1.31 – 2.42	Neutral
Physical problems that interfere with work?	1.18	0.79 – 1.76	1.46	0.96 – 2.22	n.s.
Has no employment history?	3.01***	1.77 – 5.10	2.74***	1.88 – 4.00	Neutral
Unemployed at the time of arrest?	3.16***	2.30 – 4.34	3.29***	2.15 – 5.03	Neutral
Unemployed 90% or more?	2.83***	2.03 – 3.95	2.82***	2.06 – 3.85	Neutral
Unemployed 50% or more?	3.08***	2.28 – 4.15	2.82***	1.97 – 4.04	Neutral
Has an unstable job history?	2.45***	1.77 – 3.38	3.37***	2.29 – 4.95	Neutral
Lacks initiative?	2.20***	1.56 – 3.10	2.77**	1.49 – 5.14	F Salient
Has quit a job without another?	1.09	0.82 – 1.46	1.20	0.88 – 1.64	n.s.
Has been laid off from work?	0.95	0.71 – 1.26	0.79	0.56 – 1.13	n.s.

Table 44 (continued).

	Men (n = 765)[a]		Women (n = 765)[b]		
Employment Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[c]
Has been fired from a job?	1.03	0.74 – 1.43	0.75	0.50 – 1.15	n.s.
Salary has been insufficient?	1.23	0.92 – 1.64	0.97	0.71 – 1.32	n.s.
Lacks employment benefits?	1.47**	1.10 – 1.96	0.74	0.55 – 1.01	M Specific
Job lacks security?	1.31	0.98 – 1.75	0.69*	0.51 – 0.94	F Specific
Prior vocational assessment(s)?	1.39	0.87 – 2.21	1.10	0.71 – 1.71	n.s.
Has participated in employment programs?	1.02	0.73 – 1.42	0.81	0.58 – 1.15	n.s.
Completed occupational development program?	0.64	0.40 – 1.01	0.75	0.50 – 1.12	n.s.

Note. [a] Male sample size for indicators 'has an unstable job history' and 'lacks initiative' (n = 696). [b] Female sample size for indicators 'has an unstable job history' and 'lacks initiative' (n = 628). [c] Male/female predictors are identified as Neutral (gender neutral), F Salient (female salient), M Salient (male salient), F Specific (female specific), M Specific (male specific), and n.s. (not significant). Odds ratios are identified as small (1.4 – 2.2; reciprocal: .71 – .42), moderate (2.3 – 3.6; reciprocal: .43 - .28), and large (3.7+; reciprocal: .27 – 0).
* $p < .05$ ** $p < .01$ *** $p < .001$.

Logistic regression results for the associates domain indicators. For the associates indicators, 11 were examined through logistic regression and 6 (55%) were found to significantly predict recidivism for males, females, or both genders (see Table 45). In particular, 5 (45%) of the associates indicators were significantly predictive of recidivism for men and 6 (55%) were significantly predictive for women. The odds

ratios for the significant associates indicators ranged from 1.40 to 3.07 for the male offenders, and 1.79 to 3.99 for female offenders. Additionally, for the significant associates indicators, 2 (33%) were identified as gender neutral predictors, 3 (50%) were identified as female salient predictors, and 1 (16%) was identified as female specific. None of the associates indicators emerged as male salient or specific predictors of recidivism.

Table 45

Predictive Validity of Associates Domain Indicators by Gender

	Men (n = 765)		Women (n = 765)		
Associates Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Social isolated?	1.33	0.92 – 1.91	1.00	0.71 – 1.42	n.s
Associates with substance abusers?	2.99***	2.15 – 4.15	3.99***	2.81 – 5.67	F Salient
Has many criminal acquaintances?	3.07***	2.24 – 4.20	2.81***	2.04 – 3.86	Neutral
Has mostly criminal friends?	2.77***	2.04 – 3.77	3.70***	2.63 – 5.20	F Salient
Has been affiliated with a gang?	0.91	0.57 – 1.45	1.29	0.72 – 2.29	n.s.
Resides in a criminogenic area?	1.84**	1.30 – 2.60	2.40***	1.74 – 3.32	F Salient
Unattached to any community groups?	1.40*	1.05 – 1.88	2.07***	1.52 – 2.82	Neutral
Relations are described as predatory?	1.08	0.73 – 1.59	1.79*	1.08 – 2.97	F Specific
Often victimized in social relations?	1.06	0.72 – 1.56	1.22	0.88 – 1.69	n.s.
Easily influenced by others?	1.26	0.95 – 1.68	1.18	0.87 – 1.60	n.s.
Has difficulty communicating with others?	1.16	0.81 – 1.65	1.37	0.96 – 1.95	n.s.

Table 45 (continued).

Note. [a] Male/female predictors are identified as Neutral (gender neutral), F Salient (female salient), M Salient (male salient), F Specific (female specific), M Specific (male specific), and n.s. (not significant). Odds ratios are identified as small (1.4 – 2.2; reciprocal: .71 – .42), moderate (2.3 – 3.6; reciprocal: .43 - .28), and large (3.7+; reciprocal: .27 – 0).
* $p < .05$ ** $p < .01$ *** $p < .001$.

Logistic regression results for the marital/family domain indicators. Twenty-four marital/family indicators were examined through logistic regression and 18 (75%) were found to significantly predict recidivism for males, females, or both genders (see Table 46). Of the marital/family indicators significantly predictive of recidivism, 11 (46%) were significant for men and 15 (63%) were significant for women. With regard to the magnitude of the effect for the significant marital/family indicators, the odds ratios ranged from 1.45 to 2.00 for the male offenders, and 1.40 to 2.46 for female offenders. Additionally, for the significant marital/family indicators, 8 (44%) were identified as gender neutral predictors, 3 (17%) were identified as male specific, and 7 (39%) were identified as female specific. None of the marital/family indicators were found to predict recidivism saliently for the male or female offenders.

Table 46

Predictive Validity of Marital/Family Domain Indicators by Gender

	Men (n = 765)		Women (n = 765)		
Marital/Family Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Childhood lacked family ties?	1.67**	1.19 – 2.34	1.77**	1.26 – 2.47	Neutral
Mother absent during childhood?	1.62*	1.11 – 2.36	1.35	0.94 – 1.92	M Specific
Maternal relations negative as a child?	1.45*	1.01 – 2.09	1.98***	1.44 – 2.74	Neutral
Father absent during childhood?	1.81***	1.34 – 2.44	1.08	0.79 – 1.46	M Specific
Paternal relations negative as a child?	1.81***	1.34 – 2.44	1.40*	1.03 – 1.91	Neutral
Parent's relationship dysfunctional during childhood?	1.85***	1.39 – 2.48	1.61**	1.19 – 2.19	Neutral
Spousal abuse during childhood?	1.85***	1.35 – 2.55	1.67**	1.21 – 2.29	Neutral
Sibling relations negative during childhood?	1.01	0.63 – 1.62	0.95	0.63 – 1.43	n.s.
Other relative relations negative in childhood?	1.44	0.88 – 2.35	1.89**	1.30 – 2.76	F Specific
Family members involved in crime?	2.00***	1.48 – 2.69	2.01***	1.48 – 2.73	Neutral
Currently single?	1.95***	1.45 – 2.63	0.84	0.62 – 1.15	M Specific
Has been married/common-law in the past?	0.86	0.60 – 1.22	1.72*	1.13 – 2.62	F Specific
Dissatisfied with current relationship?	1.26	0.81 – 1.94	0.84	0.52 – 1.34	n.s.
Money problems affect relationship(s)?	1.35	0.98 – 1.84	1.28	0.93 – 1.76	n.s.
Sexual problem affect relationship(s)?	0.54*	0.32 – 0.92	1.82**	1.20 – 2.76	Neutral
Communication problems affect the relationship(s)?	1.24	0.92 – 1.66	1.16	0.86 – 1.58	n.s.

Table 46 (continued).

	Men (n = 765)		Women (n = 765)		
Marital/Family Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Has been a victim of spousal abuse?	1.35	0.85 – 2.15	1.75*	1.29 – 2.38	F Specific
Has been a perpetrator of spousal abuse?	1.45*	1.04 – 2.01	2.15***	1.43 – 3.24	Neutral
Has no parenting responsibilities?	1.20	0.90 – 1.60	1.28	0.94 – 1.74	n.s.
Unable to handle parenting responsibilities?	1.19	0.78 – 1.80	2.46***	1.69 – 3.58	F Specific
Lacks an understanding of child development?	1.06	0.67 – 1.67	2.32**	1.38 – 3.90	F Specific
Family is unable to get along as a unit?	1.19	0.85 – 1.65	1.87**	1.26 – 2.78	F Specific
Prior marital/family assessment(s)?	1.59	0.85 – 2.96	1.62*	1.04 – 2.51	F Specific
Has participated in marital/family therapy?	1.06	0.61 – 1.86	1.03	0.64 – 1.65	n.s.

Note. [a] Male/female predictors are identified as Neutral (gender neutral), F Salient (female salient), M Salient (male salient), F Specific (female specific), M Specific (male specific), and n.s. (not significant). Odds ratios are identified as small (1.4 – 2.2; reciprocal: .71 – .42), moderate (2.3 – 3.6; reciprocal: .43 - .28), and large (3.7+; reciprocal: .27 – 0).
* $p < .05$ ** $p < .01$ *** $p < .001$.

Logistic regression results for the substance abuse domain indicators. Logistic regression analyses revealed that all of the 29 (100%) substance abuse indicators were significantly predictive of recidivism (see Table 47). Additionally, when looking at men and women separately, all 29 of the substance abuse indicators were significant predictors of recidivism for both genders. The magnitude of the odds ratios for the indicators ranged from 1.74 to 4.54 for the male offenders and 1.99 to 5.01 for female

offenders. Additionally, of the substance abuse indicators, 12 (41%) were identified as gender neutral predictors, 2 were identified as male salient predictors (7%), 15 (52%) were female salient predictors, and none of the substance abuse indicators were found to predict recidivism specifically for male or female offenders.

Table 47

Predictive Validity of Substance Abuse Domain Indicators by Gender

	Men (n = 765)		Women (n = 765)		
Substance Abuse Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Abuses alcohol?	2.13***	1.58 – 2.86	2.54***	1.86 – 3.48	F Salient
Began drinking at an early age?	2.77***	2.06 – 3.73	2.50***	1.80 – 3.46	Neutral
Drinks on a regular basis?	2.37***	1.76 – 3.18	2.60***	1.82 – 3.69	Neutral
Has history of drinking binges?	1.98***	1.48 – 2.64	2.40***	1.74 – 3.33	F Salient
Has combined the use of alcohol and drugs?	2.90***	2.15 – 3.92	2.74***	1.98 – 3.80	Neutral
Drinks to excess during leisure time?	2.27***	1.69 – 3.04	2.04***	1.46 – 2.84	M Salient
Drinks to excess in social situations?	2.43***	1.81 – 3.25	1.99***	1.44 – 2.76	M Salient
Drinks to relieve stress?	2.13***	1.58 – 2.87	2.10***	1.51 – 2.92	Neutral
Drinking interferes with employment?	2.05***	1.45 – 2.90	3.13***	2.05 – 4.79	F Salient
Drinking interferes with marital/family relations?	1.78***	1.32 – 2.41	2.47***	1.77 – 3.45	F Salient
Drinking interferes with social relations?	1.74**	1.26 – 2.38	2.36***	1.64 – 3.42	F Salient
Drinking has resulted in law violations?	2.10***	1.57 – 2.81	2.39***	1.72 – 3.31	F Salient
Drinking interferes with health?	1.85**	1.26 – 2.71	2.02**	1.36 – 3.00	Neutral
Abuses drugs (solvents, prescription, etc.)?	3.51***	2.56 – 4.82	4.89***	3.45 – 6.93	F Salient

Table 47 (continued).

	Men (n = 765)		Women (n = 765)		
Substance Abuse Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Began using drugs at an early age?	4.18***	3.08 – 5.67	3.80***	2.76 – 5.23	Neutral
Uses drugs on a regular basis?	4.54***	3.34 – 6.16	4.65***	3.37 – 6.43	Neutral
Has gone on drug-taking sprees?	3.48***	2.56 – 4.73	5.01***	3.62 – 6.94	F Salient
Has combined the use of different drugs?	2.89***	2.12 – 3.95	4.05***	2.92 – 5.61	F Salient
Uses drugs to excess during leisure time?	3.61***	2.66 – 4.88	4.03***	2.92 – 5.57	F Salient
Uses drugs to excess in social situations?	4.31***	3.17 – 5.86	4.20***	3.05 – 5.80	Neutral
Drugs to relieve stress?	3.27***	2.42 – 4.42	4.28***	3.10 – 5.91	F Salient
Drug use interferes with employment?	3.46***	2.43 – 4.92	4.15***	2.97 – 5.80	F Salient
Drug use interferes with marital/family relations?	4.39***	3.19 – 6.04	4.24***	3.07 – 5.84	Neutral
Drug use interferes with social relations?	3.55***	2.55 – 4.95	4.00***	2.89 – 5.53	F Salient
Drug use has resulted in law violations?	3.25***	2.41 – 4.38	4.42***	3.19 – 6.13	F Salient
Drug use interferes with health?	4.21***	2.87 – 6.18	4.24***	3.06 – 5.88	Neutral
Prior substance abuse assessment(s)?	2.67***	1.98 – 3.61	3.22***	2.34 – 4.44	Neutral
Has participated in substance abuse treatment?	2.30***	1.71 – 3.08	3.90***	2.84 – 5.36	F Salient
Has completed substance abuse treatment?	2.47***	1.81 – 3.36	2.60***	1.87 – 3.62	Neutral

Note. [a] Male/female predictors are identified as Neutral (gender neutral), F Salient (female salient), M Salient (male salient), F Specific (female specific), M Specific (male specific), and n.s. (not significant). Odds ratios are identified as small (1.4 – 2.2; reciprocal: .71 – .42), moderate (2.3 – 3.6; reciprocal: .43 - .28), and large (3.7+; reciprocal: .27 – 0).
* $p < .05$ ** $p < .01$ *** $p < .001$.

Logistic regression results for the community functioning domain indicators. Through logistic regression analysis, 12 community functioning indicators were examined and 10 (83%) were found to significantly predict recidivism for males, females, or both genders (see Table 48). Specifically, 7 (58%) of the community functioning indicators were significantly predictive of recidivism for men and 10 (83%) were significantly predictive for women. The magnitude of the odds ratios for the significant community functioning indicators ranged from 1.53 to 2.24 for the male offenders and 1.47 to 2.56 for female offenders. Additionally, for the significant community functioning indicators, 6 (60%) were identified as gender neutral predictors, 1 (10%) was identified as female salient, and 3 (30%) were identified as female specific. None of the community functioning indicators were found to predict recidivism saliently or specifically for men.

Table 48

Predictive Validity of Community Functioning Domain Indicators by Gender

	Men (n = 765)		Women (n = 765)		
Community Functioning Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Has unstable accommodation?	2.34***	1.73 – 3.17	2.31***	1.69 – 3.17	Neutral
Has physical problems?	1.02	0.73 – 1.42	1.65**	1.17 – 2.33	F Specific
Has dental problems?	0.94	0.94 – 1.42	2.28***	1.53 – 3.40	F Specific
Difficulty meeting bills?	1.29	0.96 – 1.72	0.94	0.69 – 1.27	n.s.
Has outstanding debts?	0.94	0.70 – 1.26	0.87	0.64 – 1.19	n.s.
Has no bank accounts?	2.23***	1.67 – 2.99	2.04***	1.50 – 2.77	Neutral
Has no credit?	1.91***	1.41 – 2.59	1.76**	1.26 – 2.47	Neutral
Has no collateral?	2.24***	1.65 – 3.03	1.47*	1.06 – 2.04	Neutral
Has problems writing?	1.15	0.83 – 1.60	1.72*	1.01 – 2.94	F Specific
Has no hobbies?	1.74**	1.25 – 2.40	2.21***	1.49 – 3.27	Neutral
Does not participate in organized activities?	1.53**	1.14 – 2.03	2.14***	1.56 – 2.93	Neutral
Has used social assistance?	1.95***	1.38 – 2.74	2.56***	1.65 – 3.98	F Salient

Note. [a] Male/female predictors are identified as Neutral (gender neutral), F Salient (female salient), M Salient (male salient), F Specific (female specific), M Specific (male specific), and n.s. (not significant). Odds ratios are identified as small (1.4 – 2.2; reciprocal: .71 – .42), moderate (2.3 – 3.6; reciprocal: .43 - .28), and large (3.7+; reciprocal: .27 – 0).
* $p < .05$ ** $p < .01$ *** $p < .001$.

Logistic regression results for the personal/emotional domain indicators.

Thirty-five personal/emotional indicators were examined through logistic regression and 29 (83%) were found to significantly predict recidivism for males, females, or both genders (see Table 49). Specifically, 23 (66%) of the personal/emotional indicators were significantly predictive of recidivism for men and 24 (69%) were significantly predictive for women. With regard to the magnitude of the effect for the significant

personal/emotional indicators, the odds ratios ranged from 1.35 to 2.50 for the male offenders and 1.53 to 2.97 for female offenders. Additionally, for the significant personal/emotional indicators, 10 (34%) were identified as gender neutral predictors, 1 (3%) was identified as male salient, 7 (24%) were identified as female salient, 5 (17%) were identified as male specific, and 6 (21%) were identified as female specific.

Table 49

Predictive Validity of Personal/Emotional Domain Indicators by Gender

	Men (n = 765)		Women (n = 765)		
Personal/Emotional Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Feels especially self-important?	1.04	0.69 – 1.55	1.13	0.65 – 1.97	n.s.
Family ties are problematic?	1.74***	1.30 – 2.33	1.90***	1.40 – 2.58	Neutral
Unable to recognize problem areas?	1.20	0.90 – 1.60	0.75	0.54 – 1.04	n.s.
Has difficulty solving interpersonal problems?	1.57**	1.15 – 2.15	1.77***	1.31 – 2.41	Neutral
Unable to generate choices?	1.37*	1.02 – 1.83	1.07	0.79 – 1.44	M Specific
Unaware of consequences?	1.01	0.76 – 1.34	0.65**	0.47 – 0.88	F Specific
Goal setting is unrealistic?	1.86***	1.34 – 2.59	1.33	0.85 – 2.08	M Specific
Has disregard for others?	1.35*	1.01 – 1.80	2.41***	1.56 – 3.70	F Salient
Socially unaware?	1.37	0.99 – 1.90	1.81*	1.13 – 2.91	F Specific
Impulsive?	2.30***	1.68 – 3.14	2.26***	1.65 – 3.12	Neutral
Incapable of understanding the feelings of others?	1.34	0.99 – 1.83	2.15**	1.26 – 3.67	F Specific
Narrow and rigid thinking?	1.59**	1.18 – 2.14	1.93**	1.26 – 2.93	Neutral
Aggressive?	1.97***	1.47 – 2.66	2.21***	1.55 – 3.14	Neutral
Assertion problem?	0.96	0.72 – 1.29	0.92	0.68 – 1.25	n.s.

Table 49 (continued)

	Men (n = 765)		Women (n = 765)		
Personal/Emotional Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Copes with stress poorly?	2.03***	1.50 – 2.75	2.62***	1.90 – 3.62	F Salient
Poor conflict resolution?	2.10***	1.55 – 2.87	1.58**	1.16 – 2.14	Neutral
Manages time poorly?	2.16***	1.61 – 2.89	2.96***	2.04 – 4.31	F Salient
Low frustration tolerance	1.98***	1.47 – 2.66	2.97**	2.15 – 4.11	F Salient
Hostile?	1.58*	1.10 – 2.25	1.60*	1.03 – 2.49	Neutral
Worries unreasonably?	1.38	0.97 – 1.97	1.31	0.94 – 1.83	n.s.
Takes risk inappropriately?	1.88***	1.40 – 2.52	1.84***	1.32 – 2.57	Neutral
Thrill seeking?	1.79**	1.28 – 2.50	2.44***	1.73 – 3.45	F Salient
Non-reflective?	1.44*	1.08 – 1.92	1.29	0.90 – 1.84	M Specific
Is not conscientious?	2.05***	1.52 – 2.77	2.12**	1.29 – 3.49	Neutral
Manipulative?	1.41*	1.05 – 1.89	2.71***	1.94 – 3.80	F Salient
Inappropriate sexual preferences?	0.34***	0.21 – 0.56	1.16	0.39 – 3.50	M Specific
Sexual attitudes are problematic?	0.60*	0.40 – 0.89	2.30**	1.26 – 4.21	F Salient
Diagnosed as disordered in the past?	2.50**	1.46 – 4.30	1.55*	1.01 – 2.38	M Salient
Prior personal/emotional assessment(s)?	1.53*	1.09 – 2.14	1.31	0.94 – 1.83	M Specific
Past medication?	1.42	0.99 – 2.05	1.61**	1.18 – 2.20	F Specific
Medication currently?	1.62	0.95 – 2.76	1.27	0.90 – 1.79	n.s.
Past hospitalization?	1.36	0.91 – 2.04	1.24	0.87 – 1.77	n.s.
Received outpatient services in the past?	1.79**	1.17 – 2.73	1.53*	1.08 – 2.16	Neutral
Past program participation?	1.42	0.98 – 2.06	1.72**	1.19 – 2.48	F Specific
Current program participation?	1.64	0.90 – 3.01	1.69**	1.14 – 2.52	F Specific

Note. [a] Male/female predictors are identified as Neutral (gender neutral), F Salient (female salient), M Salient (male salient), F Specific (female specific), M Specific (male specific), and n.s. (not significant). Odds ratios are identified as small (1.4 – 2.2; reciprocal: .71 – .42), moderate (2.3 – 3.6; reciprocal: .43 - .28), and large (3.7+; reciprocal: .27 – 0).
* $p < .05$ ** $p < .01$ *** $p < .001$.

Logistic regression results for the attitude domain indicators. For the attitude indicators, 18 were examined through logistic regression and 17 (94%) were found to significantly predict recidivism for males, females, or both genders (see Table 50). In particular, 15 (83%) of the attitude indicators were significantly predictive of recidivism for men and 17 (94%) were significantly predictive for women. The odds ratios for the significant attitude indicators ranged from 1.52 to 2.92 for the male offenders and 1.51 to 4.14 for female offenders. Additionally, for the significant attitude indicators, 6 (35%) were identified as gender neutral predictors, 2 (12%) were identified as male salient predictors, 7 (41%) were identified as female salient predictors, and 2 (12%) were identified as female specific. None of the attitude indicators emerged as male specific predictors of recidivism.

Table 50

Predictive Validity of Attitude Domain Indicators by Gender

	Men (n = 765)		Women (n = 765)		
Attitude Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Negative towards the law?	2.11***	1.57 – 2.82	2.60***	1.76 – 3.84	F Salient
Negative towards police?	2.05***	1.50 – 2.79	1.86**	1.26 – 2.73	Neutral
Negative towards courts?	1.97***	1.45 – 2.69	1.51*	1.02 – 2.25	Neutral
Negative towards corrections?	2.32***	1.59 – 3.38	2.09**	1.30 – 3.36	M Salient
Negative towards community supervision?	2.70***	1.92 – 3.80	2.90***	1.69 – 4.97	Neutral
Negative towards rehabilitation?	1.30	0.87 – 1.95	2.17*	1.11 – 4.25	F Specific
Employment has no value?	2.07***	1.41 – 3.05	2.86***	1.60 – 5.12	F Salient
Values substance abuse?	2.51***	1.86 – 3.37	3.26***	2.15 – 4.92	Neutral

Table 50 (continued).

	Men (n = 765)		Women (n = 765)		
Attitude Indicators	Odds Ratio	95% CI	Odds Ratio	95% CI	Predictor[a]
Basic life skills have no value?	1.96**	1.26 – 3.03	2.75*	1.23 – 6.15	F Salient
Personal/emotional stability has no value?	1.71*	1.06 – 2.74	2.31*	1.12 – 4.75	F Salient
Women/men roles are unequal?	1.45	0.97 – 2.17	1.29	0.85 – 1.98	n.s.
Disrespectful of personal belongings?	2.91***	2.14 – 3.97	3.21***	1.82 – 5.68	Neutral
Disrespectful of public property?	2.92***	2.05 – 4.15	4.14***	2.37 – 7.25	F Salient
Disrespectful of commercial property?	2.67***	1.95 – 3.66	3.27***	2.02 – 5.30	Neutral
Supportive of domestic violence?	1.33	0.89 – 2.00	2.95*	1.17 – 7.44	F Specific
Supportive of instrumental violence?	1.52**	1.11 – 2.07	2.86***	1.71 – 4.78	F Salient
Lacks direction?	2.22***	1.65 – 2.99	3.28***	2.39 – 4.49	F Salient
Non conforming?	2.56***	1.91 – 3.44	1.78**	1.26 – 2.53	M Salient

Note. [a] Male/female predictors are identified as Neutral (gender neutral), F Salient (female salient), M Salient (male salient), F Specific (female specific), M Specific (male specific), and n.s. (not significant). Odds ratios are identified as small (1.4 – 2.2; reciprocal: .71 – .42), moderate (2.3 – 3.6; reciprocal: .43 - .28), and large (3.7+; reciprocal: .27 – 0).
* $p < .05$ ** $p < .01$ *** $p < .001$.

Hypothesis 3 results: Moderated logistic regression results for combined sample. Each of the 158 indicators included in the present study were also examined through logistic regression to determine the predictive validity of each indicator for the combined sample of male and female offenders. Thus, 158 separate logistic regression analyses were conducted for each of the indicators for men and women combined. In

total, 126 (80%) indicators were found to significantly predict recidivism for the combined male and female sample (see Tables 3 to 9).

Gender was then examined as a moderating variable for each of the 126 indicators significantly predictive of recidivism for the male and female sample combined. This was conducted through hierarchical logistic regression. Specifically, seven hierarchical logistic regression analyses were conducted; one for each set of significantly predictive indicators corresponding to each of the seven DFIA domains. For each DFIA domain, the corresponding indicators found to significantly predict recidivism for the entire offender sample were entered into block one of the logistic regression model along with gender as a predictor, followed by the interaction term of the indicator and gender in the second block. For example, all of the employment indicators found to significantly predict recidivism for the combined male and female offender sample along with gender as a predictor variable were entered into the first block of the logistic regression model. Next, each interaction term of the significant employment indicators and gender were entered into the second block of the regression model.

Moderated logistic regression results for the employment domain indicators. Of the 29 employment indicators examined in the present study, 19 (66%) were found to significantly predict recidivism for the combined male and female sample and were included in the hierarchical logistic regression (see Table 3). Of these indicators, only one was found to significantly interact with gender. The employment indicator 'has an unstable job history' was found to significantly interact with gender, indicating that the influence of an unstable job history on recidivism varies as a result of gender (see Table 51). Upon examination of the odds ratios for the indicator 'has an unstable job history'

separately for males and females, a large effect was identified for both, however, a slightly larger odds ratio was detected for female offenders (Odds Ratio = 3.37, p < .001, 95% CI = 2.29 to 4.95) compared to male offenders (Odds Ratio = 2.45, p < .001, 95% CI = 1.77 to 3.38) (see Figure 3). Although appearing quite small, Figure 2 demonstrates the differences in the rate of recidivism based on an unstable job history for each gender.

Table 51

Moderated Hierarchical Logistic Regression: Employment Domain Indicators by Gender.

Employment Domain Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Has less than grade 10	0.35	0.17	4.21*	1.41	1.02 – 1.97
Has concentration problems	0.45	0.18	6.21*	1.57	1.10 – 2.24
Unemployed at time of arrest	0.65	0.15	19.04***	1.92	1.43 – 2.57
Has an unstable job history	0.54	0.16	11.75**	1.71	1.26 – 2.32
Gender	0.64	0.14	19.63***	1.90	1.43 – 2.51
Block 2					
Unemployed at time of arrest	0.67	0.26	6.91**	1.95	1.19 – 3.22
Has an unstable job history	0.91	0.24	14.22***	2.48	1.55 – 3.97
Gender	0.91	0.36	6.43*	2.48	1.23 – 5.02
Has an unstable job history x Gender	-0.68	0.32	4.49*	0.51	0.27 – 0.95
Nagelkerke R^2	0.17				
Model χ^2 (df = 37)	173.72***				

Note. N = 1530. All employment indicators significantly predictive of recidivism (n = 19) for the combined male and female total sample (see Table 3) were entered into the hierarchical logistic regression model, but only the indicators emerging as significant predictors in the hierarchical logistic regression are shown. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

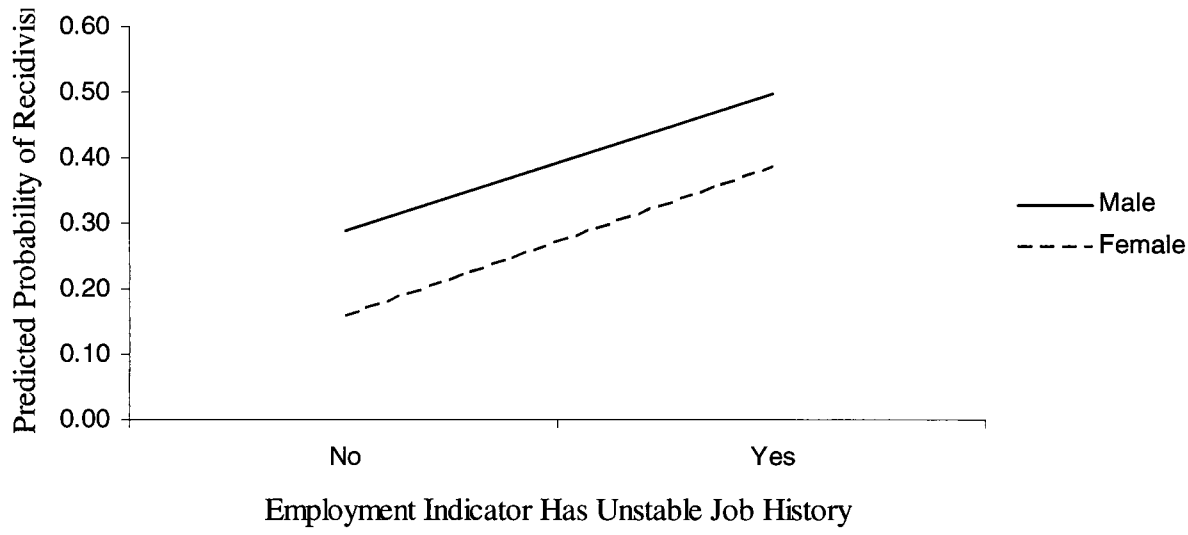

Figure 2

Moderating Effect of Gender on the Employment Indicator Has Unstable Job History.

Moderated logistic regression results for the associates domain indicators. Of the 11 associates indicators examined in the present study, 6 (55%) were found to significantly predict recidivism for the combined male and female sample and were included in the hierarchical logistic regression analysis (see Table 4). Although some of these indicators were found to significantly predict recidivism in the first and second block of the regression model, there were no significant interactions between any of the associates indicators and gender (see Table 52).

Table 52

Moderated Hierarchical Logistic Regression: Associates Domain Indicators by Gender.

Associates Domain Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Associates with substance abusers	0.77	0.14	30.79***	2.17	1.65 – 2.85
Has many criminal acquaintances	0.41	0.14	8.28**	1.50	1.14 – 1.98
Has mostly criminal friends	0.58	0.14	16.80***	1.79	1.36 – 2.36
Gender	0.40	0.12	11.85**	1.49	1.19 – 1.86
Block 2					
Associates with substance abusers	0.88	0.21	17.85***	2.42	1.61 – 3.64
Has mostly criminal friends	0.63	0.21	9.07**	1.88	1.25 – 2.85
Gender	0.67	0.25	7.36**	1.95	1.20 – 3.16
Nagelkerke R^2	0.17				
Model χ^2 (df = 13)	197.84***				

Note. N = 1530. All associates indicators significantly predictive of recidivism (n = 6) for the combined male and female total sample (see Table 3) were entered into the hierarchical logistic regression model, but only the indicators emerging as significant predictors in the hierarchical logistic regression are shown. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Moderated logistic regression results for the marital/family domain indicators.

Twenty-four marital/family indicators were examined in the present study and 17 (71%) were found to significantly predict recidivism for the combined male and female sample (see Table 5). These 17 indicators were included in the hierarchical logistic regression analysis. Through the hierarchical logistic regression with the marital/family indicators, four significant interactions were identified (see Table 53).

Table 53

Moderated Hierarchical Logistic Regression: Marital/Family Domain Indicators by Gender.

Marital/Family Domain Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Family members involved in crime	0.53	0.12	10.67***	1.70	1.35 – 2.14
Has no parenting responsibilities	0.47	0.13	12.03**	1.59	1.22 – 2.07
Unable to handle parenting responsibilities	0.58	0.19	9.76**	1.78	1.24 – 2.57
Gender	0.57	0.12	23.83***	1.78	1.41 – 2.24
Block 2					
Maternal relations negative as a child	0.42	0.21	3.95*	1.53	1.01 – 2.32
Family members involved in crime	0.58	0.17	10.99**	1.78	1.27 – 2.50
Has no parenting responsibilities	0.70	0.19	13.11***	2.01	1.38 – 2.93
Unable to handle parenting responsibilities	0.95	0.25	14.16***	2.59	1.58 – 4.24
Father absent during childhood x Gender	0.65	0.27	5.75*	1.92	1.13 – 3.27
Currently single x Gender	0.90	0.24	13.68***	2.45	1.52 – 3.93
Has no parenting responsibilities x Gender	-0.58	0.28	4.25*	0.56	0.32 – 0.97
Unable to handle parenting responsibilities x Gender	-0.80	0.38	4.35*	0.45	0.21 – 0.95
Nagelkerke R^2	0.14				
Model χ^2 (df = 35)	161.44***				

Note. N = 1530. All marital/family indicators significantly predictive of recidivism (n = 17) for the combined male and female total sample (see Table 3) were entered into the hierarchical logistic regression model, but only the indicators emerging as significant predictors in the hierarchical logistic regression are shown. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Gender was found to moderate the relationship between recidivism and the indicators 'father absent during childhood', 'currently single', 'has no parenting responsibilities', and 'unable to handle parenting responsibilities'. When comparing the odds ratios of these indicators between male and female offenders, 'father absent during childhood' was a significant predictor for male offenders (Odds Ratio = 1.81, $p < .001$, 95% CI = 1.34 to 2.44), but not significant for female offenders (Odds Ratio = 1.08, $p = .632$, 95% CI = 0.79 to 1.46). This interaction is depicted in Figure 4 as it demonstrates that the probability of recidivism increases for male offenders who lacked a father figure during childhood. Additionally, Figure 3 demonstrates that the probability of recidivism for female offenders does not change if a father was absent or present during childhood.

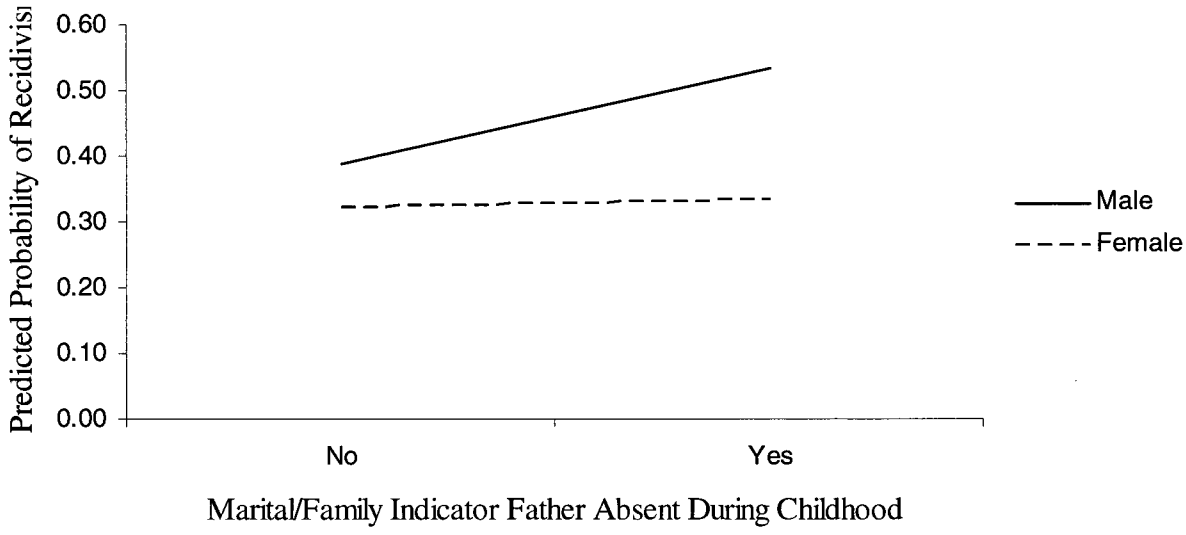

Figure 3

Moderating Effect of Gender on the Marital/Family Indicator Father Absent During Childhood.

The same interaction trend was found for the indicator 'currently single', which was a significant predictor of recidivism for male offenders (Odds Ratio = 1.95, $p < .001$, 95% CI = 1.45 to 2.63), but not significant for female offenders (Odds Ratio = 0.84, $p = .275$, 95% CI = 0.62 to 1.15). As shown in Figure 4, the probability of recidivism increases for men who are single compared to men who are not single. Opposite this, Figure 5 illustrates the probability of recidivism decreases for female offenders who are single compared and those who are not.

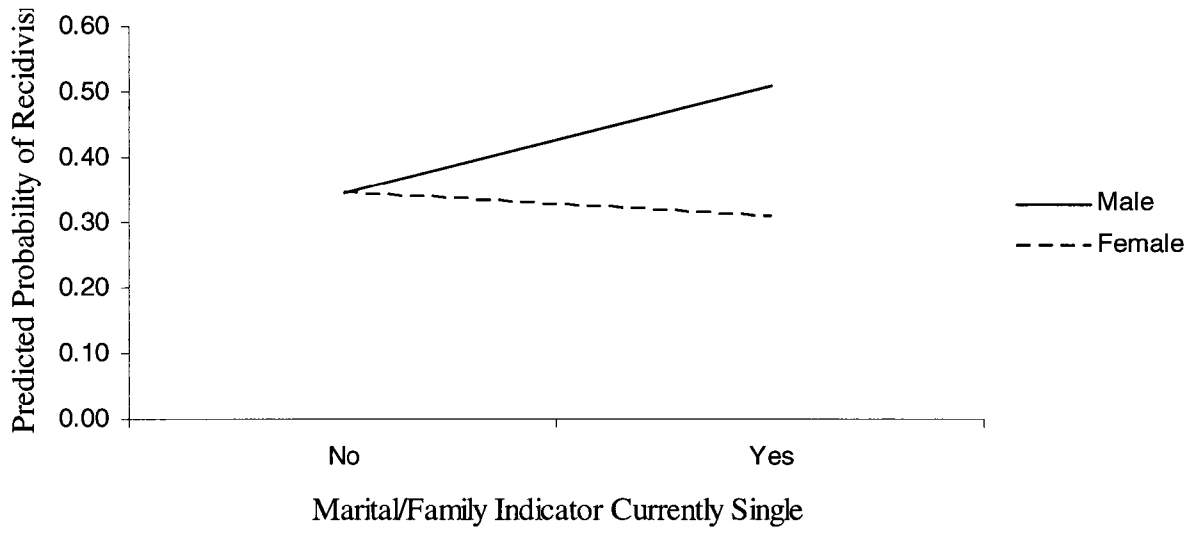

Figure 4

Moderating Effect of Gender on the Marital/Family Indicator Currently Single.

The marital/family indicator, 'has no parenting responsibilities', identified to significantly interact with gender, was found to predict recidivism for the entire male and female offender sample, but was not found to be a significant predictor of recidivism for either male (Odds Ratio = 1.20, $p = .218$, 95% CI = 0.90 to 1.60) or female (Odds Ratio = 1.28, p = 125, 95% CI = 0.94 to 1.74) offenders separately. However, a slightly larger

odds ratio was identified for female offenders. As can be seen in Figure 5, a trend for a slightly larger increase in the predicted probability of recidivism was observed for female offenders who had no parenting responsibilities compared to male offenders with no parenting responsibilities.

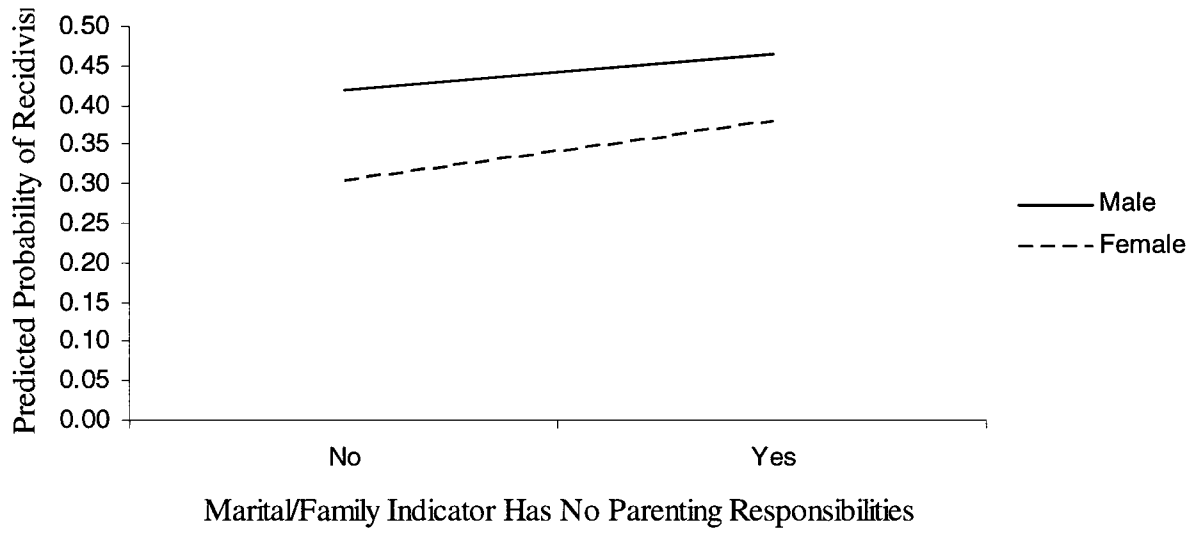

Figure 5

Moderating Effect of Gender on the Marital/Family Indicator Has no Parenting Responsibilities.

And finally, for the interaction between the marital/family indicator 'unable to handle parenting responsibilities' and gender, this indicator was found to significantly predict recidivism for female offenders (Odds Ratio = 2.46, $p < .001$, 95% CI = 1.69 to 3.58), but was not significantly predictive for male offenders (Odds Ratio = 1.19, $p = .423$, 95% CI = 0.78 to 1.80). This interaction is clearly illustrated in Figure 7. The probability of recidivism is observed in Figure 6 to increase for female offenders who are unable to handle their parenting responsibilities compared to those that can handle their parenting responsibilities. However, for male offenders, the probability of recidivism

appears to remain similar for men who can and cannot handle their parenting responsibilities.

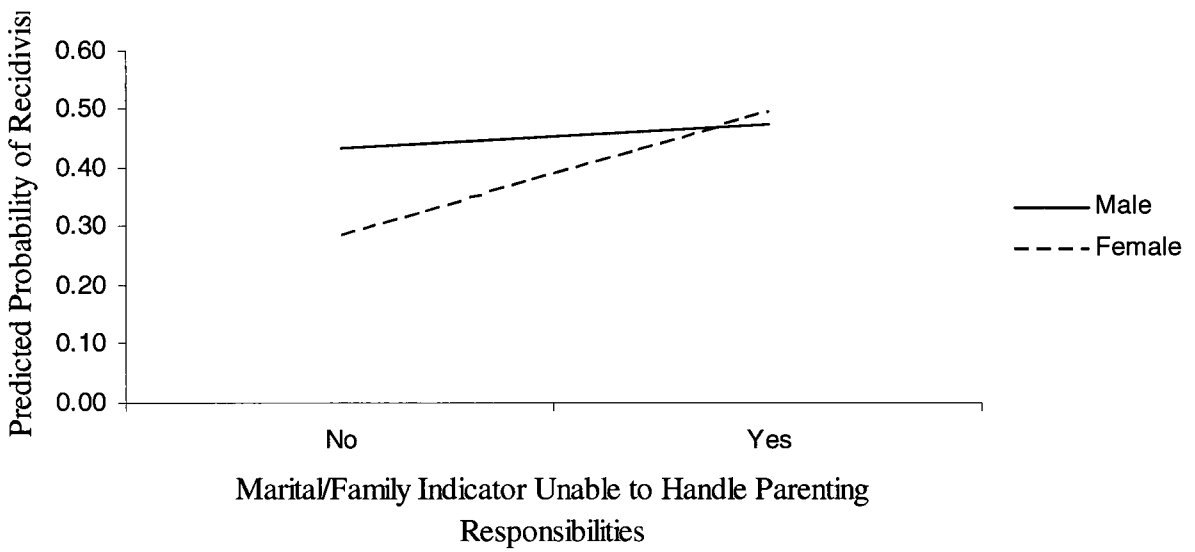

Figure 6

Moderating Effect of Gender on the Marital/Family Indicator Unable to Handle Parenting Responsibilities.

Moderated logistic regression results for the substance abuse domain indicators. A total of 29 substance abuse indicators were examined through univariate logistic regression analysis and all were found to significantly predict recidivism for the combined male and female sample (see Table 6). Therefore, all of the substance abuse indicators were included in the hierarchical logistic regression analysis. In total, four significant interactions were found with gender moderating the relationship between recidivism and 'abuses alcohol', 'has participated in substance abuse treatment', 'has completed substance abuse treatment' and 'drug use interferes with marital/family' (see Table 54).

Table 54

Moderated Hierarchical Logistic Regression: Substance Abuse Domain Indicators by Gender.

Substance Abuse Domain Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Drinks on a regular basis	0.53	0.22	5.69*	1.70	1.10 – 2.61
Drinking interferes with health	-0.41	0.21	3.89*	0.66	0.44 – 1.00
Uses drugs on a regular basis	0.69	0.22	10.32**	2.00	1.31 – 3.06
Uses drugs to excess in social situations	0.59	0.25	5.47*	1.80	1.10 – 2.95
Drug use interferes with marital/family	0.50	0.21	6.00*	1.65	1.11 – 2.47
Drug use interferes with health	0.47	0.19	5.97*	1.61	1.10 – 2.35
Block 2					
Drinks on a regular basis	0.71	0.34	4.22*	2.03	1.03 – 3.97
Drinking interferes with health	-0.73	0.33	5.03*	0.48	0.25 – 0.91
Has participated in substance abuse treatment	0.79	0.31	6.34*	2.19	1.19 – 4.04
Gender	0.57	0.23	6.01*	1.77	1.12 – 2.79
Abuses alcohol x Gender	-1.32	0.62	4.50*	0.27	0.08 – 0.90
Drug use interferes with marital/family x Gender	0.94	0.43	4.75*	2.55	1.10 – 5.91
Has participated in substance abuse treatment x Gender	-1.25	0.45	7.61**	0.29	0.12 – 0.70
Has completed substance abuse treatment x Gender	1.07	0.41	6.99**	2.92	1.32 – 6.45
Nagelkerke R^2	0.29				
Model χ^2 (df = 59)	359.65***				

Note. N = 1530. All substance abuse indicators significantly predictive of recidivism (n = 29) for the combined male and female total sample (see Table 3) were entered into the hierarchical logistic regression model, but only the indicators emerging as significant predictors in the hierarchical logistic regression are shown. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

When examining the odds ratios for 'abuses alcohol' separately for each gender, a larger effect was found for female offenders (Odds Ratio = 2.54, $p < .001$, 95% CI =1.86 to 3.48) compared to male offenders (Odds Ratio = 2.13, $p < .001$, 95% CI = 1.58 to 2.86). Although this interaction is difficult to identify in Figure 7, the probability of recidivism does appear to increase slightly more for female offenders who abuse alcohol than to male offenders who abuse alcohol compared to offenders who do not abuse alcohol at all.

Figure 7

Moderating Effect of Gender on the Substance Abuse Indicator Abuses Alcohol.

Similar findings were also obtained for the interaction between gender and the substance abuse indicator 'has participated in substance abuse treatment'. A larger effect was found for females (Odds Ratio = 3.90, $p < .001$, 95% CI = 2.84 to 5.36) compared to males (Odds Ratio = 2.30, $p < .001$, 95% CI = 1.71 to 3.08). This interaction is

illustrated in Figure 8 and demonstrates that the probability of recidivism for female offenders increases more for women who have participated in substance abuse treatment compared to women who have not more so than for men who have participated compared to those who have not.

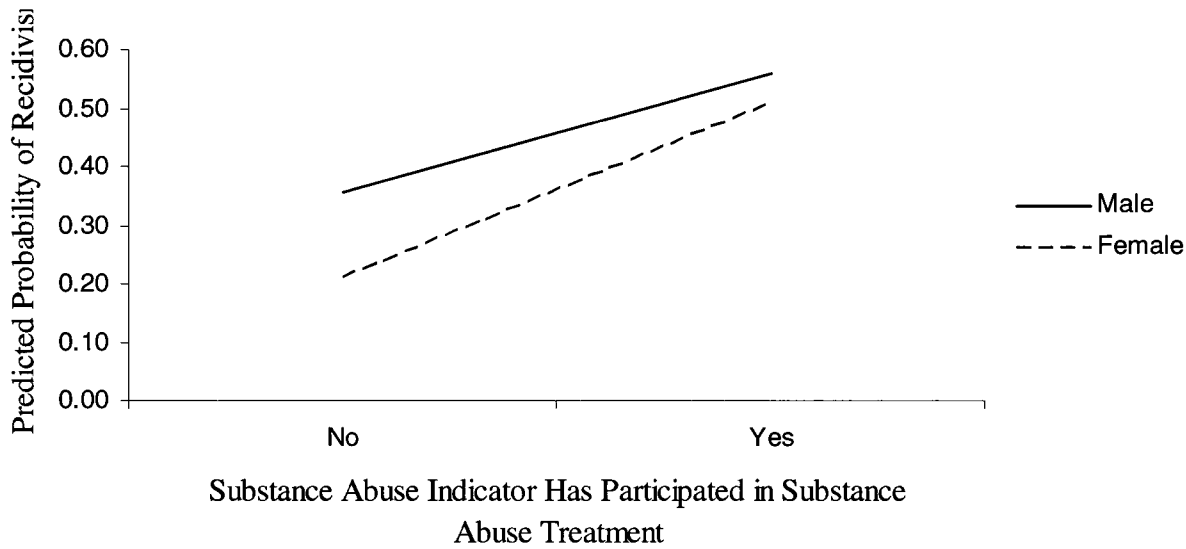

Figure 8

Moderating Effect of Gender on the Substance Abuse Indicator Has Participated in Substance Abuse Treatment.

For the interaction between gender and the substance abuse indicator 'has completed substance abuse treatment', a larger odds ratio was again identified for females (Odds Ratio = 2.60, $p < .001$, 95% CI = 1.87 to 3.62), however, the magnitude of the effect was not different from the male offenders (Odds Ratio = 2.47, $p < .001$, 95% CI = 1.81 to 3.36). Interestingly, although a significant interaction term was identified, the illustration of this interaction in Figure 9 does not appear to represent this relationship.

This is likely due to the slight difference in the obtained odds ratios for male and female offenders.

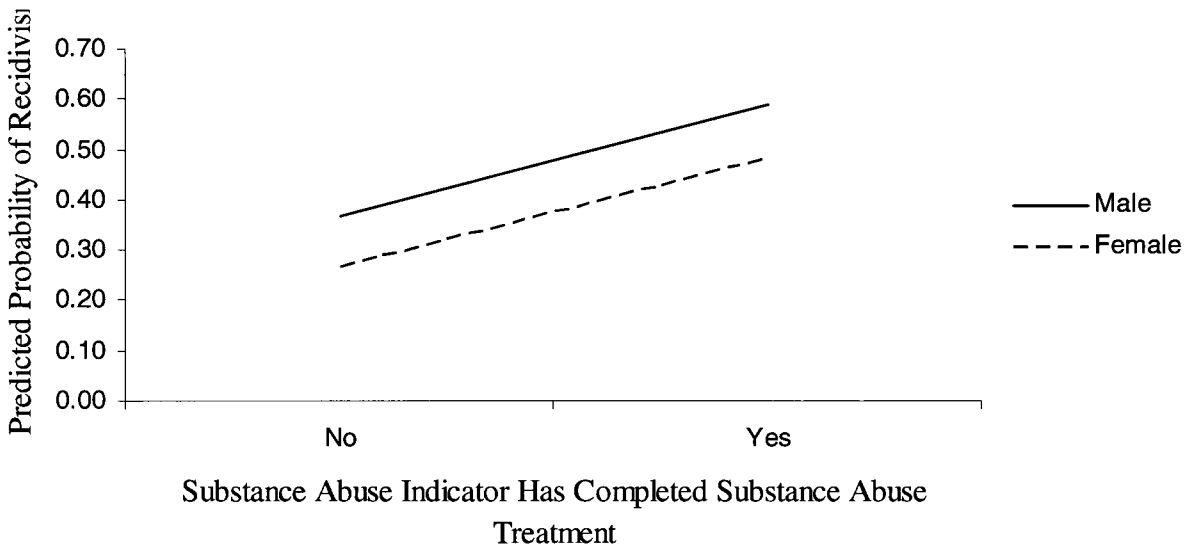

Figure 9

Moderating Effect of Gender on the Substance Abuse Indicator Has Completed Substance Abuse Treatment.

Finally, for the interaction term including the substance abuse indicator 'drug use interferes with marital/family', the odds ratios were similar for females (Odds Ratio = 4.24, $p < .001$, 95% CI = 3.07 to 5.84) and males (Odds Ratio = 4.39, $p < .001$, 95% CI = 3.19 to 6.04). However, Figure 10 does reflect the obtained odds ratios. The probability of recidivism appears to increase more for men whose drug use interferes with their family than those whose does not compared to females.

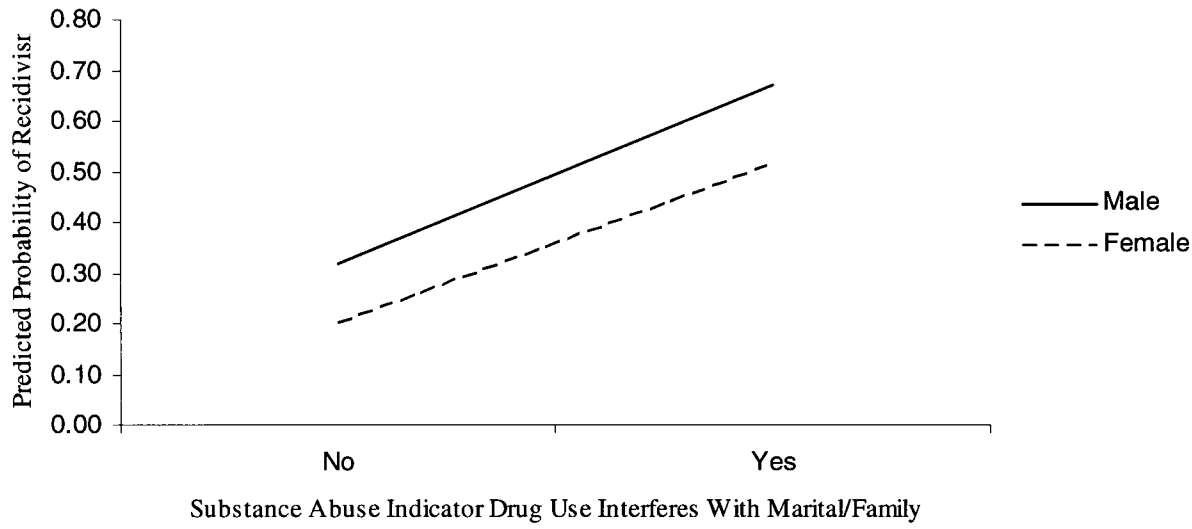

Figure 10

Moderating Effect of Gender on the Substance Abuse Indicator Drug Use Interferes with Marital/Family.

Moderated logistic regression results for the community functioning domain indicators. Twelve community functioning indicators were examined in the present study and 10 (83%) were found to significantly predict recidivism for the combined male and female sample and were included in the hierarchical logistic regression analysis (see Table 7). One significant interaction was identified in the second block of the regression model. Gender was found to moderate the relationship between 'has dental problems' and recidivism (see Table 55).

Table 55

Moderated Hierarchical Logistic Regression: Community Functioning Domain Indicators by Gender.

Community Functioning Domain Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Has unstable accommodation	0.56	0.12	22.00***	1.75	1.38 – 2.20
Has no bank accounts	0.43	0.13	11.10**	1.54	1.20 – 1.99
Has used social assistance	0.52	0.14	12.75***	1.67	1.26 – 2.22
Gender	0.49	0.12	17.31***	1.62	1.29 – 2.04
Block 2					
Has unstable accommodation	0.48	0.18	7.56**	1.62	1.15 – 2.28
Has dental problems	0.58	0.22	7.18**	1.79	1.17 – 2.75
Does not participate in organized activities	0.49	0.18	7.16**	1.63	1.14 – 2.34
Has used social assistance	0.74	0.24	9.67**	2.10	1.32 – 3.35
Gender	0.95	0.32	8.76**	2.58	1.38 – 4.85
Has dental problems x Gender	-0.71	0.31	5.24*	0.49	0.27 – 0.90
Nagelkerke R^2	0.14				
Model χ^2 (df = 21)	164.34***				

Note. N = 1530. All community functioning indicators significantly predictive of recidivism (n = 10) for the combined male and female total sample (see Table 3) were entered into the hierarchical logistic regression model, but only the indicators emerging as significant predictors in the hierarchical logistic regression are shown. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Exploration of the indicator 'has dental problems' based on gender revealed this indicator to be a significant predictor for females (Odds Ratio = 2.28, p < .001, 95% CI = 1.53 to 3.40), but not a significant predictor for males (Odds Ratio = 0.94, p = .764, 95%

CI = 0.62 to 1.42). This interaction is demonstrated in Figure 11. It can be seen that while the probability of recidivism increases for female offenders who have dental problems compared to those who do not, the probability of recidivism changes very little for men who have dental problems and those who do not have dental problems.

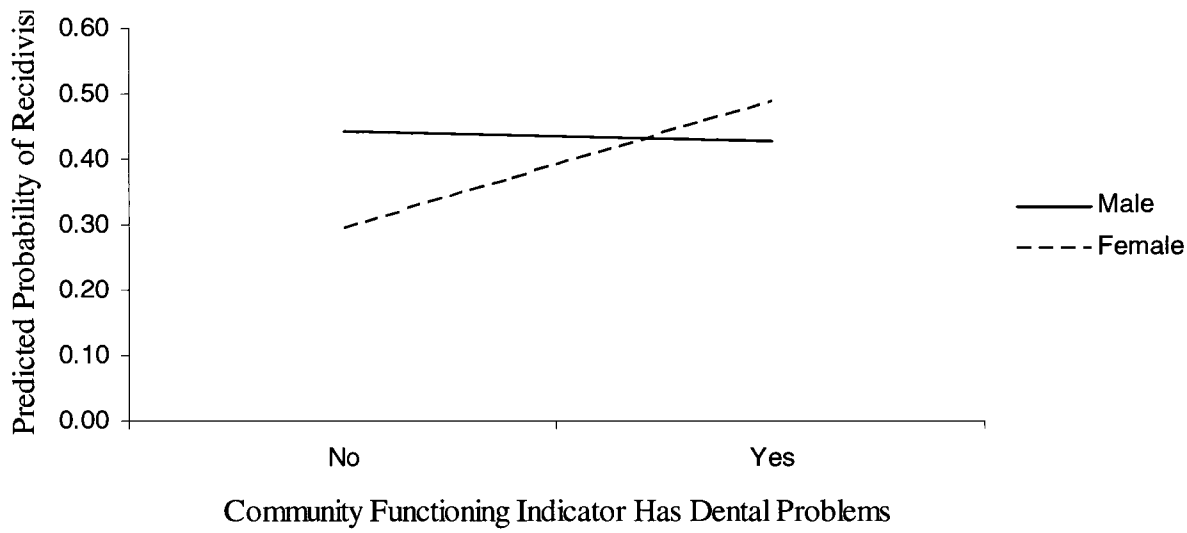

Figure 11

Moderating Effect of Gender on the Community Functioning Indicator Has Dental Problems.

Moderated logistic regression results for the personal/emotional domain indicators. Of the 35 personal/emotional indicators examined in the present study, 27 (77%) were found to significantly predict recidivism for the combined male and female sample (see Table 8). Thus, these 27 indicators were included in the hierarchical logistic regression analysis. Only one personal/emotional indicator, 'goal setting is unrealistic', demonstrated a significant interaction with gender (see Table 56).

Table 56

Moderated Hierarchical Logistic Regression: Personal/Emotional Domain Indicators by Gender.

Personal/Emotional Domain Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Family ties are problematic	0.30	0.12	6.11*	1.35	1.06 – 1.71
Unable to generate choices	-0.26	0.13	3.89*	0.77	0.59 – 1.00
Impulsive	0.32	0.14	5.17*	1.37	1.05 – 1.80
Copes with stress poorly	0.35	0.14	6.42*	1.42	1.08 – 1.87
Manages time poorly	0.47	0.14	11.02**	1.59	1.21 – 2.10
Has low frustration tolerance	0.46	0.15	9.99**	1.59	1.19 – 2.11
Hostile	-0.41	0.18	4.88*	0.67	0.47 – 0.96
Takes risks inappropriately	0.32	0.13	6.05*	1.37	1.07 – 1.77
Gender	0.46	0.14	10.94**	1.58	1.20 – 2.07
Block 2					
Family ties are problematic	0.42	0.18	5.34*	1.52	1.07 – 2.16
Goal setting is unrealistic	-0.66	0.29	4.99*	0.52	0.29 – 0.92
Copes with stress poorly	0.47	0.20	5.47*	1.60	1.08 – 2.38
Manages time poorly	0.64	0.23	7.90**	1.90	1.22 – 2.98
Has low frustration tolerance	0.73	0.23	9.91**	2.08	1.32 – 3.28
Thrill seeking	0.41	0.21	3.89*	1.51	1.00 – 2.27
Manipulative	0.43	0.22	3.94*	1.54	1.01 – 2.35
Gender	0.73	0.28	7.00**	2.08	1.21 – 3.57
Goal setting is unrealistic x Gender	0.87	0.35	6.10*	2.39	1.20 – 4.79
Nagelkerke R^2	0.18				
Model χ^2 ($df = 53$)	221.35***				

Note. $N = 1530$. All personal/emotional indicators significantly predictive of recidivism ($n = 27$) for the combined male and female total sample (see Table 3) were entered into the hierarchical logistic regression model, but only the indicators emerging as significant predictors in the hierarchical logistic regression are shown. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Examining the indicator "goal setting is unrealistic' based on gender revealed this indicator to be a significant predictor for male offenders (Odds Ratio = 1.86, $p < .001$, 95% CI = 1.34 to 2.59), but not for female offenders (Odds Ratio = 1.33, $p = .220$, 95% CI = 1.34 to 2.59). As shown in Figure 12, the probability of recidivism increases for males who set unrealistic goals compared to males who have realistic goals. However, for female offenders, the probability of recidivism does not appear to differ substantially for women who set realistic or unrealistic goals.

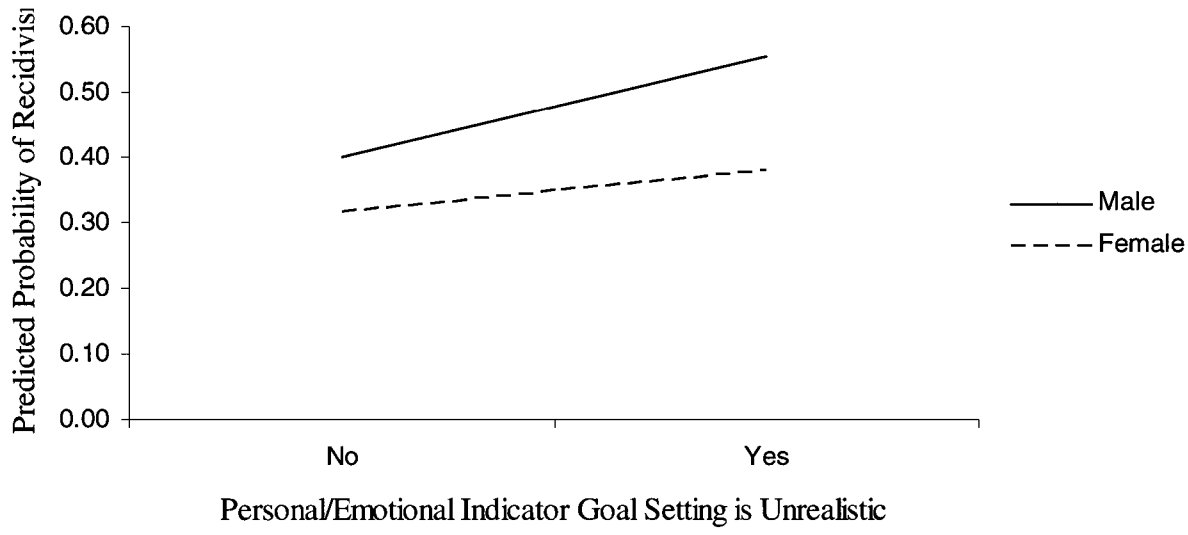

Figure 12

Moderating Effect of Gender on the Personal/Emotional Indicator Goal Setting is Unrealistic.

Moderated logistic regression results for the attitude domain indicators. Finally, the 18 attitude indicators were examined and all of the indicators were found to significantly predict recidivism for the combined male and female sample through the

univariate logistic regression analyses (see Table 9). Thus, all of the attitude indicators were entered into the hierarchical logistic regression analysis. Two significant interactions were identified through the hierarchical logistic regression (see Table 57). Gender was found to moderate the relationship between recidivism and the indicators 'lacks direction' and 'non-conforming'.

Table 57

Moderated Hierarchical Logistic Regression: Attitude Domain Indicators by Gender.

Attitude Domain Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Negative towards rehabilitation	-0.71	0.24	8.83**	0.49	0.31 – 0.79
Values substance abuse	0.60	0.15	16.91***	1.82	1.37 – 2.42
Disrespectful of public property	0.46	0.21	4.88*	1.59	1.05 – 2.40
Lacks direction	0.66	0.13	28.01***	1.94	1.52 – 2.48
Block 2					
Values substance abuse	0.60	0.26	5.18*	1.82	1.09 – 3.03
Disrespectful of public property	0.84	0.40	4.37*	2.33	1.05 – 5.13
Lacks direction	0.99	0.18	30.60***	2.70	1.90 – 3.83
Lacks direction x Gender	-0.69	0.26	7.25**	0.50	0.30 – 0.83
Non-conforming x Gender	0.64	0.30	4.57*	1.89	1.06 – 3.39
Nagelkerke R^2	0.18				
Model χ^2 (df = 37)	220.12***				

Note. N = 1530. All attitude indicators significantly predictive of recidivism (n = 18) for the combined male and female total sample (see Table 3) were entered into the hierarchical logistic regression model, but only the indicators emerging as significant predictors in the hierarchical logistic regression are shown. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

First, the influence of the indicator 'lacks direction' based on gender was examined and a stronger effect was found for female offenders (Odds Ratio = 3.28, $p < .001$, 95% CI = 2.39 to 4.49) compared to male offenders (Odds Ratio = 2.22, $p < .001$, 95% CI = 1.65 to 2.99). As depicted in Figure 13, the probability of recidivism increases for females who lack direction compared to females who do not lack direction. However, although the probability of recidivism for male offenders demonstrates a similar trend, the increase in recidivism is not as substantial for men.

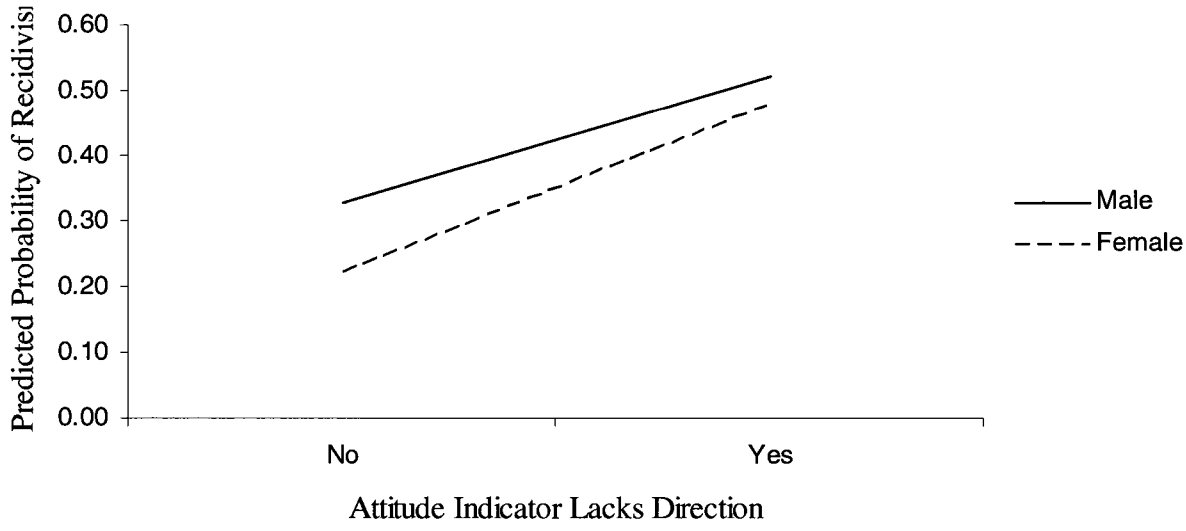

Figure 13

Moderating Effect of Gender on the Attitude Indicator Lacks Direction.

For the interaction between the attitude indicator 'non-conforming' and gender, a stronger effect was identified for male offenders (Odds Ratio = 2.56, $p < .001$, 95% CI = 1.91 to 3.44) compared to female offenders (Odds Ratio = 1.78, $p = .001$, 95% CI = 1.26 to 2.53). Figure 14 demonstrates that the probability of recidivism increases for males

who are non-conforming compared to males who do conform. For female offenders, the increase in the probability of recidivism is not quite as pronounced for females who are non-conforming compared to females who do conform.

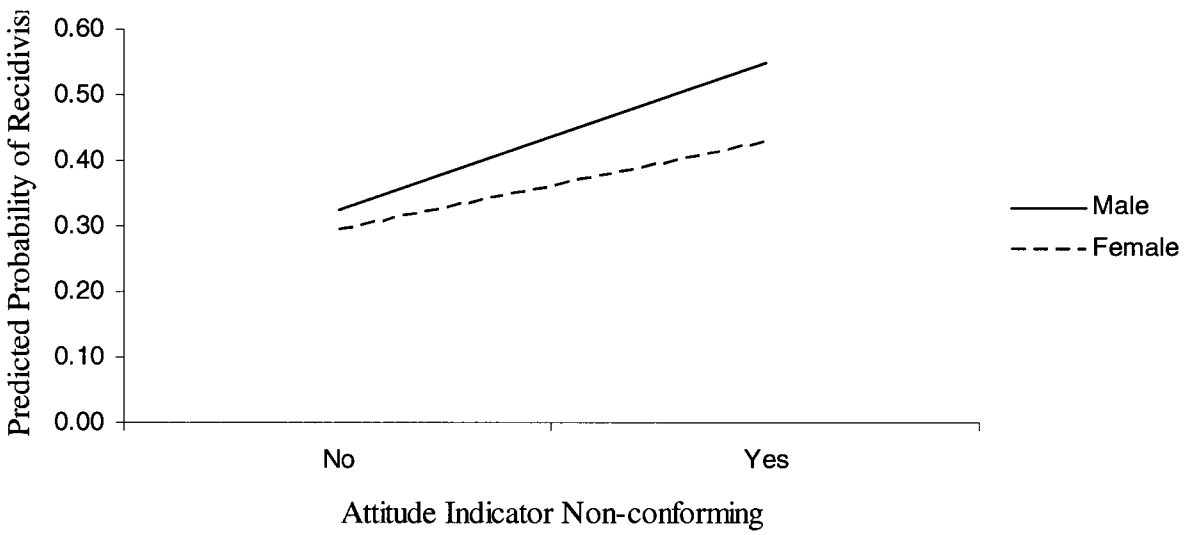

Figure 14

Moderating Effect of Gender on the Attitude Indicator Non-conforming

Exploratory Analysis Results: Incremental Predictive Validity

The incremental predictive validity of the gender neutral and the gender salient/specific indicators was examined through hierarchical logistic regression. To begin these analyses, the indicators significantly identified as gender neutral, salient, and specific in the analyses for the disaggregate sample in hypothesis three were first examined (see Tables 44 to 50). These gender neutral, salient, and specific indicators were examined through logistic regression to identify those which significantly predicted recidivism most strongly for female offenders. For example, for the female offender sample, all of the gender neutral indicators from each of the DFIA domains were entered simultaneously into a logistic regression analysis to identify those which most strongly

predict recidivism for women over and above the remaining gender neutral indicators. The same analyses were repeated with the female salient/specific indicators. Specifically, all of the female salient or specific indicators from all of the DFIA domains were entered simultaneously into a logistic regression to identify those which most strongly predict recidivism for women.

The indicators identified as most strongly predictive of recidivism were then used to assess the incremental predictive validity of the female salient/specific indicators. First, for the female offender sample, the strongest predicting gender neutral indicators were entered into the first block of a hierarchical logistic regression model, followed by the strongest predicting female salient/specific indicators in the second block. This allowed for the identification of the female salient/specific indicators that predicted recidivism over and above the gender neutral indicators.

Following this, the incremental predictive validity of the gender neutral indicators was examined for the female offenders. First, the strongest predicting female salient/specific indicators were entered into the first block of a hierarchical logistic regression model. Following this, the strongest predicting gender neutral indicators were entered into the second block of the regression model. The female salient/specific indicators that emerged as significantly predictive in the second block were identified as those continuing to predict recidivism after considering the influence of the gender neutral indicators.

Exploratory results: Incremental predictive validity of the female salient/specific indicators. The incremental predictive validity of the female salient/specific indicators was examined for the female offender sample. The strongest

gender neutral indicators for women (n = 5) were entered into the first block of a hierarchical logistic regression model, followed by the strongest female salient/specific indicators (n = 5) entered into the second block. Of the gender neutral indicators entered into block one, four were found to significantly predict recidivism in the first block of the model (has less than grade 10, prior substance abuse assessment(s), aggressive, and negative towards community supervision) (see Table 58). In the second block, two of the gender neutral indicators (has less than grade 10 and prior substance abuse assessment) remained significant predictors of recidivism. Additionally, three female salient/specific indicators (has dental problems, manipulative, and lacks direction) demonstrated significant predictive ability above and beyond the significant gender neutral indicators (see Table 58). The model with both the gender neutral and the female salient/specific indicators demonstrated an overall predictive accuracy rate of 72.4%, an improvement over the accuracy rate of 68.5% for block one. Additionally, the full model was significantly predictive of recidivism ($\chi^2(10, N = 628) = 124.25, p < .001$) and demonstrated a better fit (Nagelkerke $R^2 = 0.21$) than the first block alone (Nagelkerke $R^2 = 0.15$). Furthermore, the predictive power of the female salient indicators when entered into block two was significant after adjusting for the gender neutral indicators ($\chi^2(5, N = 628) = 34.68, p < .001$).

Table 58

Hierarchical Logistic Regression: Incremental Predictive Validity of the Female Salient/Specific Indicators Over and Above the Gender Neutral Indicators.

Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Gender Neutral Indicators					
Has less than grade 10	0.70	0.17	17.80***	2.01	1.45 – 2.77
Prior substance abuse assessment(s)	0.86	0.22	15.79***	2.35	1.54 – 3.59
Has completed substance abuse treatment	0.27	0.22	1.41	1.30	0.84 – 2.02
Aggressive	0.55	0.20	7.76**	1.73	1.18 – 2.53
Negative towards community supervision	0.70	0.30	5.55*	2.02	1.13 – 3.63
Nagelkerke R^2	0.15				
Model χ^2 (df = 5)	89.57***				
Block 2					
Gender Neutral Indicators					
Has less than grade 10	0.58	0.17	10.98**	1.78	1.27 – 2.50
Prior substance abuse assessment(s)	0.61	0.23	7.33**	1.84	1.18 – 2.87
Has completed substance abuse treatment	0.27	0.23	1.39	1.31	0.83 – 2.07
Aggressive	0.17	0.22	0.62	1.19	0.78 – 1.81
Negative towards community supervision	0.43	0.31	1.88	1.53	0.83 – 2.81
Female Salient/Specific Indicators					
Has learning disabilities	-0.11	0.31	0.13	0.89	0.48 – 1.65
Has dental problems	0.54	0.23	5.58*	1.71	1.10 – 2.68
Manipulative	0.56	0.20	7.70**	1.74	1.18 – 2.58
Prescribed medication in the past	0.11	0.18	0.36	1.11	0.78 – 1.58
Lacks direction	0.74	0.18	16.83***	2.10	1.47 – 2.99
Nagelkerke R^2	0.21				
Block χ^2 (df = 5)	34.68***				
Model χ^2 (df = 10)	124.25***				

Note. $N = 765$. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Exploratory results: Incremental predictive validity of the gender neutral indicators. The incremental predictive validity of the gender neutral indicators was then examined for the female offender sample. The strongest female salient/specific indicators (n = 5) were entered into the first block of a hierarchical logistic regression model, followed by the strongest gender neutral indicators (n = 5) entered into the second block. Three female salient/specific indicators were found to significantly predict recidivism in block one (has dental problems, manipulative, and lacks direction) (see Table 59). These three indicators remained significant when entered into block two of the regression model. Two gender neutral indicators (has less than grade 10 and prior substance abuse assessment) emerged as significantly predictive of recidivism in block two above and beyond the female salient/specific indicators. The overall model consisting of the female salient/specific and gender neutral indicators revealed the model to be significantly predictive of recidivism ($\chi^2(10, N = 628) = 124.25, p < .001$) and demonstrated a better fit (Nagelkerke $R^2 = 0.21$) than the first block with just the male salient/specific indicators (Nagelkerke $R^2 = 0.15$). Additionally, the predictive power of the gender neutral indicators was significant when entered into block two after adjusting for the female salient/specific indicators ($\chi^2(5, N = 628) = 37.19, p <.001$). The overall predictive accuracy of the full model (72.4%) was only slightly higher than the accuracy for the first block (70.5%).

Table 59

Hierarchical Logistic Regression: Incremental Predictive validity of the Gender Neutral Indicators Over and Above the Female Salient/Specific Indicators.

Indicator	*B*	*SE*	Wald	Odds Ratio	95% *CI*
Block 1					
Female Salient/Specific Indicators					
Has learning disabilities	-0.04	0.30	0.02	0.96	0.53 – 1.72
Has dental problems	0.73	0.22	10.93**	2.06	1.34 – 3.17
Manipulative	0.71	0.18	15.12***	2.04	1.42 – 2.92
Prescribed medication in the past	0.22	0.17	1.58	1.24	0.89 – 1.73
Lacks direction	1.00	0.17	34.75***	2.72	1.95 – 3.79
Nagelkerke R^2	0.15				
Model χ^2 (df = 5)	87.07***				
Block 2					
Female Salient/Specific Indicators					
Has learning disabilities	-0.11	0.31	0.13	0.89	0.48 – 1.65
Has dental problems	0.54	0.23	5.58*	1.71	1.10 – 2.68
Manipulative	0.56	0.20	7.69**	1.74	1.18 – 2.58
Prescribed medication in the past	0.11	0.18	0.36	1.11	0.78 – 1.58
Lacks direction	0.74	0.18	16.83***	2.10	1.47 – 2.99
Gender Neutral Indicators					
Has less than grade 10	0.58	0.17	10.98**	1.78	1.27 – 2.50
Prior substance abuse assessment(s)	0.61	0.23	7.33**	1.84	1.18 – 2.87
Has completed substance abuse treatment	0.27	0.23	1.39	1.31	0.83 – 2.07
Aggressive	0.17	0.22	0.62	1.19	0.78 – 1.81
Negative towards community supervision	0.43	0.31	1.88	1.53	0.83 – 2.81
Nagelkerke R^2	0.21				
Block χ^2 (df = 5)	37.19***				
Model χ^2 (df = 10)	124.25***				

Note. N = 765. *B* represents the coefficient of the constant in the null model. *SE* represents the standard error. Wald represents the Wald chi-square test. *CI* represents the 95% confidence interval. *df* represents the degrees of freedom for the model.
* $p < .05$ ** $p < .01$ *** $p < .001$.

Discussion

The present study explored whether or not risk factors for recidivism among adult male and female offenders would be the same—gender neutral, stronger for one gender versus the other—gender salient, or only relevant for one gender but not the other—gender specific. The risk factors examined in the present study consisted of various aspects of the Dynamic Factors Identification and Analysis (DFIA) instrument. The DFIA is a component of the Offender Intake Assessment (OIA) used to assess the needs of offenders in federal incarceration. The DFIA is divided into seven domain areas (employment, associates, marital/family, substance abuse, community functioning, personal/emotional, attitude) and consists of a total of 197 indicators (yes/no questions) which are used to generate scores and need levels for each of the domains and the overall DFIA intervention level. The total DFIA intervention level, domain level, and the indicator level served as the risk factors in the present study. Specifically, three variables were examined at the total level of the DFIA and were operationalized as the complete total DFIA score (summation of all the positively endorsed indicators), the optimal total score (non-significant indicators deleted), and the three-level total intervention need level rating provided by parole officers. The three variables explored at the domain level were operationalized as the complete domain scores (summation of positively endorsed indicators within each domain), the optimal domain scores (non-significant domain indicators deleted), and the domain need level ratings (three or four-level rating provided by parole officers). Finally, the indicator level was operationalized as the individual indicators contained within the DFIA measure.

The present study consisted of 765 female offenders and 765 male offenders derived from an archival database provided by the Correctional Services of Canada. The DFIA was conducted as part of the OIA for each offender upon entering a federal correctional institution and a three-year fixed follow-up timeframe was used to evaluate recidivism—operationalized as a readmission to federal custody either pre or post warrant expiry. As hypothesized, evidence for gender saliency and or specificity only emerged when the predictor variables were highly precise—thus when the predictors were measured at the indicator level of the DFIA. In contrast, when the predictor variables were operationalized in a global manner, such as the total score reflective of the entire DFIA measure or the domain score reflective of a component (e.g., employment) of the DFIA, gender specificity did not emerge.

Hypothesis 1 Findings

Hypothesis 1 postulated that the complete total score, optimal total score, and total need level rating would predict recidivism equally for male and female offenders, thus emerging as gender neutral predictors of recidivism. In both the disaggregate and aggregate approach, the findings of the present study supported hypothesis 1 as the total DFIA level predicted recidivism similarly for both men and women. Hypothesis 1 was first tested through a disaggregate approach using ROC analysis and logistic regression analyses for males and females separately. Following this, the first hypothesis was also tested using an aggregate approach with gender explored as a moderating variable through hierarchical logistic regression. In the disaggregate approach, both ROC analysis and logistic regression analysis revealed that the DFIA complete total score, the optimal total score, and the overall need level predicted recidivism similarly for both male and

female offenders. This converged with the findings from the aggregate approach as gender was not identified to moderate the relationship between recidivism and the complete total score, optimal total score, or the total need level rating.

Although past research examining the DFIA measure has not explored the differential predictive validity of the overall DFIA total and need levels based on gender, the findings in the present study are similar to the results obtained by Brown and Motiuk (2005). In their research, Brown and Motiuk (2005) found that higher DFIA need levels were significantly associated with increased rates of recidivism for both male and female offenders. In other research, scholars have identified that other risk assessment tools with need areas similar to the DFIA domains demonstrate similar estimates of predictive validity for male and female offenders. For example, the effect of the LSI risk assessment tools with regard to recidivism has been found to be similar across samples of male and female offenders (Gendreau, Little, & Goggin, 1996; Gendreau, Goggin, & Law, 1997; Gendreau, Goggin, & Smith, 2002; Smith, Cullen, & Latessa, 2009; Lowenkamp, Holsinger, & Latessa, 2001).

Overall, support was provided for hypothesis 1 as the overall DFIA level was identified as a gender neutral predictor of recidivism. Each of the total scores and need level rating for the total DFIA level were found to predict recidivism similarly for men and women. Gender neutrality was anticipated as it was expected that the global DFIA measure would mask the differential influence exerted by the individual indicators on the prediction of recidivism for gender.

Hypothesis 2 Findings

It was predicted in hypothesis 2 that the complete domain scores, optimal domain scores, and domain need level ratings would predict recidivism equally for male and female offenders. Specifically, the domain level of the DFIA was predicted to emerge as a gender neutral predictor of recidivism. In both the disaggregate and aggregate approach, the findings of the present study supported hypothesis 2 as the domain level predicted recidivism similarly for both men and women. The second hypothesis was tested first using a disaggregated approach by gender with ROC analysis and logistic regression to identify the predictive validity of the domain scores and need level ratings. An aggregate analysis was also employed using hierarchical logistic regression to test gender as a moderating variable in the relationship between recidivism and each of the domain scores and need levels. Through the disaggregate approach, ROC analysis and logistic regression analysis revealed all of the complete domain scores, optimal domain scores, and most of the domain need levels to predict recidivism similarly for male and female offenders. The exception to this was the community functioning domain need level which was significantly predictive of recidivism for male offenders, but not for female offenders.

Similar findings were obtained through the hierarchical logistic regression analyses. First, each of the complete domain scores, optimal domain scores, and domain need level ratings were significant predictors of recidivism except the community functioning domain need level. Additionally, when exploring gender as a moderating variable for each of the domain total scores, domain optimal total scores, and domain need level ratings, gender was only found to moderate the relationship between recidivism and the optimal employment domain score. It was found that as the

employment optimal domain score increases, the probability of recidivism increases more for women than for men. More specifically, this interaction effect was only observable at high levels of the employment optimal score. Thus, it appears that recidivism rates increase more for women only when employment is a high need area, as reflected by a high optimal employment score. However, this finding should be interpreted with caution as the odds ratio for the interaction was small and the confidence interval contained the value of one after rounding to two decimal places. It is likely that with the large number of analyses conducted in the present study, the significant interaction between the optimal employment domain score and gender was possibly obtained through chance.

As past research has identified that structured risk assessment tools generally predict recidivism more accurately than professional judgment (e.g., Andrews et al., 2006; Campbell et al., 2009), it was anticipated that the complete and optimal scores for both the total level and the domain level would be better predictors of recidivism than the subjective need level rating provided by parole officers. As expected, the AUC coefficients obtained through ROC analysis for the complete and optimal scores for both the total and domain level were identified to be larger than the need level ratings. However, logistic regression analysis revealed findings counter to these expectations as the total and domain need level ratings consistently demonstrated a larger effect of recidivism through the aggregate and disaggregate approach than the complete or optimal scores for both the total and domain level. However, an explanation for this finding rests in the mechanism for calculating an odds ratio. As the change in odds of recidivism is based on a one unit change in the predictor variable, a predictor variable with a larger

number of units would result in a decrease in the value of the odds ratio relative to the odds ratio of a predictor variable with a smaller number of units. Thus, the complete and optimal scores which are comprised of several units of change would generate a smaller odds ratio than the need level ratings which range from only 3 to 4 units of change.

Overall, support was identified for hypothesis two as the majority of the domain scores and need levels were deemed to be gender neutral predictors of recidivism. With the exception of the significant interaction identified for the employment optimal domain score, gender neutrality was identified for the remaining DFIA complete domain scores, optimal domain scores, and domain need level ratings. Gender neutrality was expected to be identified at the domain level as the overall construct for each domain was anticipated mask the influence of the individual indicators comprised within each domain.

The findings for hypothesis two are consistent with past research that has identified risk factors similar to the DFIA domains to predict recidivism for both male and female offenders (e.g. Benda, 2005; Farrington & Painter, 2004; Gendreau et al., 1996; Rettinger & Andrews, 2010; Simourd & Andrews, 1994; Van Voorhis et al., 2010). Additionally, the present findings are similar to the results presented by Brown and Motiuk (2005), demonstrating a significant association between the domain need level ratings and recidivism for both men and women. Specifically, Brown and Motiuk (2005) identified a linear relationship between each of the domain need levels and recidivism for men and women, excluding the domains marital/family, community functioning, and employment, which were not always linearly related with recidivism for women. Brown and Motiuk (2005) found that each increase in the employment need level (consisting of four need levels) for women corresponded to an increase in the rate of recidivism except

at the third need level identified as 'some difficulty'. Thus, it is possible that compared to men, different values for the optimal employment domain score correspond to larger increases in the rate of recidivism for female offenders, revealing the optimal employment domain score to predict recidivism saliently for women. However, although the interaction was significant, this finding should be interpreted with caution as the confidence interval closely approached the value of one.

Hypothesis 3 Results

The third hypothesis postulated that evidence for gender saliency or specificity would be identified at the indicator level of the DFIA. Specifically, it was anticipated that some of the DFIA indicators would predict recidivism saliently or specifically for one gender over the other. The third hypothesis was tested using logistic regression examining males and females separately, and using hierarchical logistic regression examining males and females combined. Based on the results, the third hypothesis was supported as gender neutrality as well as gender saliency and gender specificity emerged at the DFIA indicator level.

After eliminating the indicators not suitable for the analysis (i.e., those with a proportional split in excess of 90%-10% for both genders), a total of 158 indicators were examined in the present study. Of these indicators which were significantly predictive of recidivism for at least one gender (n = 129), 52 (40%) were identified as gender neutral, 5 (4%) were identified as male salient, 35 (27%) were identified as female salient, 9 (7%) were identified as male specific, and 28 (22%) were female specific.

When looking at the indicators found to predict recidivism through the disaggregate logistic regression analyses, several indicators were identified as gender

neutral. Specifically, the indicators emerging as gender neutral predictors included 8 of the 20 employment indicators (40%), 2 of the 6 associates indicators (33%), 8 of the 18 marital/family indicators (44%), 12 of the 29 substance abuse indicators (41%), 6 of the 10 community functioning indicators (60%), 10 of the 29 personal/emotional indicators (38%), and 6 of the 17 attitude indicators (35%).

Several indicators were identified as gender salient through the disaggregate logistic regression analyses as well. Interestingly, a higher proportion of indicators were identified as female salient compared to those identified as male salient for most of the DFIA domains. For example, of the 20 employment indicators, 2 were identified as female salient and only 1 was identified as male salient. With regard to the associates domain, three of the six associates indicators were found to be female salient, and none were male salient. Interestingly, for the 18 marital/family indicators, none were identified as female or male salient. Of the 29 substance abuse indicators, 15 were identified as female salient and 2 were identified as male salient. For the community functioning domain, only one of the ten was identified as female salient and none were identified as male salient. Of the 29 personal/emotional indicators, 7 were identified as female salient and only 1 was a male salient predictors. Finally, of the 17 attitude indicators, 7 were female salient and 2 were male salient.

A similar trend was observed through the disaggregate approach with regard to gender specific predictors of recidivism; more female specific indicators were identified than male specific indicators. With regard to the 20 employment indicators, 9 were identified as female specific and only 1 was identified as male specific. Of the associates domain, one of the six associates indicators was found to be female specific, and none

were male specific. For the 18 marital/family indicators, 7 were identified as female specific and 3 were male specific. Of the 29 substance abuse indicators, none were found to predict recidivism specifically for female or male offenders. For the community functioning domain, three of the ten indicators were identified as female specific and none were identified as male specific. Of the 29 personal/emotional indicators, 6 were identified as female specific and 5 were identified as male specific. Lastly, of the 17 attitude indicators, 2 were female specific and none were male specific.

The finding that more female salient or specific indicators were consistently identified compared to male salient or specific indicators is interesting. The DFIA tool was developed using a primarily gender neutral lens and based primarily on factors thought to be important for male crime. Thus, the finding that relatively few of the indicators emerged as salient or specific to men is unexpected. Contrary to this, the higher proportion of female salient or specific indicators is interesting given that the DFIA tool was generated for male offenders. Thus the evidence provides some support for theories postulating that some risk/need factors are particularly important for women. Further research examining the predictive validity of factors derived from an entirely female-centered need assessment tool is required to fully understand the influence of female salient or specific risk factors.

The findings from the disaggregate approach primarily converged with the results of the aggregate approach. Through the hierarchical logistic regression analyses, some of the indicators identified as salient or specific were also found to be moderated by gender. Through the hierarchical logistic regression analyses, a total of 13 indicators were found

to significantly interact with gender, generally demonstrating similar results to the findings obtained through the disaggregate logistic regression analyses.

For the male offender sample, four of the indicators identified as male salient or specific in the disaggregate analysis (father absent during childhood, currently single, goal setting unrealistic, and non-conforming) were also found to significantly interact with gender in the aggregate analyses. Specifically, these findings demonstrate that compared to women, the probability of recidivism increases more for men who score 'yes' on these indicators. Interestingly, some of the relational aspects through the marital/family domain proposed to be particularly important to females were found to be significant predictors of recidivism for men (i.e., father absent during childhood, currently single).

For the female offender sample, five of the indicators identified as female salient or specific in the disaggregate analysis (unable to handle parenting responsibilities, abuses alcohol, has participated in substance abuse treatment, lacks direction, and has dental problems) were also found to significantly interact with gender in the aggregate analyses. Thus, compared to men, the probability of recidivism increases more for women who score 'yes' on these indicators. The substance abuse indicators (abuses alcohol, has participated in substance abuse treatment) provide support for the feminist pathways theory as well as other past research. Some of the pathways outlined by Daly (1992) in the feminist pathways framework identify that women involved in the justice system often begin using substances as a means to cope or survive with their experiences or situations. Additionally, other research has identified that substance abuse is a stronger predictor of recidivism for women compared to men (e.g., Andrews et al.,

unpublished manuscript; McClellan et al., 1997). With regard to the parenting indicator (unable to handle parenting responsibilities), some scholars have identified parenting responsibilities to be a particularly important need are for women (Bloom et al., 2003; Van Voorhis & Presser, 2001). As it has been identified that single mothers are often living in poverty (Bloom et al., 2003), it is possible that a lack of resources could influence women to commit crimes in order to provide for their children.

Additionally, a few of the indicators identified as not significantly predictive of recidivism or as gender neutral predictors in the disaggregate approach were found to be moderated by gender in the aggregate approach. This included the indicators 'has an unstable job history', 'has no parenting responsibilities', and 'has completed substance abuse treatment', which all significantly interacted with gender and demonstrated that the probability of recidivism increased more for women who scored 'yes' on these indicators compared to men. The finding that the indicator 'has no parenting responsibilities' is a predictor of recidivism provides support for the relational aspects outlined in past theories such as relational-cultural theory (RCT; Miller, 1976). RCT illustrate the important benefits of connectedness and relatedness for women to achieve healthy personal development. Interestingly, although having no parenting responsibilities is predictive of recidivism for women, being unable to handle parenting responsibilities was also previously identified as predictive of recidivism for women. Thus, having children appears to serve as a potential protective factor unless the mother is unable to handle these responsibilities.

With regard to the indicator 'has completed substance abuse treatment' which was moderated by gender, this finding was expected as substance abuse was consistently

found to be a strong predictor of recidivism for women and for men at the domain level of the DFIA. Furthermore, the finding that substance use behavior is associated with recidivism is consistent with the feminist pathways theory outlined by Daly (1992) and with past research identifying substance use to be an important risk factor for female offenders (e.g., Andrews et al., unpublished manuscript; McClellan et al., 1997)

With regard to the indicators explicitly predicted in hypothesis three to demonstrate male or female saliency/specificity, one of the six indicators (non-conforming) expected to predict recidivism saliently or specifically for male offenders was confirmed as a male salient indicator. Conversely, four of the indicators in the associates and attitude domains expected to predict recidivism for male offenders were found to predict recidivism saliently for female offenders (associates with substance abusers, mostly criminal friends, negative towards the law, and employment has no value). As attitudes and associates are captured within the 'big four' global need areas (Andrews, Bonta, et al., 1990), which have been identified to be strong predictors for both male and female offenders (e.g., Andrews & Dowden, 2006; Dowden & Andrews, 1999), it was anticipated that these indicators would be significant predictors of recidivism but not expected to be stronger predictors for women compared to men.

Of the indicators expected to predict recidivism saliently or specifically for female offenders, two of the nine indicators (has been a victim of spousal abuse, unable to handle parenting responsibilities) predicted recidivism specifically for females and three (drinking has resulted in law violations, has participated in substance abuse treatment, and copes with stress poorly) predicted saliently for females. One of the suspected female salient/specific indicators (diagnosed as disordered in the past) was

found to predict recidivism saliently for male offenders while the remaining indicators were identified as gender neutral predictors of recidivism. These female specific and female salient indicators are all consistent with the factors outlined through the feminist pathways theory (Daly, 1992). In addition to outlining the coping strategies used by women in stressful adverse life situations (e.g., substance use), one of the feminist pathways identified by Daly (1992) illustrates that women in abusive relationships sometimes become involved in the justice system only after a violent act of self-defence or after retaliating against their violent partner. The indicator 'has been a victim of spousal abuse' as a significant predictor of recidivism for women coincides with this pathway. Interestingly, indicators related to mental health factors, as proposed through RCT and identified in past research to be important predictors of recidivism for women (e.g., Benda, 2005), did not emerge as significant for females. However, it is possible that the mental health aspects found to be important to women, such as anxiety or depression (Van Voorhis et al., 2010), were not captured in the male-based DFIA measure.

Although research specifically examining the DFIA indicators is limited, the results for hypothesis three are generally consistent with past findings. Brown and Motiuk (2005) found significant correlations between several of the DFIA indicators and a readmission to custody. Additionally, it was found that some indicators accounted for a proportion of the variance in recidivism similarly for men and women (e.g. has unstable accommodation), and some indicators accounted for a proportion of variance differently for men and women (e.g. has less than grade 10) (Brown & Motiuk, 2005).

Exploratory Analysis: Incremental Predictive Validity

The incremental predictive validity was examined through hierarchical logistic regression for both the most strongly predictive gender neutral indicators and the most strongly predictive gender salient/specific indicators for female offenders. When the incremental predictive validity was examined for the female offenders, three female salient/specific indicators (has dental problems, manipulative, and lacks direction) were found to predict recidivism when entered either first or last into the logistic regression model with the gender neutral indicators. Furthermore, two gender neutral indicators (has less than grade 10 and prior substance abuse assessments) were found to predict recidivism above and beyond the female salient/specific indicators.

With regard to the female salient/specific indicator 'has dental problems', it is possible that this indicator may be symptomatic of other life situations leading women to engage in crime. More specifically, dental problems may actually serve as a proxy to recidivism as other factors may mediate the apparent relationship between dental problems and recidivism. For instance, it may be possible that economic disparity, which may contribute to recidivism, could result in a lack of resources for women to adequately care for their teeth. Additionally, it is also possible that dental problems could be symptomatic of substance abuse issues, which may also directly relate to criminal behavior. Thus, further research should examine other variables as potential mediating factors to elucidate the manner in which dental problems are associated with recidivism.

The female salient/specific DFIA indicator 'manipulative' is similar to an item also included in the Psychopathy Checklist-Revised (PCL-R; Hare, 2003). Specifically, the 'manipulative' item in the PCL-R is found within the first factor of the PCL-R measure examining the interpersonal and affective features central to psychopathy.

Importantly, the first factor of the PCL-R has been found to predict recidivism more for females whereas the second factor, relating to antisocial behavior, tends to predict recidivism more males (Richards et al., 2003). Thus, the finding of the indicator 'manipulative' is consistent with past research examining similar items and demonstrates that the affective or relational components of criminal behavior may be more important to female crime.

Finally, the female salient/specific indicator 'lacks direction' may be perceived as a fundamental cognitive factor. Without a sense of direction, multiple areas of one's life could be negatively impacted. Thus it is possible that this variable serves as an indicator that other factors leading to recidivism are present. For example, without a concrete sense of direction for employment pursuits or even the values or attitudes one should adopt, decisions may be made that lead to antisocial behaviours. Therefore, other variables may mediate this apparent relationship and should be explored to elucidate the association between lacking direction and recidivism.

Overall, some of the findings in the exploratory analyses were found to converge with the results obtained in hypothesis three examining the influence of gender at the indicator level. Some of the gender salient/specific indicators identified through the hierarchical logistic regression in the exploratory analysis to most strongly predict recidivism over and above the gender neutral indicators were also found in both the disaggregate and aggregate analysis for hypothesis three. Specifically, the indicators continuing to emerge as significant predictors for women were 'has dental problems' and 'lacks direction'.

The findings in the present study are generally consistent with past research exploring the incremental predictive validity for women. Van Voorhis et al. (2010) identified that the inclusion of gender responsive risk factors into a model consisting of proposed gender neutral variables resulted in a model more predictive of recidivism than one with gender neutral variables alone. Some of the gender responsive risk factors identified by Van Voorhis et al. (2010) to predict recidivism after partialing out the gender neutral factors were substance abuse, parental needs, economic factors, educational factors, mental health needs, interpersonal relationships, and trauma and victimization. Additionally, similar to the findings obtained by Van Voorhis et al. (2010), the female salient/specific indicators were found to improve the overall model and the prediction of recidivism when entered into the model with the gender neutral indicators.

However, the findings of the present study were found to diverge with the results obtained by Rettinger and Andrews (2010). In their study, Rettinger and Andrews (2010) examined proposed gender responsive risk factors including socioeconomic class, poverty, abuse, parenting concerns, emotional distress, and physical health aspects. None of the examined gender responsive risk factors in their study were found to add incrementally to the predictive validity of the LSI-R. However, the authors note some potential limitations that are similar to those in the present study, which may have also limited the number of indicators demonstrating incremental predictive validity in the present study. These limitations included the use of an archival database centered primarily on binary outcomes, which may contribute to a loss of important information.

The authors suggest the possibility that the binary variables may have failed to capture the essence of female salient or specific risk factors.

The results of the present study also diverged from the findings obtained by Holtfreter et al. (2004). Holtfreter et al. (2001) found that when the proposed female salient risk factor of economic marginalization, as measured by poverty, was entered into a model with the proposed gender neutral LSI-R measure, the full model explained a larger proportion of the variance in recidivism (55%) than when the LSI-R was examined in the model alone (30%). However, in the present study, only one indicator for the female sample identified as significant in the exploratory analysis was related to the employment domain (has less than grade 10). Additionally, this indicator was identified as a gender neutral predictor, rather than a female salient/specific indicator. It is important to note however, that the indicators contained within the DFIA employment domain may not directly represent poverty as was measured in the study by Holtfreter et al. (2001).

The findings obtained for the indicator level of the DFIA provide support for the supposition that when risk factors are measured using an all-encompassing global approach, such as the total DFIA measure or the overarching domain areas, the influence of the individual indicators is masked. It is only when the risk factors were broken down into specific individual factors that gender differences emerged. Furthermore, this finding remained true even when the more stringent approaches of moderated logistic regression with the aggregate sample and hierarchical logistic regression assessing the incremental predictive validity were used.

Limitations

A primary limitation in the present study is that although the DFIA contains a large number of indicators approximating the theorized gender salient and specific risk factors, the DFIA was developed using a primarily gender neutral lens and primarily for male offenders. Thus, the identified female specific or salient indicators identified in the DFIA are ultimately based on a gender neutral perspective. The use of the DFIA measure limits the exploration of female salient or specific factors to indicators within a tool developed essentially for men. For example, trauma or abuse which is theorized to be a particularly important factor in female crime, is not specifically identified in the DFIA, but is represented indirectly through some of the dysfunctional family/marital indicators. As a result, it is possible that the existing DFIA indicators may not truly capture the essence of the theorized female salient of specific risk factors. To better assess the influence of gender responsive factors for female offenders, future studies should explore a measure built entirely from the ground up for women and based on the factors identified as important to female crime through the gender responsive literature.

Another limitation in the present study is the measure used to identify recidivism. Recidivism rates were based on re-admission to a federal institution either pre- or post-warrant expiry, which could potentially lead to an underestimation of the rate of recidivism. For example, recidivistic acts committed by offenders who were released upon their warrant expiry date may not necessarily result in a return to federal custody. Thus information about arrest rates, conviction rates, or even re-admission to provincial institutions was not available for these offenders. However, as offenders are generally released to the community prior to their warrant expiry date to allow for a period of supervision in the community, any arrests would have resulted in a return to federal

custody. As a result, although it is possible that the true rate of recidivism may be underestimated, it is likely that the identified recidivism rate approximated the actual rate of recidivism. However, future studies should consider examining various samples of offenders to attain a complete representation of criminal recidivism.

Another factor to consider is that because dynamic needs are alterable, assessments closely preceding a recidivistic act may capture the key contributing criminogenic factors more accurately than assessment completed in the past. Because the DFIA is completed on only one occasion rather than successively following the release of an offender from federal incarceration, the results may not accurately reflect the key risk factors for recidivism. To ensure the key factors relating to recidivism are identified, future research should consider multiple re-assessments to capture the dynamic nature of potential risk factors.

Conclusion

Overall, using rigorous statistical methods and a stringent statistical approach, evidence for gender saliency and specificity was identified. As was expected, the results of the present study demonstrated that gender neutrality prevailed at the total and domain level of the DFIA. However, gender saliency or specificity emerged at the indicator level for both male and female offenders. Some of the indicators emerging as important predictors for women included family aspects, such as having no children or being unable to handle the responsibilities of parenting. Other indicators identified as particularly important to women included lacking direction and experiencing dental problems. And although many of the substance abuse indicators were found to be significant predictor for both men and women, a few of the indicators were found to be particularly important

for women. These indicators included abusing alcohol, participating in substance abuse treatment, and completing substance abuse treatment.

These indicators provide some support to the feminist pathways theory (Daly, 1992). For example, the feminist pathway theory depicts a set of interrelated factors, beginning with negative experiences at home (e.g., abuse) leading to women to become involved in substance use behaviour and experiencing mental health issues, physical health issues, and economic hardship. The findings in the present study did not identify abuse as a predictor of recidivism for women because of the lack of indicators within the DFIA specifically targeting abusive experiences. However, there was some indication of substance abuse problems and an inability to physically care for oneself (dental problems) or care for their children, which were related to recidivism for women. Although some indicators were salient or specific predictors for women, it is possible that stronger findings would emerge with an assessment tool built specifically to examine the variables proposed through the feminist pathways theory.

In the present study, limited support was identified for economic factors as unique predictors of recidivism for women. As postulated through the liberation and economic marginalization theory (Hunnicutt & Broidy, 2004), aspects of employment are some of the factors contributing to economic conditions that are thought to influence female criminal offending behaviour. In the present study, only one employment indicator emerged as significantly predictive of recidivism for women through some of the more stringent analyses (unstable job history). However, when this variable was examined separately for males and females, it was found to be an important gender neutral predictor

for both genders. Overall, limited support was provided for the economic factors theorized to be important predictors of female crime.

Although the present study identifies support for female salient and specific predictors of recidivism, more research is needed to examine theorized female salient or specific risk factors using tools designed specifically for women. By moving away from exploring gender differences through primarily male-centered assessment tools, more evidence may be identified for female salient or specific risk factors. By gaining a greater understanding of the risk factors most important to female offenders, risk tools may be further refined to more accurately predict recidivism for women. Furthermore, the knowledge of the risk factors most important to female recidivism could ultimately serve to inform treatment programs to target the needs that are most strongly associated with recidivism. Through understanding the variety of female responsive risk factors and their interrelatedness, treatment may be better tailored to reduce the risk of recidivism for women.

References

Aguinis, H., & Stone-Romero, E. F. (1997). Methodological artifacts in moderated multiple regression and their effects on statistical power. *Journal of Applied Psychology, 82*, 192-206.

Andrews, D. A. (1980). Some experimental investigations of the principles of differential association through deliberate manipulations of the structure of service systems. *American Sociological Review, 45*, 448-462.

Andrews, D. A. (1982). *A Personal, Interpersonal, and Community-Reinforcement (PIC-R) perspective on deviant behaviour.* Toronto, ON: Ministry of Correctional Services.

Andrews, D. A., Bonta, J., & Hoge, R. D. (1990). Classification for effective rehabilitation: Rediscovering psychology. *Criminal Justice and Behavior, 17*(1), 19-52.

Andrews, D. A., & Bonta, J. (2006). *The psychology of criminal conduct* (4th ed.). Newark, NJ: Anderson.

Andrews, D. A., & Bonta, J. (1995). *The level of service inventory – revised.* Toronto: Multi-Health Systems.

Andrews, D. A., Bonta, J., & Wormith, J. S. (2004). *The Level of Service/Case Management Inventory (LS/CMI): Users manual.* Toronto, ON: Multi-Health Systems.

Andrews, D. A., Bonta., J., & Wormith, J. S. (2006). The recent past and near future of risk and/or need assessment. *Crime and Delinquency, 52*, 7-27.

Andrews, D. A., & Dowden, C. (2006). Risk principle of case classification in correctional treatment: A meta-analytic investigation. *International Journal of Offender Therapy and Comparative Criminology, 50*, 88-100.

Andrews, D. A., & Kiessling, J. J. (1980). Program structure and effective correctional practices: A summary of the CaVIC research. In R. R. Ross & P. Gendreau (Eds.). *Effective correctional treatment* (pp. 439-463). Toronto: Butterworths.

Andrews, D. A., Guzzo, L., Raynor, P., Rowe, R., Rettinger, L. J., Brews, A., & Wormith. J. S. (2010). *Are the major risk/need factors predictive of both female and male reoffending? A test with the eight domains of the Level of Service/Case Management Inventory.* Unpublished manuscript.

Andrews, D. A., Zinger, I., Hoge, R. D., Bonta, J., Gendreau, P., & Cullen, F. T. (1990).

Does correctional treatment work? A clinically relevant and psychologically informed meta-analysis. *Criminology, 28*(3), 369-404.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Belknap, J. (2007). *The invisible women: Gender, crime and justice* (3rd Ed.). Belmont, CA: Thomson Wadsworth.

Belknap, J., & Holsinger, K. (2006). The gendered nature of risk factors for delinquency. *Feminist Criminology, 1*(1), 48-71.

Benda, B. B. (2005). Gender differences in life-course theory of recidivism: A survival analysis. *International Journal of Offender Therapy and Comparative Criminology, 49*, 325-342.

Blanchette, K. D., & Brown, S. L. (2006). *The assessment and treatment of women offenders: An integrative perspective.* Chichester: John Wiley & Sons.

Bloom, B., Owen, B., & Covington, S. S. (2003). *Gender-responsive strategies: Research, practice, and guiding principles for women offenders* (NIC Accession Number 018017). Retrieved June 19, 2009 from http://www.nicic.org/pubs/2003/018017.pdf

Bloom, B., Owen, B., & Covington, S. (2005). *Gender-responsive strategies for women offenders: A summary of research, practice, and guiding principles for women offenders.* Washington, DC: National Instituted of Corrections.

Bloom, B., Owen, B., Deschenes, E. P., & Rosenbaum, J. (2002). Improving juvenile justice for females: A statewide assessment in California. *Crime and Delinquency, 48*(4), 526-552.

Bonta, J., & Andrews, D. A. (2007). Risk-need-responsivity model for offender assessment and rehabilitation (2007-06). Ottawa, Ontario: Public Safety Canada.

Bonta, J., Law, M., & Hanson, R. K. (1998). The prediction of criminal and violent recidivism among mentally disordered offenders: A meta-analysis. *Psychological Bulletin, 123*(2), 123-142.

Bonta, J., Pang, B., & Wallace-Capretta, S. (1995). Predictors of recidivism among incarcerated female offenders. *The Prison Journal, 75*, 277-294.

Brown, S. L. & Motiuk, L. L. (2005). *The Dynamic Factors Identification and Analysis (DFIA) component of the Offender Intake Assessment (OIA) process: A meta-analytic, psychometric and consultative review.* Report R-164 (Ottawa: Correctional Service Canada).

Brown, S. L. & Motiuk, L. L. (2008, June). *Using dynamic risk factors to predict criminal recidivism in a sample of male and female offenders*. Paper presented at the 69th Annual Convention of the Canadian Psychological Association. Halifax, Nova Scotia, Canada.

Campbell, M. A., French, S., & Gendreau, P. (2009). The prediction of violence in adult offenders: A meta-analytic comparison of instruments and methods of assessment. *Criminal Justice and Behavior, 36*, 567-590.

Chesney-Lind, M., & Paramore, V. V. (2001). Are girls getting more violent? *Journal of Contemporary Criminal Justice, 17*, 142-166.

Chesney-Lind. M., & Shelden, R. G. (2004). *Girls, delinquency, and juvenile justice*. (3rd ed.). Belmont, CA: Wadsworth/Thomson.

Correctional Service Canada (2007). *Organization*. Retrieved May 7, 2010 from http://www.csc-scc.gc.ca/text/organi-eng.shtml

Daly, K. (1992). Women's pathways to felony court: Feminist theories of lawbreaking and problems of representation. *Southern California Review of Law and Women's Studies, 2*(1), 11-52.

Department of Justice Canada. (2008). *Sexual abuse and exploitation of children and youth: A fact sheet from the Department of Justice* Canada. Retrieved May 21, 2009 from http://www.justice.gc.ca/eng/pi/fv-vf/facts-info/sex_abu.pdf

Dowden, C. (1998). *A meta-analytic examination of the Risk, Need and Responsivity principles and their importance within the rehabilitation debate* (Master's thesis). Available from ProQuest Dissertations and Theses database. (AAT MQ36817).

Dowden, C., & Andrews, D. A. (1999). What works for female offenders: A meta-analytic review. *Crime and Delinquency, 45*, 438-452.

Dowden, C., & Andrews, D. A. (2000). Effective correctional treatment and violent reoffending: A meta-analysis. *Canadian Journal of Criminology, 42*, 449-467.

Dowden, C., & Brown, S. L. (2002). The role of substance abuse factors in predicting recidivism: A meta-analysis. *Psychology, Crime & Law, 8*, 243-264.

Farr, K. A., (2000). Classification of female inmates: Moving forward. *Crime and Delinquency, 46*, 3-17.

Farrington, D. P., & Painter, K. A. (2004). *Gender differences in offending: Implications for risk-focused prevention*. London: Home office. Retrieved May 18, 2009, from http://www.homeoffice.gov.uk/rds/pdfs2/rdsolr0904.pdf

Finkelhor, D. (1994). Current information on the scope and nature of child sexual abuse. *Future Child, 4*(2), 31.53.

Foley, A. (2008). The current state of gender-specific delinquency programming. *Journal of Criminal Justice, 36*, 262-269.

Frazier, P. A., Tix, A. P., Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counselling Psychology, 51*, 115-134.

Funk, S. J. (1999). Risk assessment for juveniles on probation: A focus on gender. *Criminal Justice and Behavior, 26*, 44-68.

Gaarder, E., & Belknap, J. (2004). Little women: Girls in adult prison. *Women and Criminal Justice, 15(2)*, 5-80.

Gates, M., Dowden, C., & Brown, S. L. (1998). Case need domain: "Community functioning". *Forum on Corrections Research, 10*(3), 16-19.

Gendreau, P., Little, T., & Goggin, C. (1996). A meta-analysis of the predictors of adult offender recidivism: What works! *Criminology, 34*, 575-607.

Glueck, S., & Glueck, E. (1950). *Unraveling Juvenile Delinquency*. Cambridge, Mass: Harvard University Press.

Grann, M., & Wedin, I. (2002). Risk factors for recidivism among spousal assault and spousal homicide offenders. *Psychology, Crime & Law, 8*, 5-23.

Green, L. (2006). *Gender influences and methodological considerations in adolescent risk-need assessment: A meta-analysis* (Master's thesis). Available from ProQuest Dissertations and Theses database. (AAT MR46669).

Greenfeld, L. A., & Snell, T. L. (1999). *Women offenders*. Bureaus of Justice Statistics: Special Report. U.S. Department of Justice.

Haddock, C. K., Rindskopf, D., & Shadish, W. R. (1998). Using odds ratios as effect sizes for meta-analysis of dichotomous data: A primer on methods and issues. *Psychological Methods, 3*, 339-353.

Hanson, R. K. (2008). What statistics should we use to report predictive accuracy. *Crime Scene: Psychology Behind Bars and in Front of the Bench, 15*(1), 15-17.

Hare, R. D. (2003). *Manual for the revised psychopathy checklist* (2nd ed.). Toronto, ON: Multi-Health Systems.

Hare, R. D., Clark, D., Grann, M., & Thornton, D. (2000). Psychopathy and the

predictive validity of the PCL-R: An international perspective. *Behavioral Sciences and the Law, 18*, 623-645.

Hare, R. D., Hart, S. D., & Harpur, T. J. (1991). Psychopathy and the DSM-IV criteria for antisocial personality disorder. *Journal of Abnormal Psychology, 100*(3), 391-398.

Harris, G. T., Rice, M. E., & Quinsey, V. L. (1993). Violent recidivism of mentally disordered offenders: The development of a statistical prediction instrument. *Criminal Justice and Behavior, 20*, 315-335.

Heilbrun, K., Dematteo, D., Fretz, R., Erickson, J., Yasuhara, K., Anumba, N. (2008). How "specific" are gender-specific rehabilitation needs? An empirical analysis. *Criminal Justice and Behavior, 35*, 1382-1397.

Heimer, K. (2000). *Changes in the gender gap in crime and women's economic marginalization. The nature of crime: Continuity and change*. Retrieved March 19, 2010 from http://www.ncjrs.gov/App/Publications/abstract.aspx?ID=185518

Holtfreter, K., & Cupp, R. (2007). Gender and risk assessment: The empirical status of the LSI-R for women. *Journal of Contemporary Criminal Justice, 23*(4), 363-382.

Holtfreter K., & Morash, M. (2003). The needs of women offenders: Implications for correctional programming. *Women & Criminal Justice, 14*, 137-160.

Holtfreter, K., Reisig, M. D., & Morash, M. (2004). Poverty, state capital, and recidivism among women offenders. *Criminology and Public Policy, 3*, 185-208.

Hubbard, D. J., & Matthews, B. (2008). Reconciling the differences between the "gender-responsive" and the "what works" literatures to improve services for girls. *Crime & Delinquency, 54*(2), 225-258.

Hubbard, D. J., & Pratt, T. C. (2002). A meta-analysis of the predictors of delinquency among girls. *Journal of Offender Rehabilitation, 34*, 1-13.

Humphreys, L. G., & Swets, J. A. (1991). Comparison of predictive validities measured with biserial correlations and ROCs of signal detection theory. *Journal of Applied Psychology, 76*, 316-321.

Hunnicutt, G., & Broidy, L. M. (2004). Liberation and economic marginalization: A reformulation and test of (formerly?) competing models. *Journal of Research in Crime and Delinquency, 41*(2), 130-155.

Jenkins, Y. M. (2004). Toward relational empowerment of women in prison. In M. Walker & W. B. Rosen (Eds.). *How connections heal: Stories from Relational Cultural Therapy* (pp. 216-232). New York: The Guilford Press.

Kazdin, A. E. (2003). *Research design in clinical psychology* (4th ed.). Toronto, ON: Allyn and Bacon.

Kendall, K. (2002). Time to think again about cognitive behavioural programmes. In P. Carlen (Ed.), *Women and punishment: The struggle for justice* (pp. 182-198). Cullompton, Devon: Willian Publishing.

Kong, R., & AuCoin, K. (2008). *Female Offenders in Canada*. Canadian Centre for Justice Statistics: Statistics Canada. (Catalogue No. 85-002-XIE, Vol 28).

Kraemer, H. C., Kazdin, A. E., Offord, D. R., Kessler, R. C., Jensen, P. S., & Kupfer, D. J. (1997). Coming to terms with the terms of risk. *Archives of General Psychiatry, 54*, 337-343.

Kropp, P. R., Hart, S. D., Webster, C. D., & Eaves, D. (1995). *Manual for the Spousal Assault Risk Assessment guide* (2nd ed.). Vancouver, BC: The British Columbia Institute on Family Violence.

Landau, S., & Everitt, B. S. (2004). *A handbook of statistical analyses using SPSS*. New York: Chapman & Hall/CRC Press LLC.

Law, M. (1998). Case need domain: "Attitude". *Forum on Corrections Research, 10*(3), 42-45.

Leistico, A. M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. *Law of Human Behaviour, 32*, 28-45.

Lipsey, M. W., & Derzon, J. H. (1998). Predictors of violent or serious delinquency in adolescence and early adulthood: A synthesis of longitudinal research. In R. Loeber & D. P. Farrington (Eds.), *Serious and violent juvenile offenders: Risk factors and successful interventions* (pp. 86-105). Thousand Oaks, CA: Sage.

Loeber, R., & Dishion, T. (1983). Early predictors of male delinquency: A review. *Psychological Bulletin, 94*(1), 68-99.

Lovins, L. B., Lowenkamp, C. T., Latessa, E. J., & Smith, P. (2007). Application of the risk principle to female offenders. *Journal of Contemporary Criminal Justice, 23*, 383-398.

Lowenkamp, C. T., Holsinger, A. M., & Latessa, E. J. (2001). Risk/need assessment, offender classification, and the role of childhood abuse. *Criminal Justice and Behavior, 28*, 543-563.

Lowenkamp, C. T., & Latessa, E. J. (2005). Increasing the effectiveness of correctional

programming through the risk principle: Identifying offenders for residential placement. *Criminology & Public Policy, 4*, 263-290.

McClellan, D. S., Farabee, D., & Crouch, B. M. (1997). Early victimization, drug use, and criminality: A comparison of male and female prisoners. *Criminal Justice and Behavior, 24*, 455-476.

McCormack, A., Janus, M. D., & Burgess, A. W. (1986). Runaway youths and sexual victimization: Gender differences in an adolescent runaway population. *Child Abuse & Neglect, 10*(3), 387-395.

Miller, J. B. (1976). *Towards a new psychology of women.* Boston, MA: Beacon Press.

Miller, J. B., & Stiver, I. P. (1997). *The healing connection: How women form relationship in therapy and in life.* Boston: Beacon Press.

Ministry of Community Safety & Correctional Services (2010). *Correctional services adult offenders: Facilities.* Retrieved May 7, 2010 from http://www.mcscs.jus.gov.on.ca/ english/corr_serv/adult_off/facilities/facilities.html

Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). *Sex difference in antisocial behaviour: Conduct disorder, delinquency, and violence in the Dunedin Longitudinal Study.* Cambridge: Cambridge University Press.

Motiuk, L. L. (1997). Classification for correctional programming: The offender intake assessment (OIA) process. *Forum on Corrections Research, 9(1)*, 18-22.

Motiuk, L. L. (1998). Using dynamic factors to better predict post-release outcome. *Forum on Corrections Research, 10(3)*, 12-15.

Nafekh, M., & Motiuk, L. L. (2002). *The Statistical Information on Recidivism – Revised 1 (SIR-R1 scale: A psychometric examination.* Report R-126 (Ottawa: Correctional Service Canada).

Nuffield, J. (1982). *Parole decision making in Canada: Research towards decision guidelines.* Ottawa, ON: Solicitor General of Canada.

Nunes, K. L., Hanson, R. K., Firestone, P., Moulden, H. M., Greenbert, D. M., & Bradford, J. M. (2007). Denial predicts recidivism for some sexual offenders. *Sex Abuse, 19*, 91-105.

Parker, K. F., & Reckdenwald, A. (2008). Women and crime in context: Examining the linkages between patriarch and female offending across space. *Feminist Criminology, 3*, 5-24.

Pollack, S. (2000). Reconceptualizing women's agency and empowerment: Challenges to self-esteem discourse and women's lawbreaking. *Woman & Criminal Justice, 12*, 75-89.

Reisig, M. D., Holtfreter, K., & Morash, M. (2006). Assessing recidivism risk across female pathways to crime. *Justice Quarterly, 23*(3), 384-405.

Rettinger, J. L., & Andrews, D. A. (2010). General risk and need, gender specificity, and the recidivism of female offenders. *Criminal Justice and Behavior, 37*, 29-46.

Richards, J. J., Casey, J. O., & Lucente, S. W. (2003). Psychopathy and treatment respons in incarcerated female substance abusers. *Criminal Justice and Behaviour, 30*, 251-276.

Rowe, D. C., Vazsonyi, A. T., & Flannery, D. J. (1995). Sex differences in crime: Do means and within-sex variation have similar causes? *Journal of Research in Crime and Delinquency, 32*, 84-100.

Salisbury, E. J., & Van Voorhis, P. (2009). Gendered pathways: A quantitative investigation of women probationers' path to incarceration. *Criminal Justice and Behavior, 36*, 541-566.

Salisbury, E. J., Van Voorhis, P., & Spiropoulos, G. V. (2009). The predictive validity of a gender-responsive needs assessment. *Crime & Delinquency, 55*, 550-585.

Sanchez-Meca, J., Marin-Martinez, F., & Chacon-Moscoso, S. (2003). Effect-size indices for dichotomized outcomese in meta-analysis. *Psychological Methods, 8*, 448-467.

Serin, R., Forth, A., Brown, S., Nunes, K., Bennell, C., & Pozzulo, J. (2010). *Psychology of criminal behaviour: A Canadian perspective.* Toronto, ON: Pearson Canada Inc.

Simourd, L., & Andrews, D. A. (1994). Correlates of delinquency: A look at gender differences. *Forum on Corrections Research, 6*, 26-31.

Smith, P., Cullen, F. T., & Latessa, E. J. (2009). Can 14,737 women be wrong? A meta-analysis of the LSI-R and recidivism for female offenders. *Criminology & Public Policy, 8*, 183-208.

Steffensmeier, D., & Allan, E. (1996). Gender and crime: Toward a gendered theory of female offending. *Annual Review of Sociology, 22*, 459-487.

Steffensmeier, D., Schwartz, J., Zhong, H., & Ackerman, J. (2005). An assessment of

recent trends in girls' violence using diverse longitudinal sources: Is the gender gap closing? *Criminology, 43*, 355-406.

Steffensmeier, D., Zhong, H., Ackerman, J., Schwartz, J., & Agha, S. (2006). Gender gap trends for violent crimes, 1980 to 2003. *Feminist Criminology, 1*, 72 to 98.

Sutherland, E. H. (1947). *Principles of criminology* (4th ed.). Philadelphia: Lippincott.

Tabachnick, B. G., & Fidell L. S. (2007). *Using multivariate statistics* (5th Ed.). Boston: Pearson.

Van Voorhis, P., & Presser, L. (2001). *Classification of women offender: A national assessment of current practices.* Washington, DC: U.S. Department of Justice, National Institute of Corrections.

Van Voorhis, P., Wright, E. M., Salisbury, E., & Bauman A. (2010). Women's risk factors and their contributions to existing risk/needs assessment: The current status of a gender-responsive supplement. *Criminal Justice and Behavior, 37*, 261-288.

Webster, C. D., Douglas, K., Eaves, D., & Hart, D. (1997). *HCR-20: Assessing risk for violence* (Ver. 2). Vancouver, BC, Canada: Mental Health, Law, & Policy Institute, Simon Fraser University.

Appendix A

Dynamic Factors Identification and Analysis
(Brown & Motiuk, 2005)

Employment Domain		
Principal Component	**Sub Component**	**Indicator**
Ability	Education/skills	Has less than grade 8?
		Has less than grade 10?
		Has no high school diploma?
		Finds learning difficult?
		Has learning disabilities?
		Has physical problems that interfere with learning?
		Has memory problems?
		Has concentration problems?
		Has problems with reading?
		Has problems with writing?
		Has problems with numeracy?
		Has difficulty understanding instructions?
		Lacks a skill area/trade/profession?
		Dissatisfied with skill area/trade/profession?
	Health	Has physical problems that interfere with work?
Work record	Work history	Has no employment history?
		Unemployed at the time of arrest?
		Unemployed 90% or more?
		Unemployed 50% or more?
		Has an unstable job history?
		Often shows up late for work?
		Has poor attendance record?
	Performance	Has difficulty meeting workload requirements?
		Lacks initiative?
	Dismissal/departure	Has quit a job without another?
		Has been laid off from work?
		Has been fired from a job?
Rewards	Economic gain	Salary has been insufficient?
		Lacks employment benefits?
	Security	Job lacks security?
Co-worker relations	Quality	Has difficulty with co-workers?
Supervisory	Quality	Has difficulty with superiors?

relations		
Interventions	History	Prior vocational assessment(s)?
		Has participated in employment programs?
		Has completed an occupational development program?

Marital/Family Domain		
Principal Component	**Sub Component**	**Indicators**
Family background	Cohesion	Childhood lacked family ties?
	Maternal relations	Mother absent during childhood?
		Maternal relations negative as a child?
	Paternal relations	Father absent during childhood?
		Paternal relations negative as a child?
	Parental inter-relations	Parent's relationship dysfunctional during childhood?
		Spousal abuse during childhood?
	Sibling relations	Sibling relations negative during childhood?
	Other relative(s) relations	Other relative(s) relations negative during childhood?
	Criminality	Family members involved in crime?
Marital relation	Status	Currently single?
		Has been married/common-law in the past?
	Quality	Dissatisfied with current relationship?
		Money problems affect relationship(s) past/present?
		Sexual problem affect relationship(s) past/present?
		Communication problems affect the relationship(s)?
		Has been a victim of spousal abuse?
		Has been a perpetrator of spousal abuse?
Parenting responsibility	Dependents	Has no parenting responsibilities?
	Parenting skills	Unable to handle parenting responsibilities?
		Unable to control the child's behaviour appropriately?
		Perceives self as unable to control the child's behaviour?

		Supervises child improperly?
		Does not participate in activities with the child?
		Lacks an understanding of child development?
		Family is unable to get along as a unit?
	Child abuse	Has been arrested for child abuse?
		Has been arrested for incest?
Interventions	History	Prior marital/family assessment(s)?
		Has participated in marital/family therapy?
		Has completed a marital/family intervention program?

Associates/Social Interaction Domain		
Principal Component	**Sub Component**	**Indicators**
Attachments	Status	Social isolated?
	Substance abusers	Associates with substance abusers?
	Pro-criminal	Has many criminal acquaintances?
		Has mostly criminal friends?
		Has been affiliated with a gang?
		Resides in a criminogenic area?
	Pro-social	Unattached to any community groups?
Interpersonal relations	Style	Relations are described as predatory?
		Often victimized in social relations?
	Influence	Easily influenced by others?
	Communication	Has difficulty communicating with others?

Substance Abuse Domain		
Principal Component	**Sub Component**	**Indicators**
Alcohol abuse	Pattern	Abuses alcohol?
		Began drinking at an early age?
		Drinks on a regular basis?
		Has history of drinking binges?
		Has combined the use of alcohol and drugs?
	Situations	Drinks to excess during leisure time?

		Drinks to excess in social situations?
		Drinks to relieve stress?
	Interference	Drinking interferes with employment?
		Drinking interferes with marital/family relations?
		Drinking interferes with social relations?
		Drinking has resulted in law violations?
		Drinking interferes with health?
Drug abuse	Pattern	Abuses drugs (solvents, prescription drugs, etc.)?
		Began using drugs at an early age?
		Uses drugs on a regular basis?
		Has gone on drug-taking sprees?
		Has combined the use of different drugs?
	Situations	Uses drugs to excess during leisure time?
		Uses drugs to excess in social situations?
		Uses drugs to relieve stress?
	Interference	Drug use interferes with employment?
		Drug use interferes with marital/family relations?
		Drug use interferes with social relations?
		Drug use has resulted in law violations?
		Drug use interferes with health?
Interventions	History	Prior substance abuse assessment(s)?
		Has participated in substance abuse treatment?
		Has completed substance abuse treatment?

Community Functioning Domain		
Principal Component	**Sub Component**	**Indicator**
Accommodation	Stability	Has unstable accommodation?
	Maintenance	Residence is poorly maintained?
Deportment	Self-presentation	Has poor self-presentation?
	Hygiene	Has poor hygiene?
	Physical	Has physical problems?

	Dental	Has dental problems?
	Nutritional	Has dietary problems?
Finance	Budgeting	Difficulty meeting bills?
		Has outstanding debts?
	Accounts	Has no bank accounts?
	Credit	Has no credit?
	Collateral	Has no collateral?
Communication	Written	Has problems writing?
	Verbal	Unable to express verbally?
Leisure	Hobbies	Has no hobbies?
	Organized activities	Does not participate in organized activities?
Support	Social assistance	Unaware of social services?
		Has used social assistance?
Intervention	History	Prior assessment for community functioning?
		Has participated in a community skills program
		Has completed a community skills program?

Personal/Emotional Domain		
Principal Component	**Sub Component**	**Indicators**
Self-concept	Personal	Feels especially self-important?
		Physical prowess problematic?
	Social-cultural	Family ties are problematic?
		Ethnicity is problematic?
		Religion is problematic?
		Gang member?
Cognition	Cognition	Unable to recognize problem areas?
		Has difficulty solving interpersonal problems?
		Unable to generate choices?
		Unaware of consequences?
		Goal setting is unrealistic?
		Has disregard for others?
		Socially unaware?
		Impulsive?
		Incapable of understanding the feelings of others?
		Narrow and rigid thinking?
Behavioural	Aggression	Aggressive?
	Assertion	Assertion problem?

	Coping	Copes with stress poorly?
		Poor conflict resolution?
		Manages time poorly?
	Gambling	Gambling is problematic?
	Frustration	Has low frustration tolerance?
	Hostility	Hostile?
	Neuroticism	Worries unreasonably?
	Risk taking	Takes risk inappropriately?
	Sensation seeking	Thrill seeking?
	Self-monitoring	Non-reflective?
	Conscientiousness	Is not conscientious?
	Manipulation	Manipulative?
Sexual behaviour	Dysfunction	Has difficulty performing sexually?
	Identity	Sexual identity problem?
	Preference	Inappropriate sexual preferences?
	Attitudes	Sexual attitudes are problematic?
Mental ability	Functioning	Mentally deficient?
Mental health	Disordered	Diagnosed as disordered in the past?
		Diagnosed as disordered currently?
Interventions	Assessments	Prior personal/emotional assessment(s)?
	Medication	Prescribed medication in the past?
		Prescribed medication currently?
	Psychological/psychiatric	Past hospitalization?
		Current hospitalization?
		Received outpatient services in the past?
		Receiving outpatient services prior to admission?
	Programs	Past program participation?
		Current program participation?

Attitude Domain		
Principle Component	**Sub Component**	**Indicators**
Justice	Laws	Negative towards the law?
	Enforcement	Negative towards police?
	Judicial system	Negative towards courts?
	Corrections	Negative towards corrections?
		Negative towards community supervision?
		Negative towards rehabilitation?
Society	Convention	Employment has no value?
		Marital/family relations have no value?

		Interpersonal relations have no value?
		Values substance abuse?
		Basic life skills have no value?
		Personal/emotional stability has no value?
	Elderly	Elderly have no value?
	Women (men)	Women/men roles are unequal?
	Minorities	Ethnically intolerant?
		Intolerant of other religions?
		Intolerant of disables persons?
Property	Personal	Disrespectful of personal belongings?
	Communal	Disrespectful of public property?
	Commercial	Disrespectful of commercial property?
Violence	Domestic	Supportive of domestic violence?
	Instrumental	Supportive of instrumental violence?
Lifestyle	Goal directed	Lacks direction?
	Conforming	Non conforming?