**A Longitudinal Follow-up of Federally Sentenced Women in the Community:
Assessing the Predictive Validity of the Dynamic Characteristics of the
Community Intervention Scale**

by

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Abstract

This study examined the function of dynamic risk assessment in the prediction of female offenders' post-release adjustment in the community. The predictive validity of seven dynamic risk factors from the Community Intervention Scale were assessed with 497 federally sentenced women released into the community. The dynamic risk predictors were assessed four times at 6-month intervals in the community. A within-subjects repeated measure design was performed to determine if *authentic* dynamic characteristics could be attributed to the predictor variables in the study. Cox regression survival analyses with time dependent covariates and Receiver Operator Characteristics were then utilized to determine the ability of the seven needs variables to predict conditional release failure.

Overall, the results were positive and several of the asserted predictions were validated. Six of the seven domains, excluding substance abuse, demonstrated genuine change throughout the study period, and all seven variables were significantly related to outcome measures. The employment and associates variables were empirically deemed the strongest predictors of failure, while the remaining variables displayed moderate to weak predictive relationships with recidivism and revocations. Finally, antisocial associates, attitudes and substance abuse all predicted violent recidivism. Theoretical, practical and statistical implications of this work are discussed.

Acknowledgements

There is always a story behind “the story” and this project is no exception. In June of 1999, we left the Ottawa area to return to the Maritimes with our three young children. For three and a half years, after many failed attempts to get the ball rolling again, this thesis remained “shelved”. In the fall of 2003, as we anticipated the arrival of our sixth child, I attempted the seemingly “impossible mission” of which would have remained true to its name except for an individual who proved herself absolutely invaluable in my struggle across the finish line. She made contact with previously unattainable persons, secured inaccessible resources, and patiently answered a multitude of questions. Her collegial friendship has been of inestimable worth and I remain indebted to Dr. Shelley Brown for the proverbial time and effort she invested in me.

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A Longitudinal Follow-up of
Federally Sentenced Women in the Community:
Dynamic Risk Predictors

Introduction

It is an established fact in the criminological world there is a lower rate of criminal behaviour among females than males (Bertrand, 1969; Hartnagel, 1978; Keeney & Heide, 1994; Rowe, 1986; Young, 1980). Historically, there has also been a relative drought in information/literature on women in conflict with the law (Mayfield, Stewart & McNeece, 2001). However, research with female offenders has increased substantially over the past 25 years (Dornfield & Kruttschnitt, 1992; Kaotoka, 2001; Marquart et al, 2001; McAuliffe & Handal, 1984; Roundtree et al, 1980; Shearere et al, 2001; Wrobel et al, 1991). The majority of this qualitative research has had political and socio-biological perspectives of female criminality (Bertrand, 1969; Covington, 1986; Culbertson & Fortune, 1986; Hannum et al, 1978; Widom, 1979). A smaller portion of this growing body of literature has been rooted in a social psychological perspective of crime (Bonta et al, 1992; Coulson et al, 1996; Jurik, 1983; Rasmussen & Levander, 1996). It has been this psychology of criminal conduct that has propelled the *empirical* investigation of women in conflict with the law.

Works on female adjustment to institution life (Condelli, Bradigan & Holanchock, 1997; Keaveny & Zausziewski, 1999; Larson & Nelson, 1984; Negy Woods & Carlson, 1997; Sultan et al, 1984), treatment programs (Flint, 1960; Pollack & Belshaw, 1998; Peters et al, 1997; Russel, 1978; Thompson, 1968; Wright, 1968) and community supervision (Funk, 1999; Gendreau, Goggin & Papanozzi, 1996) have slowly been appearing. As the empirical evidence has mounted in favour of a social psychological perspective of female criminality, so too has the expanse of the investigation. Predictors such as personality (Turnbull, 1997), measures of attitude (Ireland, 1999) and thinking styles (Walters & Elliot, 1999; Walters, Elliot & Miscoil, 1998) have all surfaced as viable indicators for future female criminal behaviour.

Presently, the “cutting edge” of prediction research has been the analysis of the dynamic risk predictor (Andrews & Bonta, 1994; Brown, 2002; Hanson & Harris, 2000; Motiuk, 1998; Quinsey et al, 1998; Zamble & Quinsey, 1997). The dynamic risk predictor, e.g., substance abuse problem, differs from the traditional static risk predictor, e.g., age at first arrest, as it exclusively explores malleable “needs” that if attended to will decrease the chance of future criminal conduct (Andrews & Wormith, 1984). The genesis of dynamic predictors, also called criminogenic needs, has come from the availability of data from repeated assessment techniques in the field and subsequent multi-wave longitudinal research designs in the lab. These sources have afforded researchers the opportunity to examine the *change* in repeated measures of predictor variables as they relate to outcomes such as community adjustment. These dynamic risk

predictors serve not only as indicators for future community adjustment but simultaneously provide tangible targets/goals for effective treatment services. Presently there are several criminogenic needs that have demonstrated consistent predictive validity with male offenders: criminal attitudes, criminal associates, educational issues, employment, substance abuse, family/marital relations, associates/social support, living arrangements and personal/emotional orientations (Dowden, 1998; Gendreau et al, 1992; Simourd & Andrews, 1994). To date there has been a singular notable effort to examine the differential rate of change with dynamic risk factors (Brown, 2002). This study was completed with a male sample.

Literature Review

In order to set the theoretical stage for the exploration of dynamic risk predictors with the female offender population one must appreciate that the body of literature which has “traditionally” surrounded this group has been steeped in qualitative, and at times starkly speculative, “theories” of female criminality. Thus, to chronologically follow this progression, sociological and clinical theories will be perused first, concluding with an outline of a psychological theory of criminal conduct. The psychological approach has borne many practical derivatives, not the least of which has been the risk, need, responsivity principles that are now applied internationally in corrections (Andrews, 1982). The past application of these principles to the female population will then be explored, and the possibility of future work will be outlined. Finally, the next generation of risk prediction will be unearthed and the possibilities with female offenders presented.

Theories of Female Criminality

As theories of crime germinated and tentatively grew with intermittent empirical support prior to the seventies (Cohen, 1955; Hirschi, 1969; Matza, 1969; Merton, 1938; Miller, 1958; Tannenbaum, 1938), it has been the empirically backed socio-psychological theories that have thrived and prevailed (Burgess & Akers, 1966; Sutherland & Cressey, 1970; Sykes & Matza, 1957) as contributors to the assessment and understanding of criminality. Likewise, it has also been the theoretically-backed assessment *instruments* rooted in social psychology that have shown the most promise in the eighties and nineties (Andrews, 1982; Andrews & Wormith, 1984; Loza & Clements, 1991; Shields & Simourd, 1991; Shields & Whitehall, 1994). Unfortunately, what has been substantially ignored, as these theories have empirically established themselves and assessment instruments sprouted, has been their application to the female offender. Males comprise approximately 90% of those persons arrested for violent crimes and closer to 98% of incarcerated individuals in the country. Hence, the aforementioned statistics appear to justify the relatively infrequent investigation of the female offender.

Theory is particularly important when examining the issue of dynamic predictors or any objective risk/needs assessment for that matter, as atheoretical approaches have provided limited factors and insight to be considered and are often static in nature (Bonta, 1997). Atheoretical approaches have simply “globbed” together variables that have little relationship among them but show predictive potency with outcome measures, e.g., recidivism. Conversely, theory

driven instruments grow as theories expand to encapsulate more factors and often envelop changeable characteristics. Thus, the interchange between theory and fieldwork could provide a symbiotic “soil” for theories of female criminality to grow as empirical information “pours” in its support.

There have been three traditional approaches in the theoretical realm of criminal behaviour (Patterson, 1995). All three have contributed to the knowledge base of female criminality; however, differing statistical/predictive value from each theory has been noted (Wilson & Herrnstein, 1985). The three main theoretical camps are the sociological, clinical and psychological models of criminality. Theories on female criminality have rested primarily in the former two theoretical arenas (Covington, 1986; Datesman et al, 1975; D’Orbean & Dalton, 1980; Morash & Rucker, 1989; Robin, 1969). Only “recent” research efforts have been based in social psychology (Bonta, LaPrairie, & Wallace-Capretta, 1991; Canter, 1982; Coulson et al, 1996, Rankin & Kern, 1994). It is noteworthy that in the following review of theory and related research, the sociological and clinical research have bore limited fruit in terms of predicting and explaining future behaviour of female offenders.

Clinical theories have typically emphasized the biological, emotional and intellectual problems of the offender as ways of explaining the genesis and propagation of antisocial behaviours. Conversely, the sociological theories have diagnosed crime as having a socio-political foundation containing poverty, political oppression and processing/interference by “the system”. As one peruses the literature it becomes evident that these two theories became

intertwined as the “biological inferiority” of the female gave way to limited opportunities in the economic world. Thus it may be most profitable and cohesive to examine the progression of theory and research together as they evolved in their historical context.

Clinical/Sociological Theories

No review of female criminality would be complete or even begins without referencing Lombroso’s (1920) work The Female Offender, where he describes female criminality as an inherent biological tendency towards delinquency. In short, criminality was viewed as a physical ailment as one would consider “short-sightedness”. He attributed women’s *lower* crime rate to their natural tendencies of “piety, maternity, want of passion, weakness and underdeveloped intelligence”. He considered the female offender an anomaly that was deficient in the aforementioned characteristics that typically would serve to “protect” the woman from a life of crime. As well as lacking these “nice” appropriate attributes, Lombroso noted the female offenders exhibited “strong passions and intensely erotic tendencies” as well as high intelligence and physical strength. “Rehabilitation” would simply involve sterilization programs to prevent further “breeding” of such criminal types.

Bonger (1916) shared Lombroso’s views with an emphasis on the “economic stature” of women. According to Bonger women committed fewer crimes because they had less “strength and courage” than men. They were not involved in sexual crimes because they were physically unable to perpetrate them and the role of the woman in sexual life is rather passive than active. Thus

their social position in a capitalist state and their biology explained the lower crime rate. Already one can note the preoccupation of theorists with explaining the crime rate *differential* between men and women rather than the actual etymology of female criminality.

Thomas (1907; 1923) extended the theory of female criminality from physiological musings towards a more psychological model. Firmly rooted in biological differences between the sexes and emphasizing crime in white middle class America, he hypothesized that little female crime existed because women were socialized to “behave well” and guard their chastity for future “investments”. Poor women were not *driven* to crime; but rather they *longed* for it. Thus the female population was primarily comprised of poor women, motivated by the desire for excitement and forgetting the repressive urge of security. Thomas further suggested that women were not rebelling against womanhood but merely acting it out illegally. Thus it was not sexual desire that motivated delinquency but rather the manipulation of male desires for sex to achieve their own ulterior ends – the myth of the manipulative women – the explanation of criminal behaviour.

Freud (1933) fully embraced and magnified this embroilment of female sexuality and criminality. Freudian theory was based on assumptions, regarding universal psychological traits of women, e.g., reproductive instincts, which would invariably produce certain psychological reactions. Criminal activity by women was viewed as a perversion or rebelling against their natural feminine roles, a failure to develop healthy feminine attitudes in an attempt to be a man. Thus, her

sexuality, and perversion thereof, only reinforced and reflected the economic position of women as reproductive and domestic workers. Rehabilitation efforts emphasized the return or adjustment to her “sex role”. Later writers supported Freud’s introduction of sexuality as a pivotal point in female criminality even though there was little mounting empirical evidence (Davis 1961; Pollack, 1950, Konopka, 1966; Vedder & Somerville, 1970).

Pollack (1950) moved away from the theories emphasizing biology/physiology - resting his case on the “inherently manipulative nature of women”. He attempted to explain a differential rate of offending between the sexes by firstly rejecting any possibility of an actual discrepancy. According to Pollack, offences committed primarily by women were simply underreported, e.g., perjury. Further, Pollack suggested that women were well trained in the necessary deceptiveness for crime in their social roles as mother and wife. In these roles, women were well practiced in feigning arousal for husbands as well as hiding menstruation and sexual information from their children. Given her abilities to conceal her emotion and desires allowed her to successfully commit crimes in stealth. Secondly, the male attitude of protectiveness created situations in which males performed crimes at the instigation of the woman. Finally, he concluded, the law dealt more leniently with women than with men, e.g., lighter sentences.

Hence, began the era of “role theories” of female criminal behaviour of which there have been several permutations. *Role reversals* have accounted for female crime as a product of the *masculinization* of female behaviour as women

seek to be like men. Crime was thought to be the natural outcome from females being more masculine physically, socially and psychologically (Adler, 1975). A second variation was *role convergence* which held that there is a simultaneous masculinization of females while there is a feminization of male roles as definitions and expectations in family, school and class culture became increasingly similar for males and female (Adler, 1977). Finally, the third variation, as stated earlier by Pollack (1950), was based on *role validation*. Essentially it was a sexism theory that purported female criminality as an illegitimate expression of femininity rather than a symbol of masculinity.

Davis' (1961) theory and "classic" research focusing on prostitution echoed many of Thomas' sentiments maintaining that the deviant woman was merely adjusting to her feminine role in an illegitimate fashion, rather than rebelling or attempting to be men as Lombroso and Freud suggested. Davis concluded there will always be a class of women who will be prostitutes and a class of men who will "use" them due to the sexual repression inherent in a "well functioning" society. Thus the root of the crime is not based in economic hardship but rather the marital restraints on sexuality.

Konopka (1966) continued the sexism tradition, citing the necessity to study girls' present *influence* on boys in gang fights and their future influences mothering the next generation of men. This was somewhat reminiscent of Pollack's work, continuing with the notion of women as instigators of men and influencers of children. Konopka considered women to be driven to delinquent acts out of loneliness and dependence. Thus rehabilitative "programs" suggested

the females should be guided and equipped as future wives and mothers by providing opportunities to be “pretty sociable women”.

Four years later, Vedder and Somerville (1970) presented delinquency models in similar veins as Thomas and Konopka, viewing female criminality as an extension of femininity in an illegitimate fashion rather than actually rebelling against it. Thus, crime for the female was due to blocked access or maladjustment to the normal feminine role. In support of these notions, “research results” concluded that high rates of crime among black girls was due to their lack of “healthy” feminine role models and lack of sexual opportunities. Ultimately delinquent acts were considered outlets for sexual frustration.

At this point, clinical concepts such as self-esteem/concept/image began to emerge in the female offender literature. These constructs have since had an enduring if not empirically grounded presence in the arena of female criminality. A leader in this movement was Bertrand (1969) as she formulated that behaviour depends largely on the “image” because it shapes our identity – in the case of female offenders, it would be a criminal identity. Significant others shape the emerging “self” combined with the individual’s experiences. The person assumes the attitudes of other individuals toward herself within a social environment creating self-images. Thus the self-image is a social structure arising in social experience. Essentially one comes to know oneself by taking the attitude of someone who knew who you were long before you did. Therefore criminal women have been objectified by their significant others and by society as a whole. Their self-image will tend to be that of things/toys/objects to be used

or misused at will, and consequently experience their criminal actions more as compulsions than do men. Unconvincing research has followed in Bertrand's theoretical footsteps on self-esteem (Covington, 1986; Widom, 1979) and self-concept (Culbertson & Fortune, 1986; Hannum, Borgen & Andereson, 1978).

Also in the clinical camp at this time, were investigators searching for the intelligence quotient-crime link where small statistical relationships were detected and aided little in the search for a theoretical foothold in female delinquency (Felice & Offord, 1972; Ganzer & Sarason, 1973; Hahn, 1980).

Meanwhile, the sociological researchers continued to examine the socio-economic status-crime link. In 1969, Robin explored the hypothesis that participation in an anti-poverty program would reduce delinquency in a sample of 100 female New York City youths. Youths that had applied to the program but were not accepted were employed as a control group. The results indicated there was no evidence that 1) working in the program made enrollees with a previous offence record less likely to re-offend, 2) in any way had a positive effect on particular types of offenders or 3) reduced the overall number of police contacts or specific kinds of offensive behaviour. Conversely, Jurik (1983) examined the impact of economic incentives on female recidivism by implementing and evaluating the Transitional Aid Research Project (TARP) - an unemployment compensation. Jurik found similar trends for males and females with TARP payments and legal employment serving to reduce the number of economic related arrests. Thus, poverty-crime links have remained in the

limelight but have been found lacking in consistent empirical evidence (Teilmann et al, 1983).

Finally, the *liberation theories* of female criminality presented a variation of the general social control theory of crime that integrated the apparent changes in women's position in her "straight world " and her criminal activity (Weis, 1976). It asserted that apparent increases in the prevalence and variety of criminal behaviour among women were a consequence of their "liberation" during the post-war years. The more the position of women in society approximated the position of men, the more alike they become in their conforming and criminal behaviour. A concomitant of this view was a new image of the female offender – a more versatile and serious offender who was equally adept at committing property crimes and acts of violence.

Smart (1979) questioned the liberation theories of female criminality asking what changes, if any, were occurring in the criminal behaviour of women/girls and secondly, what relationship existed between socio-economic/political changes in their status and a participation in crime. Results indicated there had been steady increases in reported female criminal behaviour since the 1930's, well before emancipation and therefore not as new a phenomenon as thought. More objective crime statistics as well as reporting percentages were contributing to a misrepresentation of increased female involvement in crime (e.g., female crime rising 250% in absolute terms meant 4 women to 14). Finally, the relationship between higher societal placement and crime was unfounded as better opportunities outside the home were not

unequivocally the case, e.g., the majority of women were engaged in menial/low status work.

Finally, in response to liberation theorists, Simpson (1989) outlined a feminist criminological perspective that heavily relied on both an economic class perspective of Marxist/socialist feminism as well as the “opportunity” perspectives of the liberal feminists. While Marxists emphasized the *oppression* of women due to class, race, or gender the liberal feminists accentuated gender *inequality* emerging from traditional expectations concerning appropriate roles of men and women in society. These attitudes are then reinforced by discrimination against women in education, work place, and politics. Both of these perspectives are reminiscent of the role theories and social class-crime research previously reviewed which were exposed as empirically disappointing and weak in explaining the evolution of female criminality.

A more sophisticated feminist theory began to evolve during the late eighties that focused on the inherent wrongs of a society driven for and directed by men, and the ensuing oppression and abuse of women that occurred (Doherty, 1998). Feminist theory argues that female criminality is predominantly rooted in childhood victimization that eventually causes delinquent acts by the victim, e.g., running away, promiscuity and drug abuse. In order to survive, the abused girls are “driven” to the streets to support themselves and their habits. During their quest for survival these young women are “criminalized “ by the system as they fend for themselves in the wake of abuse inflicted by men (Chesney-Lind, 1994).

Tangents of feminist theory also suggest that men are ultimately responsible for the criminalization of women as they force or coerce partners into profitable crimes, e.g., prostitution, selling drugs. When accounting for the “violent female offender” these theorists argue that these women have been “pushed” to violence having experienced plenty themselves in their formative impressionable years while simultaneously experiencing an apathetic non-response from the system.

Doherty (1998) posited a Power-Belief theory that explained how even non-abused girls from “good homes” are at risk for delinquency. The two essential components of this theory are a “matrix” of beliefs about themselves and their power, within the patriarchal system they find themselves in. For instance, beliefs can develop that their only legitimate avenue for asserting power is through counter- patriarchal actions, thereby driving these girls into a criminal lifestyle.

Thus, feminist theory has generated little empirical research to substantiate their assertions, at best citing correlational relationships between childhood abuse and criminality. However, where feminist perspectives may eventually prove most useful may be in recognizing the necessity of understanding a woman’s experience of crime/incarceration and her subsequent needs, and incorporating her contribution/feedback into rehabilitative efforts.

Meanwhile, various “clinicians” were “taking one last kick at the can” focusing their efforts down primitive biological avenues. Essentially it was the derivatives of “Lombroso and colleagues” work on female criminality that were

resurrected and published during the seventies and eighties. Chromosomal determinations (Cowie, Cowie & Slater, 1968; Rowe, 1986), an inability to adjust to feminine roles (Fernald, 1986; Vedder & Somerville, 1970), psychiatric/ familial disorders and impaired physical health (Cowie et al, 1968) were all investigated. Other variables such as “sexual corruption” (Erickson and Murray, 1989), physical attributes of “bigness” (Cowie, Cowie & Slater, 1968) and of course the premenstrual/menstrual syndromes and the violence prone woman (Dabbs, 1988; Ellis, 1991; Ellis & Austin, 1971) were examined as potential cases or correlates of female criminality. Conclusive relationships between the aforementioned variables and female offenders were not unearthed. For instance, Harry and Balcer (1987) reviewed all existing studies that pertained to the relationship between menstrual cycles and crime, concluding there was *no* evidence to link any phases of menstrual cycle or fluctuation in hormones with criminal behaviour.

After 50 years of “research”, sociological and clinical researchers had come to few, if any, conclusions regarding the genesis, maintenance or resolution of females “caught” in a criminal world; leaving, at best, a legacy of unsubstantiated speculations and limited empirically validated variables that could predict or point the way to effective interventions for delinquent women in need of help.

Psychological Perspective

Although the exploration of offenders, both male and female, has historically been fixated in mainstream sociological/criminological paradigms of

criminality the tide has turned as the result of a concerted effort of a committed and focused group of researchers that have been rooted in a psychology of criminal conduct (Andrews & Bonta, 1995; Andrews & Wormith, 1984; Bonta, 1997; Brown, 1998; Gendreau et al, 1992; Motiuk & Porporino, 1989) In the past 25 years, researchers such as the aforementioned have delivered unequivocal empirical evidence that has swayed the direction of the field towards a psychology of criminal conduct. Their rational work has propelled forward, and currently dominates, the fields of crime, crime prevention and corrections with male offenders. Their female counterparts' results, however, have been sluggish to follow suit.

The majority of psychological perspectives of crime lean on the premise that criminal behaviour, like any other behaviour, is learned and there are factors that contribute to the likelihood of the acquisition of that behaviour/lifestyle (Akers & Cochrane, 1985; Sutherland, 1947). This model of criminal behaviour encompasses *variables* from other theoretical perspectives, for example, lack of achievement, socio-economic status, psychological stress and antisocial personality. However, it attributes the *majority* of explanatory power to the company kept by potential offenders, their style and content of their thinking and their past behaviour (Ajzen & Fishbein, 1980; Sykes & Matza, 1957); coupled with an antisocial personality that is impulsive, callous, self-centred, seeks thrills and gratification at any cost (Hare, 1991). Ultimately, there is recognition that the *individual* is capable of asserting their free will within the broader context of a depressed social and economic environment. Hence, factors found to be

influential in predicting crime for males were proposed to also be influential in criminal conduct among females (Wilson & Herrenstein, 1985; Glueck & Glueck 1930; 1934).

Some of the earliest work in the field that recognized the individual as a key component, and not just a victim of their circumstance was completed by Sykes and Matza (1957) who targeted the cognitive dimensions of the offender. They suggested that everyone is bound to strive towards values held by society. One becomes "free" to engage in delinquent acts through the use of techniques of neutralization. These techniques allowed individuals to neutralize and temporarily suspend their commitment to societal norms. Sykes & Matza noted five forms of neutralizations called denial of responsibility, denial of injury, denial of victim, condemnation of the condemners and appeal to higher loyalties. These internal attitudes/verbalizations, e.g., rationalizations for law breaking, ruled when and where it was acceptable to engage in criminal activity. These "verbalizations" were not restricted to "explaining away responsibility" after the offence but could also be causal in nature, e.g., articulated before a delinquent act.

Differential association theory (Sutherland & Cressey, 1970) was also a forerunner in the psychological theories of crime, presenting a comprehensive theory exercising social learning principles. The crux of this theory was that all behaviour was learned in a social environment, and it did not matter if that behaviour was "good" or "bad". The major difference between law-abiding citizens and criminals was what they learned but not how they learned it. When

criminal behaviour is learned, the learning includes firstly the techniques of committing the crime, e.g., how to pick a lock. Secondly, the criminal learns the specific direction of motives, drives, rationalizations and attitudes. These attitudes are acquired through relationships with antisocial companions and then culminate in antisocial behaviour. This theory does not emphasize whom your associates are but rather the definitions that are provided by these companions. Criminals are formed when a person holds more pro-criminal definitions than anti-criminal ones. This theory hinges on earlier stated tenets that behaviour is a partial derivative of cognitions and criminal behaviour is learned (Adams, 1973; Akers, 1973; Burgess & Akers, 1966; Cressey, 1954).

Andrews & Bonta (1994) expounded on these earlier works while developing their own working models in their presentation of the Personal, Interpersonal and Community Reinforcement Perspective (PICR) on the Psychology of Criminal Conduct. It is an integrated theory that incorporates several perspectives of criminal conduct including social learning (Adams, 1973; Akers, 1973; Bandura & Walters, 1973;) differential association theories (Burgess & Akers, 1966; Cressey, 1954) and behavioural nuances. It hinges on the operationalization of behaviours and their punishment and reinforcement at several levels. Interpersonal, community and personal antecedents are paired with reward and cost consequences (positive and negative in nature) capable of forecasting future behaviour. Due to past formative experiences and learned thinking styles and skills sets create "expectancies" of certain outcomes for specific behaviours. If the benefits of antisocial behaviours outweigh the "higher road" that could be taken in

any given scenario then the individual will engage in the antisocial action.

Depending on criminal associates, antisocial attitudes, early family experiences, school/employment performances, temperament and ability the offender may or may not engage in antisocial behaviours. Central to this theory are the attitudes and cognitions that “rationalize” the behaviour (Sykes & Matza, 1957) and the associates that model and support the behaviours (Sutherland & Cressey, 1970). The theory also recognizes past and present political milieus, and relevant cultural and social factors that have historically influenced the position of persons in society which inherently have affected the flow of educational, fiscal and social resources.

Risk/Needs/Responsivity Principles

A successful derivative of the psychological perspective of criminality has been the application of the risk, needs and responsivity principles that have been developed and implemented to assess, classify, manage, and treat offenders in an optimally effective and humane way (Andrews, 1982).

Firstly, the risk principle asserts that offenders can be classified according to the presence or absence of designated characteristics of the individual, e.g., age at first conviction. Low, medium and high levels of risk can then be assigned, in the context of a full psychological assessment, depending on the number of characteristics an individual contains.

Relevant variables that would be considered major and minor risk factors have been identified by Andrews & Bonta (1998). Major risk factors would be 1) antisocial attitudes, values, beliefs and cognitive emotional states, 2) antisocial associates 3) anti-social personality factors such as psychopathy, impulsivity,

egocentrism, poor problem solving skills 4) history of anti-social behaviour 5) familial factors, e.g., poor parental supervision, discipline practices, neglect, abuse and 6) low educational, vocational and financial achievement. Minor risk factors would include 1) lower class origins and 2) personal distress, e.g., anxiety, depression. Simply, the more risk factors one has the more at risk for antisocial behaviour they are considered.

The “risk principle” states that lower risk cases, once classified, can be safely diverted to the least restrictive condition (Bonta & Motiuk, 1987) and higher levels of service should be allocated to the higher risk cases. Andrews & Kiessling (1980) determined that intensive supervision services delivered to low risk offenders on probation had the opposite desired effect of reducing recidivism, where rates increased from 10% to 17%! Conversely, high-risk probationers’ recidivism rate dropped from 58% to 31% when intensive services were delivered. Thus, not only was it advisable to divert lower risk cases away from intensive services but necessary to avoid increasing chances of recidivism.

The second “need principle” asserts that if correctional treatment services were to improve community/institutional adjustment measures then criminogenic needs have to be targeted. For instance, if recidivism is the result of antisocial attitudes, don’t deliver a program to increase self-esteem (Andrews, 1989). At present there is a host of research with male offenders supporting the effectiveness of targeting criminogenic needs and the lack of success when “other” needs, e.g., physical health are catered to (Andrews et al, 1980; Andrews & Kiessling, 1980; Andrews et al, 1990; Dowden, 1998). Criminogenic needs are

fluid in nature and directly influence future adjustment of the offender; hence they are often referred to as dynamic risk predictors.

Finally the third “responsivity principle” pertains to the delivery of effective treatment services ensuring the modality is appropriate for the client. With offenders, behavioural-based programs with cognitive-behavioural and social learning influences work best (Andrews et al, 1990; Dowden, 1998). With characteristics of modeling, reinforcement, graduated practices, role-playing, providing of resources and concrete verbal suggestions/direction are hallmarks of successful programs (Andrews & Kiessling, 1980).

While empirical support abounds for risk/needs principle (Andrews et al, 1986) with male offenders, only minimal progress has been made with their female counterparts (Bonta, Pang & Wallace-Capretta, 1990; Bonta, LaPrarie & Wallace-Capretta, 1991; Blanchette, 1996; Blanchette & Motiuk, 1995; Coulson et al, 1996). In *theory* the female offender can be “explained” from emergence to maturity in this social psychological paradigm. However, relatively little empirical attention embedded in a psychology of criminal conduct has been initiated or completed with the female offender population.

Risk Prediction: Female Offenders

What follows is an overview of work that details the progression of risk prediction with female offenders. The studies are few; the results are substantial.

The investigation for factors that could explain or predict female offenders behaviours has been on the books for years. Although it was not embedded in the same theoretical framework or terminology as “risk principles”, substantial

progress was still being made in quantitative strides towards “risk prediction” for female offenders. For instance in 1946, Tolman attempted to examine the validity of psychological recommendations concerning probation for 305 female offenders. The study identified past criminal record, intelligence level, alcoholic “tendencies” and emotional instability as “important” in the adjustment of the females in the community. In 1965, Devault found success on parole was associated with release plans focusing on the family. Parolees with favourable plans were more likely to avoid revocation than those without, as 40% of the successes were maintaining relationships with children or husbands. Revoked females typically had fewer ties with husbands or children and unstable work - two examples of what are now identified as typical criminogenic needs.

One of the first documented accounts of an objective risk assessment for female offenders was Bedford’s (1974) attempt to extend the Parole Prediction Scoring System (PPSS) used for men, to predict the probability of reconviction within two years of being paroled, to the female population. Estimating reconviction based on base rate information the PPSS displayed promising prediction of females on parole. Bedford found a relationship between granting parole and marital status/involvement with children (n=126). The proportion of female offenders granted parole increased from 30% for single women, 36% for divorced, 40% for separated, 55% for married women and 59% widowed. Parole grants also increased as the number of dependant children increased.

It was not until the 1980’s that work with “risk” prediction for female offenders began in earnest. Roundtree (1980) and colleagues conducted a

retrospective study examining 216 female inmates' records for prison misconduct. Results indicated the characteristics, behaviour and experiences of the female criminals before incarceration did affect their prison behaviour ($p < .05$). All the risk factors cited were static in nature. Age at time of offence, employment prior to incarceration, education obtained, and family dysfunction prior to incarceration were all related to outcome measures. These were all similar risk factors found to be pertinent predictors of male offender's future behaviour (Andrews et al, 1990; Dowden, 1998; Wilson & Herrenstein, 1985).

In 1988, Alexander found similar variables such as age and length of sentence predicting adjustment in the first 6 months of incarceration. Predictors such as family ties and marital status also showed a strong relationship to disciplinary adjustment ($p < .05$). Alexander introduced the concept of "isolated personal violence" as a predictor of adjustment. Isolated personal violence referred to the type of index offence, e.g., crime of passion, as an act of violence stemming from relationships, thereby suggesting the female offender may not be a significant danger to the community at large.

In 1989, Canfield reported on a sample of 87 federally sentenced women who were tracked two years after their release into the community. Factors related to recidivism were age at first conviction, prior success on day parole, and employment status ($p < .05$).

The first attempt to examine recidivism of *federally sentenced women* in Canada was published in 1993 (Belcourt, Nouwens, & Lefebvre, 1993), where 968 offenders were followed up 5 years after their release. An overall recidivism

rate of 22% was recorded with almost two thirds of the sample being readmitted within 2 years of release. Another 14% were readmitted more than 5 years after release. More than half of the readmissions were for technical violation of release condition. Female offenders who were native, younger, on mandatory supervision or had committed robbery or manslaughter were over-represented in the readmission group. Conversely, those who were non-native, older, on full parole and had committed drug-related offence were underrepresented.

The previous year, Bonta, Lipsinksi and Martin (1992) reported comparable recidivism figures for a follow-up of 81 released female offenders. Approximately one third committed an offence within three years of release. Again recidivists were younger at the time of their first adult conviction, were on mandatory supervision, and had more than one conviction of an indictable offence

Finally, Simourd and Andrews (1991) delivered a succinct objective review of the female delinquency literature. Sixty studies were identified that sampled both male and female youths, genders were examined on the same risk factors and data was reported separately. Four hundred sixty-four correlations were generated and resulted in the identification of risk factors statistically pertinent to both genders. For female youths the most important risk factors were antisocial peers or attitudes ($r=.39$), temperament or misconduct problems ($r=.35$), educational difficulties ($r=.24$), poor parent-child relations ($r=.20$), minor personality variables ($r=.18$), personal distress ($r=.10$), family structure/parental problems ($r=.07$), lower social class ($r=.07$). Promising but rarely reported risk factors were lack of attachment to convention ($r=.22$) and promiscuous sexual

behaviour ($r=.35$). As one can see in the preceding list those factors resting in sociological and clinical theories were not strongly related to delinquency; personal distress, family structure, lower social class. Similar findings were noted for male delinquents. There were no statically significant differences between the genders. Risk factors for males were applicable for females.

Thus the majority of research that has borne empirically strong results with female offenders has been based in this gender-inclusive psychological perspective of criminality and its derivative principles. The literature has firmly established the consistent ability to predict the female offenders' corrections experience from violent behaviour (Blanchette, 1996) delinquent beginnings/careers (Canter, 1982; Funk, 1999; Ilacqua et al, 1999; Jung, & Rawana, 1999; Kataoka, 2001; Myers et al, 2000), prison adjustment and interventions (Coulson et al, 1996; Eamon et al, 2001; Koons et al, 1997) to community supervision (Blanchette & Motiuk, 1996; Bonta et al, 1991; Megargee et al, 1999; Harm & Phillips, 2001; Lambert & Madden, 1999; Martin et al, 1978; Tollet & Benda, 1999). This sampling of research with female offenders firstly, exemplifies the support for theories based in a psychological perspective of female criminality, as well as exposing the similarities, e.g., risk predictors, female offenders have *shared* with their male counterparts.

Effective objective risk/needs assessments have been the natural derivatives of the psychology of criminal conduct theory. Assessments fulfill mandates for appropriate security placement, treatment and risk prediction; all essential ingredients for effective corrections. However, throughout this quest for

female risk prediction reservations have been expressed (Chesney-Lind, 1989; Shaw, 1991). The practice of “borrowing” assessment instruments developed “for men by men” has been only permissible with cautions exuded to ensure that qualitative research is not excluded and assessments go beyond exclusively criminogenic needs (Burke & Adams, 1991; McLean, 1996). Typical complaints of classification systems have been buttressed by the fact there is more knowledge about male offenders therefore calling into question “expert/clinical” opinions or subjective ratings required in the assessment procedure. These issues have then been compounded by the fact that many assessment tools are often not normalized for the female population, as well as weighing heavily on the severity of the current admitting offence, thereby over classifying female offenders. (Federally Sentenced Women Program, 1994). Concerns have also been voiced regarding the fact that the utility of objective risk assessment instruments diminishes when low base rates are characteristic of the study because the statistic used to analyze the data are typically dependent on base rates (Stevens, 1992). As has been cited earlier – female recidivism rates are low thereby often qualifying for the “low base rate” issue. The issue becomes compounded when the issue of violent recidivism is introduced, as it can be a very infrequent occurrence for female samples.

To conclude – there have been difficulties in predicting risk with females – lower base rates, debates centring on the “genderized” concept of risk and its inapplicability to women (Hannah-Moffat, 1999) contentions that women are being over-classified (Bloom-Covington, 2000; Shaw & Hannah-Moffat, 2000)

while others finding results that suggest females were classified at consistently lower levels than their male counterparts (Coulson et al, 1996; Hann & Harman, 1988; Motiuk 1997). Amid these valid concerns and at times direct opposition by flagrant deconstructionists, the empirical evidence has continued to mount favouring the utility of a variety of static and dynamic risk measures with female offenders.

Objective Risk Assessment Instruments

Only a smattering of researchers has utilized objective risk assessment instruments with females (Coulson, 1993; Coulson et al, 1996; Blanchette & Motiuk, 1996; Bonta et al, 1991; Rettinger, 1998). Three of these instruments incorporate dynamic risk predictors in their repertoire. The first of these is the Level of Service Inventory – Revised (LSI-R) (Andrews & Bonta, 1995) which is an objective risk evaluation instrument based on social learning theory, and has been the most empirically-promising and investigated assessment instrument for female offenders, with norms established for both male and female offenders. It has consistently been proven as reliable and valid in multiple domains of outcome measures with male samples, however it has a limited track record with females, due mostly to the limited research completed. To date it has demonstrated utility and strong positive relationships with predicting recidivism ($r=.51$), parole success ($r=.53$) and half-way house adjustment ($r=.45$) with a sample of provincially sentenced women ($n=526$) (Coulson, 1993; Coulson et al, 1996). These authors “catered” to the gender issue by designating new cut-off scores creating 5 new categories of risk, as females were consistently scoring

lower on the LSI. These 5 categories were then collapsed into a dichotomous high or low rating with a cut-off score of 12.....again the results were robust citing significant differences ($p < .001$) between LSI scores and recidivism.

Rettinger (1998) also found a strong relationship between female offenders' LSI scores and re-offending ($r = .58$, $p < .001$) and concluded that the LSI was "able to adequately predict risk of re-offending for female offenders."

Another scale, the Case Management Strategies (CMS), was developed for probation officers' decisions on case appropriate interventions has been used with the female population. The CMS hinges on a standardized 71-item interview that elicits attitudes toward offence, background and present plans. It also provides the parole officer with impressions and behavioural observations of the offender. In an attempt to assess the prediction capabilities of the CMS and extend the validity of the risk principle with federally sentenced women Blanchette and Motiuk (1995) created composite risk scores from CMS information for 81 FSW. Results indicated 11 items (9 of which were dynamic risk predictors) significantly distinguished between groups on general recidivists. Secondly, 7 items (4 of which were dynamic) were found to significantly differentiate violent recidivists from non-recidivists. A stepwise multiple regression revealed three predictors accounted for significant proportions of variance (48%); time spent on probation, expectations about incarceration and client's major problem area for general recidivism. With respect to violent recidivism, attempted suicide, expectations about incarceration and client's associates accounted for 45% of the explained variance. Finally, the study

demonstrated the ability to predict recidivism for FSW using objective risk assessments.

Meanwhile the Statistical Information on Recidivism (SIR) scale was being applied to female samples. The SIR scale (Nuffield, 1982) is an objective risk assessment instrument that was developed by using a weighted Burgess method with fifteen variables (e.g., age at admission) and provides a score in a range from -24 to +19 providing 5 categories of risk ranging from very good risk to poor risk. Due to its atheoretical foundations the SIR is stacked with static variables with few dynamic factors. Research with the SIR in the female offender population has provided vague and somewhat limited results. For instance, when Bonta, Pang and Wallace-Capretta (1995) studied federally sentenced women on parole they found most women were classified as low risk (SIR) and exhibited a mild association with recidivism. Not all the risk factors for men statistically demonstrated the same relationship with women (Blanchette, 1996). Hann and Harmon (1989) also examined risk prediction using the SIR for female inmates, however, their small sample size precluded any definitive conclusions.

Lastly, the Community Intervention Scale is an empirically validated and theoretically based assessment instrument (formerly the Community Risk/Needs Management Scale, Motiuk & Porporino, 1989; Motiuk, 1996) that provides a comprehensive evaluation of the FSW as she leaves institution life. Its use with Correctional Service Canada began October 1988 during a pilot study at 12 locations across the country (Motiuk & Porporino, 1989). A sample of 453 male offenders was assessed using the Community Risk/Needs Management Scale.

A 6-month follow-up indicated the CRNS was capable of differentiating the nature and level of needs of the offenders. Secondly, these case needs were consistently related to outcome measures, e.g., suspension, revocations. Finally, low risk/low need offenders were not only the largest group but also responsible for significantly fewer revocations/suspensions.

The CIS had its first performance review with females in 1997 (Motiuk, 1997). At that time there were 12 dynamic risk predictors, or criminogenic needs academic/vocational skills, employment pattern, financial management, marital/family relationship, companions/significant others, living arrangements, behavioural/emotional stability, alcohol usage, drug usage, mental ability, health and attitude. An overall rating was generated for the offender on each target domain based on a four-point continuum. The scale ranged from 'asset to community adjustment' to 'considerable need for improvement.' The two intermediate ratings were 'no need for improvement' and 'some need for improvement'. The four point rating scale was collapsed into two discrete categories indicating the absence or the presence of each of the 7 needs. The two ratings 'asset to community adjustment' and 'no need for improvement' were combined to denote the absence of a specific need. The other ratings of 'some' or 'considerable' need were collapsed to indicate the presence of the need.

In conjunction with this analysis, the individual's criminal history was incorporated into the evaluation. Parole officers used the Statistical Information on Recidivism (SIR) Scale to review the characteristics of the offenders' past criminal activity, such as, age of first conviction, number of past offences, and

violent or non-violent nature of past crimes. The final two factors considered were the National Parole Board's Overall assessment of risk and the officer's own judgment based on a thorough review of the individual's case.

Thus, parole officers began formulating a minimum frequency contact required with the offender released in the community by linking assessment of needs and criminal history on a matrix format (Table 1).

Table 1: Risk x Needs Level and Minimum Frequency of Contact

CRIMINAL HISTORY RISK	CASE NEEDS		
	LOW	MEDIUM	HIGH
LOW	1/month (periodic)	2/month (active)	4/month (intensive)
HIGH	4/month (intensive)	4/month (intensive)	4/month (intensive)

Motiuk found offenders could be easily differentiated by the nature and level of risk and needs they presented, and furthermore they were consistently related with conditional release outcome. For example, lower needs and lower risk cases had markedly more success. Interestingly, gender differences were noted for only two areas. Male offenders were more likely to experience drug problems while in the community while female offenders were more likely to have health problems. However, health variables were not significantly related to failure on conditional release.

In 1994, Motiuk and Brown followed up a sample of 604 federal offenders, of which only 31 were females. Due to the limited sample size and the very small number of women suspended in the 6 months follow up ($n=4$) the predictive validity of the CIS was not substantiated for female offenders.

Eight years later, a sample of federally sentenced women on community supervision ($n=292$) who had been administered the CIS was examined. A linear relationship between phase of release (early, mid, late by 6 month intervals) and need level was established. For example, women in the community less than 6 months had higher needs, than those women in the community 6 to 12 months and those in the community longer than 12 months has the lowest need levels, a finding most likely due to the fact that the higher needs offenders were no longer in the community at the 6 and 12 month intervals (Motiuk & Blanchette, 2001).

The CIS now provides a comprehensive, systematic and on-going assessment of the changing needs of offenders who are under community supervision. Presently, the CIS is administered at release and regular 6-month intervals once the FSW is in the community to monitor changes in her behaviour, attitudes and circumstances. It provides an avenue for parole officers to formulate objective and systematic judgments concerning her needs and risk and examine changes in classifications that are allocated over time.

Thus the CIS has demonstrated preliminary positive results. However, there have been no dynamic predictive studies in which the CIS has been validated with a sample of federally sentenced women. Since its early inception, the CIS has since had its 12 original needs domains collapsed into 7 more

succinct and primary needs areas; associates, attitudes, community functioning, employment, marital/family, personal/emotional, and substance abuse.

Dynamic Risk Predictors

Research is beginning to demonstrate the applicability of these seven dynamic risk factors, or criminogenic needs to female offenders (Andrews & Bonta, 1998; Gendreau et al, 1996; Motiuk, 1997). However there is debate regarding which needs are paramount (Bloom & Covington, 2000; Chesney–Lind, 2000; Koons et al, 1997) and whether they are as important for females as they are for males (Dowden & Andrews, 1999; Simourd & Andrews, 1994). Currently, there is considerable support that many of these dynamic risk predictors, which are contained within the CIS, may be pertinent for the female population (Andrews & Bonta, 1994; Andrews et al, 1990; Gendreau et al, 1996; Losel, 1995)

Education/Employment. The employment/education needs area has provided mixed results. Rettinger (1998), Blanchette & Motiuk (1995) and Simourd and Andrews (1994) have all cited the education/employment component as a strong predictor of both general and violent recidivism. Conversely, Dowden & Andrews (1999) found a non- significant negative correlation with reductions in recidivism – although critics have cited that their samples were “contaminated” with male offenders thereby diluting their results. Results from two other studies also came in with weak or mixed results (Blanchette, 1996; Bonta et al, 1990).

Family/Marriage/Children. Family variables have provided promising (Simourd & Andrews 1994) but inconsistent results (Rettinger, 1998; Bonta et al, 1995). Leischied and colleagues (2000) reported that dysfunctional family processes and family dynamics were significant in the genesis and perpetuation of aggressive behaviours in adolescent girls. Dowden and Andrews (1999) concurred with these results, citing that the largest reductions in re-offending in their study were with those women who had participated in programs treating family issues.

Associates. The criminogenic need antisocial associates has bore strong and consistent results “across the board” in the prediction literature (Andrews & Bonta, 1998; Gendreau et al, 1996) and has hailed consistent results with female samples (Blanchette & Motiuk, 1995; Dowden & Andrews, 1999; Rettinger, 1998).

Attitudes. The dynamic risk predictor attitudes has been considered of paramount importance in the prediction, intervention and perpetuation of criminal behaviour (Andrews, Zinger et al, 1990; Andrews & Bonta, 1998; Dowden & Andrews, 1999, Simourd & Andrews, 1994). Clear linear relationships have been established between female inmate attitudes and their security level (Blanchette, 1997), thinking styles and re-arrest records (Alters, Elliot & Miscoli, 1998) and reconvictions (Rettinger, 1998).

Substance Abuse. Although the prevalence of substance abuse among female offenders has been cited as high as 40% (Finn et al, 1999) to 80% (Lightfoot & Lambert, 1992) the predictive validity of it as a risk factor has not

been substantiated. There is, however, ample evidence suggesting substance abuse may be a valid criminogenic need among the female population (Dowden & Blanchette, 1998; Rettinger, 1998). However, Bonta and colleagues (1995) as well as, Loucks and Zamble both failed to find a relationship with alcohol or drug abuse and reoffending for women.

Community Functioning. This need is comprised of evaluations of the accommodations, finances, support, appearance/self-presentation, and leisure activities. A meta-analysis by Gates, Dowden & Brown (1998) found moderate empirical support for this variable as a predictor of recidivism for female offenders. Rettinger (1998) echoed similar findings with “accommodation” and “financial” subcomponents producing strong predictions of recidivism. Blanchette (1996) also found that financial problems at the time of admittance were indicative of returning to custody.

Personal/Emotional. Personal variables have been included during investigations of cognitive aspects, e.g., problem solving, behavioural problems, assertion, mental abilities and health. Andrews et al (1986) coded for 10 different subcomponents for this variable during the development of the LSI and found 80% of them confirmed a significant relationship with recidivism. Measures of psychopathy, neuroticism, socialization, sensation seeking, self control, anxiety, alienation and inadequacy-immaturity were all found significant at $p < .05$. Not surprisingly, it was measures of self-esteem and empathy that were found lacking predictive validity. Conversely, Gendreau et al, 1996 found no relationship in their meta-analysis with personal distress variables and outcome

measures. Interestingly, the majority of those studies coded were reporting on empathy and self-esteem measures. Blanchette (1996) agreed that assessments of mental disorder/ability and emotional stability were unrelated to several outcomes.

In 1998, Correctional Services Canada did a sweeping review of the dynamic risk predictors contained in their Offender Intake Assessment. All reports came back substantiating the utility of dynamic risk predictors from reported successes in the literature. These same dynamic risk predictors are the need domains contained within the Community Intervention Scale (CIS); employment (Gendreau, 1998), marital/family (Paolucci, Violato & Schofield, 1998), associates/social interactions (Goggin, Gendreau & Gray, 1998), substance abuse (Dowden & Brown, 1998), community functioning (Gates, Dowden, & Brown, 1998), personal/emotional orientation (Robinson, Porporino & Beal, 1998), attitude (Law, 1998). One of the conclusions drawn from that project was the call for more research and better research including female offenders (Brown, 1998).

The Dynamic Risk Predictor Continuum

During the pursuit of empirically validating and theoretically developing the concept of dynamic risk prediction researchers have begun to differentiate risk predictors according to their 1) rate of change, 2) origin of change (e.g., internal or external events), 3) determination (intentional vs. natural fluctuations) and 4) predictability of change within the factor. In short, their “changeability” characteristics. Thus, there now exists a continuum ranging from fixed “dead”

predictor variables to rapidly changing, externally driven volatile predictors that are changing unpredictably. The latter of these two types has been referred to as the acute dynamic risk predictor (Hanson & Harris, 2000) or a precipitating labile event (Zamble & Quinsey, 1997). In between these two extremes, there rests the slow-changing-but-relatively-stable risk predictors such as personality traits (open to the possibility of change but unlikely to do so without enormous concerted efforts) and secondly, criminogenic needs. Criminogenic needs can be characterized as slow changing but “open” to the possibility of changing more quickly if direct effective interventions are directly applied to specific factors. The present study will focus on criminogenic needs.

Summary

To summarize, the clinical and sociological theories have offered little empirical support for their causal insights or predictive power regarding females' criminal behaviour. Conversely, the psychology of criminal conduct has shown profitable explanatory power, provided a practical paradigm for correctional workers and has displayed consistent, albeit relatively few, predictions of female offenders' future behaviours (Belcourt, Nouwens, & Lefebvre, 1993; Blanchette & Motiuk, 1995; Bonta, Lipsinksi and Martin, 1992; Bonta, Pang & Wallace-Capretta, 1990). Significant evidence was uncovered that suggests objective risk/needs assessments are reliable and valid for female offenders, thereby warranting further investigation (Coulson, 1993; Coulson et al, 1995; Rettinger, 1998; Simourd & Andrews, 1991). Risk, needs and responsivity principles were reviewed while exploring the dynamic aspect of criminogenic needs and their

utility in the community experience of female offenders. Preliminary work completed with the Community Intervention Scale was reviewed. This scale will be the assessment vehicle for exploring the dynamic nature and predictive validity of female offenders' criminogenic needs.

Present Study

Thus, the present study will focus on the differential rates of change in criminogenic needs that federally sentenced women in the community experience and their relationship to future adjustment. Its emphasis will be on the practical utility of these dynamic risk predictors with female offenders in the community. The study will be theoretically anchored in a psychology of criminal conduct (Andrews & Bonta, 1998).

In her 2002 thesis work on dynamic risk predictors, Brown presented an excellent (and obviously comprehensive) review of the common limitations in this relatively fledgling work of criminological dynamic risk predictors. The author succinctly bemoans the statistical pitfalls of ill-designed studies involving small sample sizes, retrospective and pre/post designs using single method assessment tools and a consistent inconsistency in the choice of analyses. What she presented in her study was the "gold standard" for analyses of dynamic risk predictors. This study will attempt to replicate that standard.

The present project will be unique, as all but one of these aforementioned design limitations, the usage of a single assessment tool, will be addressed. It will be a large (n=457) prospective, longitudinal multi-wave research design of federally sentenced women in the community. Seven theoretically grounded

variables, e.g., substance abuse, family/marital relations, employment, associates/social support, substance abuse, community functioning, personal/emotional orientation and attitudinal indicators from the CIS will be examined. Their fluid relationship with community adjustment will be examined.

Statistical Analyses

Thus, three general areas of analysis will be addressed; firstly the natural and differential rate of change within/among these seven variables will be explored to uncover pertinent dynamisms of the FSW in the community; secondly, the question concerning whether the *reassessment* of dynamic risk predictors while the FSW is in the community will improve the predictive accuracy over and above an initial assessment of the FSW at the time of her release and finally comparisons of the relative predictive power of these criminogenic needs will be established. The results will be presented in the order the analyses were completed.

One of the most advanced statistical analyses in the field, Cox regression survival analysis with time-dependent covariates will be used to accomplish this goal. This procedure has several advantages over the traditional survival analysis that only estimates when, how long, and how often a given event (recidivism) will occur within a given time frame. Cox regression survival analysis with time-dependent covariates is capable of “coping” with variables that fluctuate over time by using the information closest to the failure, thereby eliminating the overly common problem of “losing” subjects before re-assessment. Consequently, FSW who recidivate before their second assessment will not be

dropped from the analysis/study, as they would be if other statistical means were used to analyze the data, e.g., change scores. A second advantage of using Cox regression survival analysis with time-dependent covariates is its ability to compare the predictive efficacy of initial need measures with subsequent multi-wave data of the same criminogenic need, thereby validating the measured need as being genuinely dynamic.

Predictions

The following predictions were asserted:

- 1) It is predicted that all seven CIS domains will be significantly related to failure and will change in the expected direction. For example, those individuals having “failed” during the course of study will have been “experiencing increasing difficulties” in pertinent domains.
- 2) It is predicted that the re-assessment of criminogenic needs will improve predictive accuracy and explained variance in survival time compared to single initial measurements of the same variables.
- 3) It is expected that education/employment and associates, marital/family needs will be the strongest predictors of recidivism and time to failure (Blanchette & Motiuk, 1995; Dowden & Andrews, 1999; Leisheid et al, 2000; Rettinger, 1998; Simourd & Andrews, 1994. It is expected that this will hold true particularly in early (<6months) community adjustment (Lambert & Madden, 1976; Morris & Wilkinson, 1995; Motiuk, 1996),
- 4) It is predicted that substance abuse, community functioning, personal/emotional and attitude domains will display moderate predictive validity

and time to failure (Blanchette, 1996; Dowden & Blanchette, 1998; Gates, Dowden, & Brown, 1998; Rettinger, 1998).

Method

Overview of Female Offenders

In 1989, the Task Force for Federally Sentenced Women embarked upon a massive project to unearth the profile of women in conflict with the law. They surveyed a large portion of the 200 incarcerated federally sentenced women (n=173) and a smaller number (n=57) of the women on conditional release. The report was released in 1992 painting a picture of the “typical” federally sentenced woman being young, single (76%) with children (65%) and minimally educated, struggling in a low socio-economic status situation. She typically carried a history of both addictions (75%) and abuse (sexual 53% and physical 68%). The majority of women were serving their first federal sentence (87%). Thirty-six percent had no previous record and 50% had never been to prison. The majority of repeat offenders had non-violent histories, e.g., fraud, theft and drug charges. Forty-two percent of the sample was serving time for violent crimes, of which only 5% of the victims of these crimes were strangers. These findings highlighted several of the unique issues surrounding the typical female offender, such as familial/acquaintance violence and a lack of criminal history that often coincides with an extensive history of abuse.

Canadian Federally Sentenced Women

In an aggregated statistical sense FSW are less than 2% of the incarcerated population of Canada, and 5% of our violent offenders. Statistics Canada (1996) reported the majority of violent crime (60%) committed by women

involves minor assaults. Only 10% involve more serious assaults, 10% sexual assaults, 12% robbery, and 8% other including .4% murder or manslaughter. In 1981, Wilson documented a substantial increase in violent crimes by females especially in the rates of assault, aggravated assaults and weapons violations. The finding was more pronounced for young girls rather than women.

Loucks and Zamble (1994) provided a “snapshot” of serious female offenders compared to their male counterparts. One hundred women imprisoned at Prison for Women, Kingston participated revealing the following statistics. Proportionately fewer women were Caucasian, were older, and had higher levels of depression and suicide attempts. Women were only half as likely as the men to report moderate alcohol abuse and twice as likely to report at least moderate drug use. Far more men were imprisoned for robbery; more women were imprisoned for non-fatal assaults. Similarities shared were disadvantaged economic backgrounds, early separation from parents, and disruption in education process, emotional maladjustment and substantial criminal records.

Participants

A sample of 725 federally sentenced adult female offenders who were released into the community was extracted on May 1st, 1999, from the Correctional Service of Canada Offender Management System, an automated database. All of the study participants (1) were female offenders who had been admitted to federal custody and received a comprehensive intake assessment to identify risk and needs, (2) had been released into the community by the study extraction date (May 1, 1999) and (3) had available Canadian Police Information

Center records (which documents official offence history), and (4) had a minimum of one Community Intervention Scale assessment during her conditional release period.

Independent Measures

The seven criminogenic need domains from the Community Intervention Scale - associates, attitudes, community functioning, employment, marital/family, personal/emotional, and substance abuse - will serve as the dynamic risk predictors for this investigation.

Dependent Measures

Measures of community adjustment were coded from Canadian Police Information Center (CPIC) files providing *official* recidivism data. Non-violent reconvictions were defined as a conviction for any new general offence, e.g., theft, or fraud. Violent reconvictions were defined as any new conviction for an offence involving crimes against persons, e.g., assault and robbery.

The post-release outcomes were those failures after the *first* release from current conviction(s). The outcomes were divided into three categories: (1) new violent or non-violent offences during the conditional release (2) the conditional release was revoked but no new offence occurred, e.g. technical violation or, finally, (3) the conditional release continued to the extraction date/WED.

Attrition/Pre-Sample Censoring

Before any cases were dropped according to the aforementioned criteria there were several debilitating anomalies noted in the data that had to be addressed. The primary problem involved dates for starting supervision, first

assessments in the community and revocation/recidivism. The dates for these three separate events were not appearing in "order". That is to say, many of the offenders had recidivism dates that preceded their supervision start dates (n=33, 4.5%), or assessment(s) dated before their release date into the community (n=168, 23.2%). A total of 201 (27.7%) cases were affected by this disrupted date pattern. After examining the data, correctional policy/operation standards and practices, it was determined that both of these "problems" reflected an "explainable" phenomenon due to either procedures followed by CSC, the storage of data in OMS or the nature of the data extraction. A total of 201 offenders had at least one of these anomalies, thereby requiring their data profile to be reconstructed. The following section explains the reasons for the apparent anomalies in the data.

Procedural Issues. At present there is a strategic and progressive assessment regime for FSW as they enter, progress and leave the Correctional Service of Canada Institutions.

A component of this assessment procedure is the Community Intervention Scale. It is administered to the offender within 30 days of their re-entry into the community, after which it is administered every 6 months depending on factors such as risk and frequency of contact. To ensure the assessment is completed and available for the offender's placement in the community there is a common practice that has the correctional officer often complete and enter the first assessment of the offender while she is still incarcerated pending release. Thus, assessments that were "completed" and

dated <1 month prior to the offender's supervision start date were used as the offender's first assessment. The date for first assessment was then changed to match the supervision start date. This would give the offender an assessment that was "completed" on her first day in the community (n=145).

For those cases with multiple assessments prior to the release date, the last assessment prior to release was used. The supervision start date was again used as the date of the first assessment (n=23).

Data Storage/Extraction. There were 33 cases that had recidivism dates that preceded their supervision start date. In these cases the download program to extract the data from OMS had not provided a key variable that would differentiate between past sentences served and its related recidivism. It was decided that in these cases the date of first assessment would become the supervisions start date, this would provide very conservative estimates of time at risk as these offenders had obviously been in the community longer than this new date would indicate. A sentence identification variable was then obtained for all cases in this data set and used to check the validity of this assumption. All cases with this problem were confirmed to have had two sentences embedded in their data.

Thus, 201 offenders had their dates for starting supervision or first assessments reconstructed. The four initial criteria were then applied to the data and 67 more cases were dropped. These cases were dropped due to lack of any data in their assessment profiles (n=57), e.g., no values for the dynamic risk predictor variables or they were reported dead (n=10). Forty of these dropped

cases had just been involved in the reconstruction process. Two independent coders completed the reconstruction coding with a 97% agreement rate for all 725 cases. The sample size was now 658, with 161 cases (24%) containing reconstructed date profiles.

Missing Data: Data Storage/Extraction. The next issue screened for in the data was missing data in the CIS assessments, e.g., values for *all* needs at *all* waves of assessments. Many of the offenders had “patchy” assessment histories. For instance, a woman may have her first, third and fourth assessments completed but *no* data for her “second” assessment. This was not a case where one need variable was missing at time 2 or time 4; this was an issue of *all* the need variables missing at one assessment wave. Time between assessments was scanned and it was determined that the time intervals between assessments were so irregular that to move the assessments “up” would not be problematic. For instance, the third assessment was moved into the empty second assessment variables and the third assessment values were then moved into the fourth assessment spot. The corresponding dates of assessments were moved “up” or forward as well.

Implementation of Policy for CIS Reassessments. Although assessments were *supposed* to be completed and recorded at relatively regular time intervals during the offender’s conditional release it was readily apparent that this was not the case for many of the offenders. Attention was then turned towards examining time between assessments to examine what proportions of assessments were completed within the standards set by CSC policy (first assessment within 30

days of release and the remaining assessments approximately every 6 months). Perusal of the data indicated there were multiple cases that had hundreds, in some cases thousands, of days before their *first* assessment was completed. Thus these cases (n=73) had their dates “in order”, that is the supervision start dates preceded the first assessment date, however there was an extended period of time noted between the supervision dates and the first assessment period. In fact what had happened was the FSW had been released into the community well before the policy of reassessments using the CIS was established. Because of this, the pockets of time preceding the initial assessment were nonsensical – simply reflecting women caught in the logistics of implementing a new standard for operations.

It was also noted that assessments appeared to be reported on (not necessarily conducted) in such a sporadic manner that a second assessment for one individual could occur years after someone else’s second assessment

Thus, to accommodate for this irregularity in dates of assessments, the dates of assessments were coded into four discrete categories of Time1 = 0 to 6 months, Time2 = 6 – 12 months, Time3 = 12 – 18 months and Time4 = 18 months to 2 years. If the case did not have an assessment completed within each of these time intervals it was dropped from the sample (unless they had recidivated before the next assessment was due). If there were two assessments completed within the same time interval the latter of the two was retained. The sample size was reduced to 497 cases.

Attrition Analyses

Appendix E details the comparative analysis between those cases dropped and retained. Chi-square analyses and ANOVA revealed that the 228 cases dropped were not significantly different from the cases for which complete assessments were available. Variables examined were; index offence type and severity, prior convictions both number and type, risk levels, and recidivism rates and were not significantly different from the study sample (Appendix E). Age at the time of data extraction was significantly different with the dropped cases being significantly older ($M = 36.8$ ($SD=8.7$) vs. $M = 41.0$ ($SD=10.8$), $p<001$).

Results

Data Screening

All variables were examined for data entry errors and the presence of missing data. In the first wave of assessments 6 variables (1.2%), in the second wave 4 variables (.8%), in the third wave 5 variables (1.0%) and in the fourth wave 2 variables (<.1%) were missing data. All missing data was replaced with the relevant variable mode for each wave of assessments.

All variables were then inspected for univariate outliers, indicators of normality such as skewness and kurtosis, and homoscedasticity. For the seven dynamic risk predictors analysis was completed for all four waves of data, e.g., time1, time2. There was no indication of violations of linearity or homoscedasticity. Three variables had outliers, which were truncated at the ± 3 standard deviations of the mean of the variable. Again, none of the predictor variables displayed skewed or kurtotic characteristic during any wave of the data collection.

An inter-correlation matrix was then generated to screen for multicollinearity (correlations in excess of .80). Variables were examined across all four waves of data collection with no evidence for this phenomenon (Appendix C).

Finally, two multivariate screening techniques were completed. No multivariate outliers were detected, via Mahalanobis Distance. Log minus log

plots were then examined to determine if the ratio of the estimated hazard across time remained constant, a necessary assumption for Cox regression survival analysis. If the lines had crossed on the plot then a violation would be indicated. No violations were detected for the seven dynamic predictor variables.

Sample Demographics

The average age of the sample at the time of the study was 36.8 years ($n=497$, $SD=8.7$) with a range of 20.6 to 68.9 years. Well over half the sample (61%) were single/separated/divorced while 33% were living common-law or were married ($n=497$). The sample ($n=497$) was predominantly Caucasian (57%), with 19% Aboriginal, and the remaining 8% belonging to other minority groups. Offenders were designated as high ($n=126$, 25.4%), medium ($n=115$, 23.1%) and low ($n=256$, 51.5%) risk according to the composite risk assessment contained within the CIS.

Criminal History Information

Prior-offence related information revealed the following trends; the majority of women were charged with property offences such as theft (60.6%) and fraud (39.8%), followed by drug convictions (46.7 %). The most common violent convictions were for weapons 30.6%, arson 20.7% and kidnapping 13.9%, with only the proverbial handful of women in this sample having ever been convicted for assaults (4.8%) or murder (3%).

Table 1

Prior Offence History for Federally Sentenced Women

Offence	Sample (N) (n=497)	Percentage (%) (n=497)
<i>NonViolent Offences</i>		
Theft	301	60.6
Drug	232	46.7
Criminal Negligence	80	16.1
Fraud	198	39.8
Escape	67	13.5
Obstruction	105	21.2
Fail to Appear	232	46.7
Miscellaneous	169	34
<i>Violent Offences</i>		
Arson	103	20.7
Uttering Threats	15	3
Assault	24	4.8
Weapon Charges	152	30.6
Kidnapping	69	13.9
Sex Offence	8	1.6
Manslaughter	3	.6
Attempted Murder	30	6
Second Degree Murder	6	1.2
First Degree Murder	15	3

Note – multiple offences were recorded for individual offenders

Descriptive Recidivism Information

The average time of follow-up of the women in the community was 29 months (SD =16.6) and ranged from 5 days to 6 years. The follow-up time was calculated as the time between the individual's supervision start date until failure or May 1, 1999 when the data was extracted from OMS, whichever date came first. In that time period 20.7% (n=103) of the sample either recidivated (n=94) or were revoked (n=9).

If an offender was coded in OMS for having both been revoked and been reconvicted at the same date the revocation was "dropped" and only her offence was recorded (n = 96, 21%). Hence, this sample appeared to be somewhat unique for female offenders as a relatively small proportion of the failures were "pure" revocations (8.7%). This is contrary to the common finding that female offenders under community supervision are proportionally more likely to be revoked on technical violations rather than a new offence (DeVault, 1965, Norland & Mann, 1984; Spencer & Berocochea, 1972).

Not surprisingly, the majority of reconvicted offenders were non-violent offenders (85.1) (Table2). This sample generally engaged in relatively little violent post-release behaviour (<5%), however, these offences did account for 22% of all reconvictions that occurred.

Table 2

Types of Failure on Release: Revocations, Non-Violent and Violent
Reconvictions

Type of Reoffence	N	% of sample (n=497)	% of reoffenders (n=94)
Revoked	9	1.8	NA
Reconviction - Any Type of Offence	94	18.9	NA
Violent Offence	21*	4.2	22.3
Non Violent Offence	80*	16.1	85.1

* 7 FSW convicted of both non violent and violent offences

NA not applicable

Tabulations of type and number of offences that were committed during release are reported in the next table (3). Crimes such as theft (45.3%) failing to appear (29.5%) and fraud (20%) dominated the convictions. Assault was the most common offence (43%) of all violent crimes committed, followed by weapons (21%) and robbery (21%). Only one woman in this sample was convicted of manslaughter while on conditional release.

Table 3

Reconvictions: Descriptive Information of Offence Type

Type of Offence	N	% of Sample (n=497)	% of Reoffenders (n=94)
<i>Non-Violent Offence</i>			
Theft	43	8.7	45.3
Drugs	9	1.8	9.5
Criminal Negligence	8	1.6	8.4
Fraud	19	3.8	20
Escape	10	2	10.5
Obstruction	9	1.8	9.5
Fail to Appear	28	5.6	29.5
Miscellaneous	14	2.8	14.7
<i>Violent Offence</i>			
Robbery	5	1	5.3
Uttering Threats	2	.4	2.1
Assault	10	2	10.5
Weapons	5	1	5.3
Manslaughter	1	.2	1.1

Timing of Failures

Although there were women who recidivated during all four time periods, the majority of offenders returned to incarceration during the first 6 months. In a somewhat predictable manner, 67 of the 103 failures (65%) occurred before their second assessment (time2). Another 22 (21%) recidivated between their second assessment (time2) and their third assessment (time3), 10 occurred between time3 and time4 and the remaining 4 women failed after their fourth assessment.

Descriptive Information of Dynamic Measures

The mean and standard deviations for the seven dynamic measures from the CIS are offered in Table 4. Interestingly all seven variables followed the same trend with reductions in the severity of the need across time. For instance, employment needs were on average at their highest levels (3.0) at Time 1 and continued to drop to 2.8 at Time2, to 2.7 at Time3 and 2.3 at Time 4. A similar trend was noted for five of the other needs domains. Most of those variables hovered around a central tendency of 2 with the exception of attitudes, which reported consistently lower means of 1.9, 1.7, 1.6 and 1.5 respectively. A more “user-friendly” table displaying the percentage of cases with identified needs was also generated but was relegated to the appendices as it does not contribute to the determination of the dynamic nature of the variables.

Table 4

Descriptive Information of Dynamic Measures at each Wave
(Means and Standard Deviations)

Dynamic Measure	Time 1	Time 2	Time 3	Time4
Employment	3.0 (.73)	2.8 (.73)	2.7 (.70)	2.3 (.76)
Family	2.6 (.94)	2.4 (.89)	2.4 (.84)	2.1 (.82)
Associates	2.5 (.92)	2.2 (.88)	2.1 (.83)	2.0 (.84)
Substance Abuse	2.5 (.78)	2.3 (.58)	2.2 (.48)	2.2 (.45)
Community	2.9 (.74)	2.6 (.72)	2.4 (.69)	2.2 (.64)
Personal/Emotional	2.9 (.70)	2.8 (.66)	2.6 (.69)	2.4 (.58)
Attitudes	1.9 (.65)	1.7 (.63)	1.6 (.68)	1.5 (.66)

Time1 = first assessment completed at 0 to 6 months

Time2 = second assessment completes at 6 to12 months

Time3 = third assessment completed at 12 to 18 months

Time4 = fourth assessment completes at 18 to 24 months

Assessing Change in Dynamic Measures

Although there appeared to be change within the dynamic variables as time passed, as indicated in Table 4, it was impossible to determine from this descriptive data whether the change was due to changing proportions of recidivists and non recidivists or whether the variable was actually reflecting genuine change in the CIS measures. Consequently, a within subject change analysis was conducted using only those cases that did not fail, e.g., recidivate/revocation during their time at risk in the community, to determine whether the change in the variables was “authentic”.

Repeated Measures Analyses

A doubly multivariate repeated measures analysis was conducted on all seven need variables together. This data set was inherently unbalanced due to the loss of subjects at each wave of assessment due to the coding procedures noted in the method section of this paper. Therefore, attrition at each wave of assessments was not just reflecting loss due to recidivism but also subjects being dropped due to variations in storage of assessment information. The Repeated Measures Analyses in the General Linear Models of SPSS drops those cases (offenders) that do not have a “completed” assessment history. Consequently, this portion of the analysis was conducted on only those subjects with four completed assessments (n=64).

When conducting repeated measure designs there are two pivotal assumptions: that the variances are equal and that they are uncorrelated to each other. The Mauchly Test of Sphericity tests for both of these assumptions at the same time. If this assumption were not met the averaged F-test would overestimate the strength of the relationship between the variables. Such was the case with this data. The sphericity assumptions were not met and therefore the multivariate test of significance was examined. When there are no between subject factors, as is the case in this analyses the only assumption for multivariate tests is that the measurements are sampled from a multivariate normal distribution. Therefore, Wilk’s Lambda criterion indicated that this group of dynamic risk predictors was significantly changing over time, $F(7, 64) = 5.31$, $p < .000$).

This analysis was then followed with seven single-group univariate repeated measures analysis (Table 5) to determine which variables were experiencing the most change. Again, sphericity violations were present and consequently Wilk's Lambda was examined to provide an estimate of significance. An authentic dynamic change in the variables continued to be supported by the data, as all need domains exhibited significant amounts of change at time1 through to time 4, except the substance abuse variable.

The Employment and Community measures appeared to be fluctuating the most ($p < .001$), followed closely by assessments of family and personal/emotional variables. Attitude and Associate measures were significant but the "weakest" of all the change variables.

Interestingly, one of the variables (employment) that exhibited the most significant change during this analysis was ultimately one of the strongest predictors of failures in the community as the Cox regression survival analyses with time dependent covariates would demonstrate later. The next (and only other) strongest predictor of survival in the community (as determined by the Cox regression survival analysis with time dependent covariates) was the associates variable. As can be seen in Table 5, this variable displayed "weaker" change characteristics than most of the other variables (personal/emotional and community) that would eventually be determined to be less powerful predictors of failure.

Attention is drawn to these results at this point in the analysis to reiterate the issue that it is not just the pursuit of change in a variable but as will be

demonstrated later in the analysis the pursuit of meaningful change in a timely manner (just before failure) relevant to a specified outcome (recidivism).

Table 5

Repeated Measures Analysis: Within Subjects-Change

Dynamic Measure	Time 1 (n=64)	Time 2 (n=64)	Time 3 (n=64)	Time 4 (n=64)	Significance Levels
	<u>M (SD)</u>	<u>M (SD)</u>	<u>M (SD)</u>	<u>M (SD)</u>	
Employment	3.0 (.76)	2.7 (.75)	2.5 (.69)	2.3 (.72)	***
Family	2.5 (.91)	2.3 (.74)	2.2 (.73)	2.0 (.82)	**
Associates	2.2 (.90)	1.9 (.87)	1.9 (.78)	1.9 (.86)	*
Substance Abuse	2.3 (.60)	2.1 (.44)	2.1 (.42)	2.1 (.44)	n.s.
Community	2.9 (.75)	2.6 (.72)	2.4 (.66)	2.2 (.64)	***
Personal/Emotional	2.7 (.64)	2.7 (.60)	2.6 (.66)	2.4 (.59)	**
Attitudes	1.7 (.56)	1.6 (.49)	1.5 (.61)	1.4 (.66)	*

Time1 = first assessment completed at 0 to 6 months

Time2 = second assessment completes at 6 to12 months

Time3 = third assessment completed at 12 to 18 months

Time4 = fourth assessment completes at 18 to 24 months

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

Pairwise Comparisons

Finally, a series of pair wise comparisons were performed to determine if there were significant changes in each dynamic variable at each assessment wave. Due to the large number of comparisons that would be performed Bonferroni correction procedure was applied to control for Type 1 errors, e.g., rejecting the null hypothesis when it is true.

As would be expected from the last analysis, substance abuse exhibited very weak difference scores (Table 6). Three distinct trends appeared with the other variables. The first trend involved the three variables personal/emotional, attitudes and family assessments. These three dynamic risk predictors only exhibited significant change between the first and fourth assessments. Only after being in the community an extended amount of time (18 to 24 months) were significant changes be detected from the initial assessment. Secondly, the employment and attitude variables exhibited change across all four time periods. Meaning that these variables were in a constant state of flux – although from this analysis it could not be determined if this change was ultimately related to an offender's failure to survive in the community. Finally, the Associates variable only showed significant changes between the first and second assessments. This finding was of particular interest, as associates would later prove to be one of the strongest dynamic risk predictors of survival time in the community. This may then be a preliminary indicator that this particular variable may warrant closer monitoring in the early stages of release.

Table 6

Pairwise Comparisons: Within Subject Change Among Successful Cases on Seven Dynamic Predictor Variables.

Dynamic Measure	Time1	Time1	Time1	Time2	Time2	Time 3
	vs	vs	vs	vs	vs	vs
	Time2	Time3	Time4	Time3	Time4	Time4
<hr/>						
	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>
<hr/>						
Employment	.3*	.5*	.7*	.2*	.5*	-.2*
Family	.2	.3	.4*	.1	.2	-.1
Associates	.3*	.3	.3	.2	-.1	.1
Substance Abuse	.1	.1	.1	.1	0	.1
Community	.3*	.5*	.7*	.2*	.5*	-.2*
Personal/Emotional	.1	.2	.3*	.1	.3*	-.1
Attitudes	.1	.2	.3*	.1	.1	-.1

Time1 = first assessment completed at 0 to 6 months

Time2 = second assessment completes at 6 to12 months

Time3 = third assessment completed at 12 to 18 months

Time4 = fourth assessment completes at 18 to 24 months

D = difference score

*the mean difference is significant at .05 level (adjustment for multiple comparisons: Bonferroni)

Recidivism Prediction

The analyses of recidivism proceeded as follows: all seven dynamic variables were examined at time one (first assessment) for their predictive validity to several outcome measures via correlational analyses. A second wave of correlational analyses was then performed to explore the prospect that looking at the last assessment just before the offender “failed” could enhance prediction. Cox regression survival analyses were then performed to examine the variables’ ability to predict time to failure, with a ROC analyses to assess the relative accuracy of these predictions.

Dynamic Measures at Time1: Binary Outcome

With the dynamic nature of the variables established, the analysis turned to predicting two outcome measures, i.e., general failure and violent re-offences. The first set of correlational analyses demonstrated that the initial assessment of four variables (at time 1) were valuable predictors of the female offenders’ adjustment in the community. The predictive efficiency, and lack thereof of all seven needs variables is illustrated in Table 7.

The associates variable, which would reflect the lack of positive social influences or the presence of antisocial friends was predictive for all four outcome variables, including both violent and non-violent reoffences. Both antisocial attitudes and family factors appeared to be the next strongest predictors demonstrating significant predictive validity for all outcomes except violent offences. Substance abuse was the only other variable to exhibit a significant relationship with outcome (general failure).

Table 7

Correlations Between Time1 Dynamic Measures and Type of Outcome

Initial Dynamic Measure @ Time1	Any Failure	Any Type of Reoffence	Non Violent Offence	Violent Offence
Employment	.06	.05	.06	.00
Family	.11*	.12**	.1*	.01
Associates	.17**	.13**	.12**	.12**
Substance Abuse	.10*	.07	.04	.08
Community	.02	-.01	-.01	.03
Personal/Emotional	.02	.02	.01	.06
Attitudes	.17**	.13**	.09*	.08

*correlation significant at the 0.05 level (2-tailed)

**correlation significant at .01 level (2 tailed)

A parallel correlational analyses was then conducted to examine if the dynamic variables at the time of their first assessment held any significant relationship with the severity of the outcome measure, i.e., not just *if* but *how much* of an offence took place (Table 8). Again, associates and attitudinal assessments demonstrated significant relationships with the outcome variables examined. In fact, the strongest predictor of the severity of a violent offence was

the measure of antisocial associates. The family factor retained its predictive power, but not so for substance abuse as it displayed no relationship with any of the three outcomes. Interestingly, the community functioning variable revived to show a significant relationship between itself and the total number of offence an offender committed while on conditional release.

Table 8

Correlations Between Time1 Dynamic Measures and Severity of Outcome

Dynamic Measures @ Time1	Total Number of Offences	Number of Non-Violent Offences	Number of Violent Offences
Employment	.01	.01	.02
Family	.10*	.10*	.08
Associates	.10*	.09*	.12**
Substance Abuse	-.01	-.01	.08
Community	.09*	.09	.04
Personal/Emotional	.05	.05	.05
Attitudes	.10*	.09*	.11*

*correlation significant at the 0.05 level (2-tailed)

**correlation significant at .01 level (2 tailed)

Dynamic Measures: Last Assessment Prior to Failure

The next set of analyses assessed how well the *re-assessment* of the dynamic measures could enhance predictive accuracy. This strategy is essentially the same adopted by Cox Regression Survival Analysis that uses the assessment immediately prior to an offender's failure. Thus, if the offender fails before their second assessment (time 2) then the first assessment (time 1) would be used, if the offender fails after the third assessment (time3) but before the fourth assessment (time 4) then the information from the third assessment will be utilized, thereby ensuring that the dynamic measure used is the one in closest temporal proximity to the censoring event (Becker, 2000).

As can be seen in Table 9, there was a marked increase in the predictive accuracy attained by all seven dynamic measures relating to the specified outcomes. Variables, which had little predictive accuracy at the time of their first assessment, now exhibited significant relationships with several of the outcome measures. Employment, substance abuse, community functioning and personal/emotional needs, which had yielded no previous association, now displayed significant predictive prowess (Table 9). And those variables that were moderate predictors at the time of the first assessment showed even stronger predictive accuracy, e.g., family and associates. Interestingly, attitudes showed the opposite trend; with stronger predictive validity at the time of their first assessment compared to those measurements at the time of the last assessment before failure.

Not surprisingly, the prediction of violent offences remained limited. What was unanticipated was that substance abuse (which previously presented a weak relationship to failure in prior correlational analysis) was one of only two variables that predicted violent re-offending. The other predictive criminogenic need for violent behaviour was the offender's associates.

Table 9

Correlations Between Dynamic Measures in Closest Temporal Proximity to Failure and Type of Outcome

Dynamic Measure	Any Failure	Any Type of Re-offence	Non Violent Offence	Violent Offence
Employment	.19**	.17**	.18**	.06
Family	.14**	.14**	.13**	.08
Associates	.20**	.18**	.16**	.14**
Substance Abuse	.16**	.13**	.08	.09*
Community	.16**	.14**	.14**	.05
Personal/Emotional	.12**	.12**	.10*	.07
Attitudes	.15**	.10*	.08*	.05

*correlation significant at the 0.05 level (2-tailed)

**correlation significant at .01 level (2 tailed)

In the parallel analysis looking at the relationship between the dynamic measures in closest temporal proximity to the failure and the *severity* of offence the following trends were noted. Family relationships remained relatively constant in its predictive potency while the associates variable strengthened in its predictive relationship with outcome (Table 10). Two variables that showed weak relationships with outcomes measures at the time of first assessments showed significant increases in explanatory power: community functioning and personal/emotional factors. Again, attitudes showed a stronger relationship to outcome at the time of first assessment then immediately prior to failure.

Table 10

Correlations Between Dynamic Measures in Closest Temporal Proximity to
Failure and Severity of Outcome

Dynamic Measure	Total Number of Offences	Number of Non-Violent Offences	Number of Violent Offences
Employment	.08	.08	.06
Family	.11*	.10*	.06
Associates	.13**	.12*	.13**
Substance Abuse	.01	.01	.08
Community	.16**	.16**	.04
Personal/Emotional	.11*	.11*	.06
Attitudes	.09	.08	.06

*correlation significant at the 0.05 level (2-tailed)

**correlation significant at .01 level (2 tailed)

Recidivism Prediction: Continuous Outcome (Time to Failure)

In the next portion of the analysis, Cox regression survival analysis was employed to determine the relationship between the need variables and the amount of time they survived out in the community before re-offending.

Cox Regression Survival Analysis (Time1)

Seven *separate* Cox regression survival analyses were conducted on each of the seven dynamic measures *at time 1* to establish whether they were independently related to survival time.

As Table 11 illustrates, five of the seven variables ($n=497$) significantly predicted time to failure (revocation or recidivism) ($p<.05$), to the exclusion of the personal/emotional and community functioning variables. Upon examination of the -2LogLikelihood Statistic ($-2LL$) the best fit of the survival curve was generated by associates ($p<.000$), followed by attitudes ($p<.000$) and substance abuse ($p<.001$). Employment and family measures provided relatively weak improvements of the fit between the base survival model and the observed data.

Table 11

Cox Regression and ROC Results: Time1

Dynamic Measure	-2Log		Sig.	Hazard Rate	AUC (CI)
	Likelihood (with variable)	λ			
Employment	1192.8	3.8	*	1.3	.54 (.48 - .60)
Family	1190.2	6.5	**	1.3	.57 (.51 - .63)
Associates	1177.8	18.2	***	1.6	.60 (.54 - .66)
Substance Abuse	1186.4	11.2	***	1.4	.56 (.49 - .62)
Community	1196.8	.17	ns	1.0	.51 (.45 - .57)
Personal/Emotional	1195.2	1.7	ns	1.2	.51 (.45 - .57)
Attitudes	1182.4	1.7	***	1.7	.61 (.54 - .66)

* significant at the 0.05 level

**significant at .01 level

***significant at .001 level

-2Log Likelihood (without variable) = 1196.83

Hazard rate = represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

The change in percent of the hazard ratio or the relative risk is another way to examine the impact of the different covariates on survival time. For instance, if one examines the fifth column labelled relative risk in Table 11 an offender with an elevated assessment of employment needs is 1.3 times more

likely to fail within the next assessment period compared to a person without increased employment needs. Likewise, an offender is 1.7 times more likely to recidivate before their next assessment if they are exhibiting antisocial attitudes compared to an individual with a pro-social orientation during her first assessment. Conversely, an offender who is not initially functioning well in the community, e.g., managing finances poorly, is not any more likely (relative risk = 1.0) to fail than someone who appears to be functioning well.

Receiver Operator Characteristics (ROC) Time (1)

When executing Cox Regression Survival Analysis that process will generate X'Beta scores. These scores are essentially the standardized score for each individual predictor variable, or can be thought of as the standardized predicted value one would generate in a linear regression to estimate the best linear combination of the variables. These X'Beta values that are generated during survival analyses can then be saved and serve to generate Area Under the Curve Values in ROC analysis. The Area Under the Curve values indicate the *predictive accuracy* of a predictor, or its "hit rate". In other words, how many times will the predictor variable "get it right" in predicting an event will occur, e.g., recidivism.

Individually these variables did not display strong results. Initial assessments of attitudes yielded the highest AUC (.61) closely followed by the assessments of Antisocial Associations (.60). Family factors (.57) and Substance Abuse (.56) were the next "strongest". Community and Personal/Emotional factors were little better than chance with AUC's of .51.

Cox Regression (Stepwise) Survival Analysis: Multivariate (Time1)

The next phase of the analyses assessed which combination of dynamic risk predictors assessed at time1 made the strongest predictor model. Cox (Stepwise) Regression Survival Analysis was conducted on the five variables that had already demonstrated a significant univariate relationship with survival time in the previous analysis (Table11). Only associates and attitudes entered the equation, as employment, family and substance abuse factors did not add significantly to the predictive power of the set (Table 12).

Again, the X'Beta scores were used to assess the degree of relationship between the subset of this combination of need variables (associates and attitudes) and failure on release.

Table 12

Cox Stepwise Regression and ROC Results: Time1

Dynamic Measure	-2Log			Hazard Rate	AUC (CI)
	Likelihood (with variable)	λ	Sig.		
Step 1 Associates	1177.81	18.2	***	1.64	
Step 2 Associates	1168.39	13.4	***	1.54	.66 (.52 - .71)
Attitudes		10.2		1.57	

***significant at .001 level

-2Log Likelihood (without variable) = 1196.83

Hazard rate = represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

Finally, a parallel Cox regression survival analyses was conducted for all seven dynamic risk predictor variables at Time1 with violent reconvictions as the outcome measure. Results are displayed in Appendix C. The associates variable remained a moderate predictor ($p < .01$) of time to failure, followed by significant but weaker relationships of family, substance abuse and attitude variables ($p < .01$).

Dynamic Measures: Time Dependent (Last Assessment)

The final set of analyses attempted to unearth the best *dynamic* risk predictors, those that improve in their predictive ability over time. In order to do this, seven individual Cox regression survival analyses with time dependent covariates were conducted on each separate need variable. All assessments from Time1 to Time 4 were involved in the analysis. Results were examined to determine which of the seven needs were independently related to survival time in the community.

Cox Regression Survival Analyses with Time Dependent Covariates (Last Assessment Before Failure)

Strong positive relationships were unearthed between all seven variables and the amount of time the offender spent in the community (Table 13).

Table 13

Cox Regression and ROC Results: Time Dependent Dynamic Measures (Using Last Assessment Before Failure)

Dynamic Measure	-2Log				
	Likelihood (with variable)	λ	Sig .	Hazard Rate Exp(B) (CI)	AUC (CI)
Employment	1176.12	20.2	***	1.8 (1.4 – 2.4)	.62(.57 - .68)
Family	1186.04	10.6	***	1.4(1.1 – 1.7)	.60(.54 - .66)
Associates	1171.60	23.9	***	1.8(1.4 – 2.2)	.63(.57 - .69)
Substance Abuse	1178.80	20.3	***	1.7(1.3 – 2.1)	.59(.53 - .65)
Community	1185.39	11.5	***	1.5(1.2 – 1.9)	.61(.55 - .67)
Personal/Emotional	1184.74	12.1	***	1.6(1.2 – 2.1)	.58(.52 - .64)
Attitudes	1188.18	9.5	**	1.5(1.1 – 1.9)	.61(.55 - .67)

**significant at .01 level

***significant at .001 level

-2Log Likelihood (without variable) = 1196.83

Hazard rate = represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

Cox Stepwise Regression Survival Analysis with Time Dependent Covariates

The last analysis in this study attempted to select the best combination of time dependent dynamic variables using Cox Stepwise Regression Survival Analysis. All seven variables were entered as they all demonstrated a significant univariate relationship with survival time in the previous analysis. Only associates and employment entered the model, as the other five variables did not add significantly to the predictive power of the set.

Receiver Operator Characteristics (ROC): Last assessment

X'Beta scores were then used to generate a ROC analyses to assess the predictive accuracy of this model (associates and employment needs). The Area Under the Curve for this model endorsed it as the most accurate prediction model/variable presented in this study (.70).

Table 14

Cox Stepwise Regression and ROC Results: Last Assessment Before Failure

		-2Log			
Dynamic Measure		Likelihood	λ	Sig.	Hazard Rate
		(with variable)			AUC (CI)
Step 1	Associates	1171.59	23.9	***	1.8
Step2	Associates	1161.31	10.1	**	1.6
	Employment				.70 (.64 - .74)

***significant at .001 level

**significant at .01 level

-2Log Likelihood (without variable) = 1196.83

Hazard rate = represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

Again, a parallel Cox regression survival analyses with time dependent covariates was conducted for all seven dynamic risk predictor variables utilizing their last assessment before failure with violent reconvictions as the outcome measure. Again, the associates variable remained a strong ($p < .001$) predictor of survival time, with substance abuse and personal emotional factors also displaying significant relationships with the outcome. Results are displayed in Appendix C.

Summary of Strongest Prediction Models/Variables

The Cox regression survival analysis based on the *initial assessments* in the community (time1) identified associates and attitudes to be the most relevant and potent predictors time to failure in the community. While substance abuse, family and employment measures were also found to be predictive of time to failure they did not significantly add to the prediction model, and thus were not added into the final model.

The Cox regression survival analysis with time dependent covariates based on the offenders' *last assessment* before failure again identified associates as one of the strongest predictors, however, attitudes were no longer as strong a predictor as the employment measures. Although all seven dynamic risk predictors were considered significantly related to survival time, the stepwise regression again generated a two-variable best "fit" model. Thus, the final dynamic model was comprised of only two variables – associates and employment needs.

Discussion

Overview

This study examined the predictive validity of seven dynamic risk factors from the Community Intervention Scale with 497 federally sentenced women released into the community. Four separate assessments in the community, at 6-month intervals, were analyzed for each of the dynamic risk factors. A within-subjects repeated measure design was performed to determine if *authentic* dynamic characteristics could be attributed to the need variables in the study. Cox regression survival analyses with time dependent covariates and Receiver Operator Characteristics were then utilized to determine the ability of the seven needs variables to predict conditional release failure.

Overall, the results were positive and several of the predictions were validated. Six of the seven domains, excluding substance abuse, demonstrated genuine change throughout the study period, and all seven variables were significantly related to outcome measures. The employment and associates variables were empirically deemed the strongest predictors of failure, while the remaining variables displayed moderate to weak predictive relationships with recidivism as was predicted.

Dynamic Trends

It was noteworthy that during the within subjects repeated measures design there were differences detected among the dynamic variables. Some variables were exhibiting stronger change characteristics than others. For instance, employment and community functioning variables exhibited the “most” change. Intuitively, it made sense that employment needs would be high in the initial assessments and community functioning would be relatively low as the offender begins the integration process back into society. What was particularly interesting was that these variables did not stabilize over time, but rather remained in a constant state of flux.

Because employment was found to be one of the strongest predictors of success or failure in the community, these changes in the employment variable may warrant continuous monitoring – future research could focus on determining a critical assessment window (CAW) for employment needs where monitoring would be deemed most effective. This could ultimately replace the concept of “frequency of contact” with perhaps a more individualized schedule for assessment. Given the significant time constraints already pressuring front line correctional staff a more specific assessment regime with fewer but more effectively timed assessments could prove most beneficial.

For instance, if employment needs remain at an elevated level for any period of time during community supervision, especially paired with elevated associate needs, immediate intervention and attention should be directed to these women.

Regardless, greater emphasis on employment programs is an obvious “fall out” from this study. When the offender re-enters community there is a dual pressure to establish herself back in the community as well remain accountable to the justice system she is progressing through. Programming requirements often conflict or impede the possibility of steady employment being secured right away. The results from this study confirm that employment needs are an issue for female offenders on conditional release as well as their male counterparts (Brown, 2002)

Likewise, the changes in the community functioning variables may be deemed as “normal” and simply reflecting the natural fluctuations that come part and parcel with the re-integration process. However, given the significant finding of the Cox regression survival analysis with dependent covariates these fluctuations are obviously related to impending failure. Although its *relative* importance may be less than that of the other “big changing” needs variable employment it remains an important predictor of adjustment.

Another interesting finding with respect to the dynamic nature of these seven need variables was the *lack* of dynamism found with substance abuse needs. This variable was ultimately determined to be a significant predictor ($p < .001$) of failure in the community, however, there was no actual change detected between any of the four waves of assessment. This may be due to the difficulty that many researchers and correctional personnel have lamented that it is nearly impossible to get a direct indication of whether the offender is experiencing difficulties with substance abuse as it is directly related to

conditions of their release, as well as the fact that because it is a condition of release it is being monitored very closely and the offender's are being "intervened" upon before failure occurs.

Another interesting movement of the variables was the change noted in the associates variable – denoted as perhaps the single more important and strongest dynamic risk predictor in this study which displayed significant change only between the initial assessment in the community and the second assessment (Time2). This dynamism may reflect the natural time line, 6 to 12 months, it takes offenders to 1) "get back in touch" with antisocial companions or 2) a reactive digression to familiar but antisocial companions to buffer stress the individual may be experiencing having been now out in the community a significant amount of time or even more likely 3) a reconnection with former domestic partners deemed antisocial by objective standards.

The *timing* of change exhibited by six of the seven need variables may eventually provide indices for an individualized "critical assessment window" (CAW) rather than scheduled assessment intervals. More research is warranted to elaborate on the timing of case specific monitoring practices that could be differentially targeting phase of release, e.g., early or latent or pre/post intervention phases of release.

Predictive Potency of Dynamic Risk Predictors

Similar to Brown's (2002) findings, most of the needs assessments did not gain strong consistent predictive potency until the multi-wave data was examined. Two very general trends appeared in the prediction phase of this study; there were variables that predicted straight across the board (time one to

time four), e.g., associates and attitudes and those that “picked up steam” as the analysis/time progressed, e.g., employment. For instance, during the initial assessment period the employment measure was weakly related to the outcome measures. However, in the final models generated by the Cox stepwise regression survival analysis, employment was firmly established as one of the two strongest predictors of failure in the community. This was naturally due to the fact that employment was a high need for all women as they re-entered society, and it was not discriminating between failure prone and “stable” individuals until further along in their conditional release.

To appreciate the role that each of the need variables played in the prediction of non-violent and violent recidivism in the community. Each of the dynamic risk predictors will receive a “close-up” evaluation of its performance in this study and their results compared to those found in the literature.

Employment. In the repeated measures analyses and pairwise comparison employment was one of two variables that exhibited very strong change across time ($p < .001$) in so far as the measure was experiencing significant amounts of change across *all* assessment periods. This variable showed no correlational relationship to outcome at Time1 and only a moderate relationship with failure at the “last” assessment before failure. However, when the Cox regression survival analysis was performed the employment measure was a significant predictor at both Time1 and Last Assessment runs, and it was even included in the model of strongest dynamic predictors as determined by the Cox stepwise regression survival analysis with time dependent covariates

analysis. These findings were consistent with those cited by Rettinger (1998), Blanchette & Motiuk (1995) and Andrews (1994) who all found employment to be a strong predictor of general recidivism. This study, however, did not support their finding that it was predictive of violent recidivism (Appendix C).

Family. The family needs variable of the CIS generated ($p < .01$) significant change across time in the repeated measures analyses and the pair wise comparisons. This variable presented moderate significant correlations with all types and severity of outcome measures at both initial and last assessment before failure. Although it was not included in either of the “best” predictor sets it performed well in the Cox regression survival analyses displaying significant relationships with survival time for general failure but not violent recidivism. Again, these results are consistent with earlier findings by Simourd & Andrews, 1994, Leisheid et al, 2000 and Dowden & Andrews, 1999.

Substance Abuse. During the repeated measures analyses and pairwise comparison it became apparent that substance abuse was not exhibiting significant change across time. This variable has been traditionally plagued with a serious quantification issue as it has become readily apparent by researchers and correctional staff that to reliably measure “needs” in this domain is problematic as it is often directly related to conditions of release. Thus, this variable was the only variable that did not support the prediction that all assessed needs would display change over time. However, it did support earlier research by Dowden & Blanchette (1998) and Rettinger (1998) that found empirical

support for substance abuse as a valid criminogenic need among the female population.

Despite its dynamic deficit substance abuse exhibited significant correlations with the type of failure, violent vs. non-violent, the offender would exhibit. These predictions were proficient at both the time of entry into the community (time1) and later assessments (last assessment before failure). What was most surprising about this measure was that despite its lack of change it remained one of the four variables that predicted violent re-offending.

Associates. This variable delivered a strong statistical performance, as it was dynamic and predictive (of both general and violent recidivism) and established itself in both prediction models for static prediction at time one and dynamic prediction at the last assessment before failure. It even predicted violent behaviour as well as general recidivism.

In the repeated measures analyses this was one of the weaker change variables present ($p < .05$). This may be due to the fact that it retains the same issues that also surround substance abuse measures, insofar that it is a measure directly related to conditions of release and therefore the offenders have an invested interest to distort the reality of being in touch with antisocial companions or are being revoked upon any indication of increased needs in this area. Therefore, in light of this operational constraint of attaining accurate measurements of this need, the relationships found in this paper could be considered conservative and the results marked considering the logistical problems of attaining a clear evaluation of this construct

It was interesting that the two variables that are explicitly part of the conditional release agreement were both significant predictors of failure in the community, associates and substance abuse. Given the consistent finding of the importance of the associates variable in all phases of this study future research agendas may need to incorporate the pursuit of identifying even more reliable and precise indicators of this elusive predictor in their schemas.

Summarizing, previous research results have claimed this variable to be a strong and consistent predictor of female offenders' failure in the community (Blanchette & Motiuk, 1995; Dowden & Andrews, 1999; Rettinger, 1998). These findings were confirmed.

Community. Like Gates, Dowden & Brown in 1998, this variable produced significant empirical relationships with failure in the community. It also echoed the findings of Rettinger (1998) and Blanchette (1996) that measures of community functioning are pertinent predictors of female offenders future behaviour.

The community predictor variable presented the same dynamic characteristics that the employment variable did during the repeated measures analyses and pairwise comparison with very significant ($p < .001$) change across all four waves of assessments And also like the employment measure the variable demonstrated an inconsistent relationship with outcomes during the correlational analyses. It redeemed itself by posting significant ($p < .001$) results in the Cox regression with time dependent covariates analysis. Although this variable ultimately proved it contains predictive power, it is inherently unstable

due to the multitude of constructs it contains; in short this variable is a bit of a “hodge podge”. Future work would do well to tease out the essential elements that hold the predictive potency of this variable, e.g., financial vs. participation.

Personal/Emotional. This variable exhibited significant change, had no relationship to outcome from first assessments and displayed moderate correlations with outcome from the last available assessment before recidivism. Although there was no relationship detected during the initial assessment, once again the Cox regression survival analyses found this variable demonstrated significant ($p < .001$) predictive power. It did not enter into the final model of the best set of predictors; however, it did demonstrate predictive proficiency at empirically anticipating violent behaviour in the community. Its versatility was demonstrated by the fact that it was dynamic, it was predictive and maintained a relationship with future violent behaviour. With little previous work done on it, the present study's results support the continued use of personal/emotional needs as a predictor variable with female offenders in the community.

Attitudes. Not surprisingly, the attitude needs and their relationship to failure in the community was empirically strong as was predicted based on prior research (Alters, Elliot & Miscoli, 1998; Rettinger, 1998). The assessments of attitudes proved to be a profitable pursuit in this study, as it exhibited significant change during the early phase of the analysis and consistently predicted both non-violent and violent behaviour. Its predictive potency was so significant that it maintained a position in the set of best predictor variables at Time1 (as the female enters that community). What was particularly interesting about this

variable was that it tended to exhibit most of its significant relationships, e.g., with violent recidivism, at Time1. This may hint to the particular importance of its initial assessment as the female offender enters into the community and monitoring attitudes early in her release.

Creation of a Composite Variable

Given the substantial predictive power that all seven need domains displayed (Table 13) at the time of their last assessment before failure, and after reviewing their unique contribution and significant relationship to failure in the community, the results of this study appear to understate their individual importance. That is, while the Cox stepwise regression survival analysis with time depend covariates hails associates and employment as members of the “best “ predictor model one almost forgets that all seven were very significantly related to outcome measures. Thus, in an attempt to drain all available dynamic information future research endeavours could attempt to incorporate all seven needs into a quantitative composite needs score, e.g., sum all scores from individual needs. Thus, an individual that receives ratings of 3 on employment, 2 on family needs, 4 on associates, 3 on substance abuse, 2 on community, 2 on personal /emotional and 4 on attitudes factors would receive a score of 20 out of a possible 26. A preliminary attempt of creating such a composite score is documented in Appendix H. Eventually, appropriate cut off scores or weighting factors could also be generated for such a composite score.

Statistical/Analytical Implications

One of the current issues that has been posited in corrections psychology and the work on dynamic risk predictors has been that of establishing a “gold standard” for analyses of dynamic risk predictors (Brown, 2002). An approach that would consistently entail a progressive three-tiered analysis incorporating 1) a within subject repeated measures design, 2) Cox regression survival analyses with time dependent covariates and a 3) Receiver Operator Characteristics (ROC) analysis. This was completed in this study, thereby cross-validating Brown’s analytical approach on dynamic risk predictors and replicating the usefulness of this algorithm for female samples as well as with male offenders. The most significant feature of this three-tiered statistical approach is the elimination of premature sample censoring due to failure prior to second assessment. This was aptly demonstrated in this study as well over half of the subjects (65%) recidivated before their second assessment. If the commonly used techniques of artificial change variables or hierarchical regressions had been used in this study, over half of this sample would have been lost. Thus, this study confirms the necessity to establish a consensus for appropriately analyzing changes in predictor variables and their relationship to outcome measures.

A peripheral, but noteworthy, point of discussion is to highlight the fact that the findings of this study are based on the data of an entire population rather than the “traditional” sample. The population being defined as all federally sentenced women in Canada that had been released into the community prior to the study date. The subtle but obvious implication of this fact is that the results

presented are at a statistical “advantage” over those findings that would be based on a similar sampling of the population.

Real-World Implications and Applications

There were two primary directives in the “real world” that could be culled from the results of this applied research. Although these two issues are distinct entities, they are also very much intertwined. The first is data collection, storage and retrieval from the Offender Management System. The second is the future direction, or the next step in community corrections’ assimilation of dynamic risk predictors’ information.

Data collection, storage and retrieval. In the method section of this study the documented data manipulation that took place was tedious and time consuming. Extensive time and attention were devoted to securing *relevant* information from the downloaded data from the OMS system. It was apparent that the storage and retrieval of OMS data is in need of review, particularly in light of the leading role dynamic risk prediction is certain to play in both policy and operations within Canadian corrections. Clear mandates surrounding data analysis and retrieval need to direct and drive the data storage and retrieval practices of corrections researchers and operations personnel. As the research begins to accumulate in favour of utilizing multiple wave assessments Canadian researchers can again be world leaders in the data base management techniques required for these advances. A thorough review/knowledge will be required of 1) the statistical analyses required for assessing dynamic risk predictors, 2) policies of CSC surrounding these predictors, as well as 3) *realistic* operational practices to assess and file this information. The results could then

be integrated into the development of a fluid database that would be amenable to on-line object oriented analysis.

For instance once the syntax commands are established for a Cox Regression Survival Analysis with time dependent covariates, a simple window could allow for updated statistical analysis every one, 6 or 12 months as data accumulates. Eventually these updates could be generated at an individual level as assessment information becomes available. Thus, individuated needs assessments based on collected data could then direct participation in interventions and the timing of future assessments. These concepts suggest the second direction this study presents for future research in real world applications.

RPM (Reintegration Process Monitoring) Application

This type of individually tailored assessment regime is the future of dynamic risk assessment. The field needs to now move beyond whether or not these variables predict, to more refined questions of when (timing) do they predict best? In what combinations? In what circumstances? Or when is a variable no longer relevant during community supervision? An ideal vehicle for conceptually and statistically organizing this advancement would be the RPM (Reintegration Process Monitoring) application, a comprehensive “working model” for dynamic risk predictors in community corrections. The results of this study have provided a foundation for such a model. A succinct overview of such a model is presented in Appendix E. The model has been adopted from condition-based monitoring applications in systems engineering disciplines. The model would provide a comprehensive “living” program that would have the

capacity to accept data, analyze it and provide direction for future interventions after “digesting” assessments of dynamic risk predictors, recidivism data and intervention feedback. The first step of implementing such a model was completed in this study: the identification of pertinent dynamic risk predictors that display predictive potency with community adjustment and would be susceptible to planned interventions.

Thus, these results could now be incorporated into a limited portion of the RPM (Reintegration Process Monitoring) application. The identification of the offender’s resources (step1), defining treatment/ intervention requirements (step2) and a primitive “schedule” for the delivery of services (step4) were secured in this study. Steps 1 and 2 would be all seven needs that demonstrated significant relationships with adjustment in the community. Information for step 4 could be derived from the repeated measures and paired comparisons analyses that provided information on patterns of change. More than just recidivism data could also be feeding into the step 5 and step 6, as the hazard rate statistic generated in the Cox regression survival analysis would provide pertinent information on the increased likelihood that the individual would fail in the next assessment period given her past assessment history.

Eventually this completed application could provide a tool to 1) increase sensitivity for targets/timing of interventions with FSW in the community 2) determine appropriate assessment intervals, 3) establish reliable indicators of community adjustment and fourthly provide a concrete medium for program evaluation thereby significantly advancing management practices in community

corrections, by endowing a mechanism to provide more cost effective measures and a vehicle for superior delivery of human services for female offenders.

Theoretical Implications

As was expected, the evaluation of dynamic risk predictors in the Community Intervention Scale has contributed to mounting evidence for a theoretical orientation of female criminality based in social psychology. These seven variables have all been derived for their outstanding role in social learning, differential association and psychology of criminal conduct theories. For instance, these theories would assert the negative influence of antisocial companions, or the attitudes that these companions helped develop and maintain, was evident in the recidivism rates of those women that had reported high needs in these areas.

Limitations

The most glaring restriction on the generalizability of these findings may arguably rest with the constitution of the data set itself. However, the utmost care was taken to ensure each changed date reflected an informed, conservative and as unobtrusive a change as possible. The 97% agreement between coders for this portion of the project bolstered confidence that the data was handled in a systematic, replicable and reasonable manner. If only “pristine cases”, e.g., no missing data, all dates in the proper order, all first assessments within the first 30 days, and remaining assessments every 6 months, had been retained it was estimated that approximately 150 offenders (21% of the 725 cases extracted from OMS) would have been retained. Ultimately, a judgment call was made that

it would be ethically irresponsible not to make every reasonable effort to incorporate *every* assessment that was available given the time and money that had already been invested in attaining these measures, that field data cannot be expected to appear as faultless as laboratory data, and that the incomparable potential of completed repeated assessments on federally sentenced women in the community was of paramount interest to correctional personnel and researchers alike.

Another limitation of this data reflects an operational practice that makes a distinction between those CIS assessments that exhibit change from the previous assessment and those assessments that remain relatively stable. Conventionally, only those assessments that reflect a change from the previous assessment are entered into the OMS database. If there is no change being exhibited by the individual then the assessment hard copy is placed on file. This practice would account for full waves of data that were missing and consequently “moved up”. The missing assessments in all likelihood had been completed but upon examination revealed no change from the previous assessment and thus were not entered into the database. (Given this information an even more conservative form of reconstruction could have entailed copying the full assessment directly prior to the missing wave of data.). Thus, this practice of filing assessments that do not exhibit change would have led to an overestimation in the dynamic characteristics examined during the repeated measures and paired comparison analysis. However, the Cox regression

survival analysis with time dependent covariates results should theoretically remain unscathed by this practice.

And finally, the results from this study remain to be cross validated with a sample of federally sentenced women released into the community in order to secure the assertions and conclusions put forth from these results.

Conclusions

The present study has contributed to the steady progression in both theory and application of the “dynamic risk predictor”. This study has contributed evidence revealing criminogenic needs as an integral component for reducing propensities for poor community and institutional adjustment (Andrews & Bonta, 1994).

Despite the suggestion that risk assessment instruments developed primarily for male offenders may not be applicable for female offenders (Shaw, 1991) the results of this study demonstrate the CIS to be a relevant and valuable tool for the assessment of female offenders in the community. All seven variables were predictive of future behaviour. Four of these variables were capable of significantly anticipating violent behaviour.

Ultimately this study’s most significant contribution to the field of corrections was that it directly addressed the “debatable” issue whether and which dynamic risk predictors are relevant for the female offender and addressed the contentious issue that the “genesis of” and “interventions for” female criminality is completely different from their male counterparts. Obviously, this study does not exclude the empirically validated contribution that other variables

may eventually contribute to the understanding of female criminality. However, it does provide pragmatic power to the notion that there are dynamic risk predictors for community adjustment that are relevant for both men and women. Echoing Brown's (2002) sentiments, "priority should be given to securing employment and maintaining steady employment as well as building (healthy) support networks". The results of the present study are all the more compelling as one ponders the fact that Brown's statement was in her closing reflections of her seminal work on dynamic risk predictors for a sample of federally sentenced *men*.

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Appendix A – Community Intervention Scale

Case Need Area			
Academic/Vocational Skills	No Current Difficulties	Level of skills causing minor interference	Level of skill causing serious interference
Employment Pattern	No Current Difficulties	Employment situation causing minor adjustment problems	Employment situation causing serious adjustment problems
Financial Management	No Current Difficulties	Situational or minor difficulties	Severe difficulties
Marital/Family Relationship	No Current Difficulties	Occasional instability in relationships	Very unstable pattern of relationships
Companions/Significant Others	No Current Difficulties	Some criminal and/or negative associates	Mostly criminal and/or negative associations
Accommodation	No Current Difficulties	Occasional changes in residence, or temporarily situated	Frequent changes in residence, or no permanent address
Behavioural/Emotional Stability	No Current Difficulties	Behavioural/emotional problems that indicate some need for assistance	Severe behavioural/emotional problem indicate sig. Need for assistance
Alcohol Usage	No Current Difficulties	Some alcohol usage causing moderate adjustment problems	Frequent or uncontrolled usage, causing serious adjustment problems
Drug Usage	No Current Difficulties	Some drug usage causing moderate interference	Frequent or uncontrolled usage, causing serious adjustment problems
Mental Ability	No Current Difficulties	Deficiencies limit but do not prohibit independent functioning	Deficiencies severely limit independent functioning
Health	No Current Difficulties	Physical handicap or illness that interferes with functioning	Serious physical handicap or illness that severely interferes with functioning
Attitude	No Current Difficulties	Recognizes problem areas but not receptive to assistance	Unable to recognize problem areas and not receptive to assistance
Special Needs	Sex Offender	Mentally Disordered	Other
Case Needs Rating	Low	Medium	High
Criminal History Risk Rating	Low	Medium/High	

Appendix B

Coding Guide for Community Adjustment Outcomes

FPS: _____

Supervision start date (yy/ mm/ dd): ____/ ____/ ____

Term # _____ Evaluation # _____

Official Criminal History Record:

*Enter the number of offences (i.e. convictions) for each individual crime. If there are none, enter 0. This section is to be coded exclusively from the official records contained in CPIC files, and includes only charges and convictions **prior to the current release** (i.e., prior to the supervision start date for the current term).*

Nonviolent Offences

1. ____ Theft, break & enter, possession of housebreaking tools, possession of stolen property, theft of telecommunications, disguise with intent, forcible entry, unlawfully in a dwelling house.
2. ____ Drug offences (i.e., possession and trafficking).
3. ____ Criminal negligence (includes serious driving offences such as impaired or dangerous driving, failure to stop at the scene of an accident, hit- and run).
4. ____ Fraud, forgery, false pretenses, impersonation, uttering, possession of stolen credit card.
5. ____ Escape, unlawfully at large, prison breach.
6. ____ Obstruction of justice, perjury, contempt of court, resist arrest, give contrary evidence.
7. ____ Fail to appear in court, fail to comply with recognizance, fail to comply with probation order, breach of probation, breach of recognizance.
8. ____ Miscellaneous offences: vandalism, causing a disturbance, mischief, willful damage, trespassing, conspiracy to commit a non-violent offence, vagrancy, prostitution, minor driving offences (e.g., driving while license suspended), public intoxication.
9. ____/ ____/ ____ Date of first non-violent conviction (yy/mm/dd)

Violent Offences

10. ___ Robbery, armed robbery, robbery with violence, extortion.
11. ___ Arson, firesetting.
12. ___ Uttering threats, participation in riot, intimidation.
13. ___ Assault, assault causing bodily harm, wounding with intent, malicious wounding.
14. ___ Possession of a weapon, possession of explosives, pointing a firearm.
15. ___ Kidnapping, abduction, forcible confinement, forcible seizure.
16. ___ Violent sex offences (e.g., sexual assault)
17. ___ Manslaughter.
18. ___ Attempted murder, conspiracy to commit murder.
19. ___ Second degree murder.
20. ___ First degree murder.
21. ___/___/___ Date of first violent conviction (yy/mm/dd)

Dispositions in offender's criminal history

*Check all that apply. This section is to be coded exclusively from the official records contained in CPIC files, and includes only convictions **prior to** the supervision start date listed above.*

22. ___ Fine
23. ___ Suspended sentence
24. ___ Community service work
25. ___ Probation
26. ___ Provincial term of incarceration
27. ___ Federal term of incarceration
28. ___ Other (specify) _____

Post-Release Outcome:

- A) Outcome of *first* release from current conviction(s)-
(i.e., **after** supervision start date listed above):
- a) Conditional release revoked: new violent offence
 - b) Conditional release revoked: new non-violent offence
 - c) Conditional release revoked: no new offence
 - d) New violent offence after WED
 - e) New non-violent offence after WED
 - f) Conditional release continued to date/ WED
- B) Date of (first) revocation/new conviction (yy/mm/dd): ____/____/____
- C) If the offender has re-offended, indicate which offences apply:

Official Reconvictions:

*Enter the number of offences (i.e. convictions) for each individual crime. If there are none, enter 0. This section is to be coded exclusively from the official records contained in CPIC files, and includes only charges and convictions **after** the current release (i.e., after the supervision start date for the current term).*

Nonviolent Offences

1. ____ Theft, break & enter, possession of housebreaking tools, possession of stolen property, theft of telecommunications, disguise with intent, forcible entry, unlawfully in a dwelling house.
2. ____ Drug offences (i.e., possession and trafficking).
3. ____ Criminal negligence (includes serious driving offences such as impaired or dangerous driving, failure to stop at the scene of an accident, hit- and run).
4. ____ Fraud, forgery, false pretenses, impersonation, uttering, possession of stolen credit card.
5. ____ Escape, unlawfully at large, prison breach.
6. ____ Obstruction of justice, perjury, contempt of court, resist arrest, give contrary evidence.
7. ____ Fail to appear in court, fail to comply with recognizance, fail to comply with probation order, breach of probation, breach of recognizance.
8. ____ Miscellaneous offences: vandalism, causing a disturbance, mischief, willful damage, trespassing, conspiracy to commit a non-violent offence, vagrancy, prostitution, minor driving offences (e.g., driving while license suspended), public intoxication.

9. ____/____/____ Date of first non-violent recidivism conviction (yy/mm/dd)

Violent Offences

10. ____ Robbery, armed robbery, robbery with violence, extortion.

11. ____ Arson, firesetting.

12. ____ Uttering threats, participation in riot, intimidation.

13. ____ Assault, assault causing bodily harm, wounding with intent, malicious wounding.

14. ____ Possession of a weapon, possession of explosives, pointing a firearm.

15. ____ Kidnapping, abduction, forcible confinement, forcible seizure.

16. ____ Violent sex offences (e.g., sexual assault)

17. ____ Manslaughter.

18. ____ Attempted murder, conspiracy to commit murder.

19. ____ Second degree murder.

20. ____ First degree murder.

21. ____/____/____ Date of first violent recidivism conviction (yy/mm/dd)

Appendix C
Parallel Analyses for Violent Recidivism

Cox Regression and ROC Results for Violent Recidivism: Time1

-2Log					
Dynamic Measure	Likelihood (with variable)	λ	Sig.	Relative Risk	AUC (CI)
Employment	242.49	.16	Ns	1.1	.51(.46 - .55)
Family	238.34	4.1	*	1.6	.53(.49 - .57)
Associates	232.33	9.2	**	2.3	.66(.55 - .76)
Substance Abuse	237.63	5.4	*	1.8	.54(.49 - .59)
Community	242.35	.30	ns	1.2	.51(.46-.58)
Personal/Emotional	239.82	2.8	ns	1.7	.52(.47 – 56)
Attitudes	239.19	3.9	*	1.8	.54(.48 - .61)

* significant at the 0.05 level

**significant at .01 level

-2Log Likelihood (without variable) = 242.65

Hazard rate represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

Cox Stepwise Regression and ROC Results for Violent Recidivism: Time1

Dynamic Measure	-2Log				
	Likelihood (with variable)	λ	Sig.	Relative Risk	AUC (CI)
Step 1 Associates	232.33	9.2	**	2.3	.66(.55 - .76)

***significant at .001 level

-2Log Likelihood (without variable) = 242.65

Hazard rate represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

Cox Regression and ROC Results for Violent Recidivism: Last Assessment
before Failure

Dynamic Measure	-2Log				
	Likelihood (with variable)	λ	Sig.	Relative Risk	AUC (CI)
Employment	239.92	2.7	ns	1.6	.51 (.47 - .56)
Family	238.91	3.6	ns	1.6	.52(.46 - .57)
Associates	229.87	11.3	***	2.5	.69(.58 - .78)
Substance Abuse	236.49	7.0	**	2.0	.57(.54 - .65)
Community	241.40	1.3	ns	1.4	.53(.50 - .61)
Personal/Emotional	238.24	4.4	*	1.9	.57(.49 - .63)
Attitudes	241.56	1.2	ns	1.4	.53(.47 - .56)

* significant at the 0.05 level

**significant at .01 level

-2Log Likelihood (without variable) = 242.65

Hazard rate represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

Cox Stepwise Regression and ROC Results for Violent Recidivism: Last
Assessment before Failure

Dynamic Measure	-2Log				
	Likelihood (with variable)	λ	Sig.	Relative Risk	AUC (CI)
Step 1 Associates	229.86	11.3	***	2.5	.69(.58 - .78)

***significant at .001 level

-2Log Likelihood (without variable) = 242.65

Hazard rate represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

Appendix D
Inter-correlation Matrix: Multicollinearity Analyses

Predictor Variables Assessed at Time1: Inter-correlation Matrix

Var.	1	2	3	4	5	6	7
1	-						
2	.25	-					
3	.31	.30	-				
4	.27	.33	.42	-			
5	.41	.26	.20	.22	-		
6	.23	.39	.24	.34	.25	-	
7	.14	.18	.18	.18	.14	.22	-

1 Employment
2 Family
3 Associates
4 Substance Abuse
5 Community
6 Personal/Emotional
7 Attitudes

Predictor Variables Assessed at Time2: Inter-correlation Matrix

Var.	1	2	3	4	5	6	7
1	-						
2	.23	-					
3	.29	.28	-				
4	.23	.30	.31	-			
5	.34	.23	.21	.21	-		
6	.19	.37	.18	.33	.23	-	
7	.30	.12	.18	.13	.13	.14	-

1 Employment
2 Family
3 Associates
4 Substance Abuse
5 Community
6 Personal/Emotional
7 Attitudes

Predictor Variables Assessed at Time3: Inter-correlation Matrix

Var.	1	2	3	4	5	6	7
1	-						
2	.37	-					
3	.16	.37	-				
4	.22	.23	.30	-			
5	.44	.21	.04	.27	-		
6	.37	.35	.12	.33	.32	-	
7	.18	.16	.01	.23	.09	.16	-

- 1 Employment
- 2 Family
- 3 Associates
- 4 Substance Abuse
- 5 Community
- 6 Personal/Emotional
- 7 Attitudes

Predictor Variables Assessed at Time4: Inter-correlation Matrix

Var.	1	2	3	4	5	6	7
1	-						
2	.22	-					
3	.04	.04	-				
4	.26	.37	.25	-			
5	.40	.26	.02	.04	-		
6	.41	.37	.21	.49	.07	-	
7	.29	.19	.02	.02	.29	.04	-

- 1 Employment
- 2 Family
- 3 Associates
- 4 Substance Abuse
- 5 Community
- 6 Personal/Emotional
- 7 Attitudes

Appendix E

Analyses of Offenders Dropped from Primary Data Set Extracted from the Offender Management System

Prior Offence History for Federally Sentenced Offenders Dropped from the Analyses

Offence	Sample (N) (n=228)	Percentage (%) (n=)
<i>NonViolent Offences</i>		
Theft	113	49.6
Drug	97	42.5
Criminal Negligence	31	13.6
Fraud	72	31.6
Escape	22	9.6
Obstruction	37	16.2
Fail to Appear	76	33.3
Miscellaneous	67	29.4
<i>Violent Offences</i>		
Arson	42	18.4
Uttering Threats	6	2.6
Assault	5	2.2
Weapon Charges	56	24.6
Kidnapping	23	10.1
Sex Offence	4	1.7
Manslaughter	4	1.7
Attempted Murder	28	12.3
Second Degree Murder	6	2.6
First Degree Murder	26	11.4

Types of Failure on Release: Revocations, Non-Violent and Violent

Reconvictions of Offenders dropped from the Analyses

Type of Reoffence	N	% of sample (n=228)	% of recidivists (n=57)
Revoked	2	.1	
Recidivated - Any Type of Offence	55	24.1	Na
Violent Offence	14	6.0	24.6
Non Violent Offence	46	20.1	81.7

* 10 FSW charged with both non-violent and violent offences

NA not applicable

Recidivism: Descriptive Information of Offence Type of Offenders dropped from the Analyses

Type of Offence	N	% of Sample (n=228)	% of Recidivists (n=57)
<i>Non-Violent Offence</i>			
Theft	27	11.8	47.3
Drugs	7	3.0	12.2
Criminal Negligence	7	3.0	12.2
Fraud	13	5.7	22.8
Escape	4	1.7	7.1
Obstruction	9	3.9	6.8
Fail to Appear	15	6.6	6.5
Miscellaneous	9	3.9	3.9
<i>Violent Offence</i>			
Robbery	3	1.3	1.3
Uttering Threats	1	.4	1.7
Assault	12	5.2	21.0
Weapons	2	.8	3.5
Second Degree Murder	1	.4	1.7

Appendix F

Reintegration Potential Monitoring (RPM) Application

A Working Model with Dynamic Risk Predictors

As the search for more effective risk predictors and management techniques continues in the world of criminal psychology the “cutting edge” of research in the world of mechanical engineering is not so far away. Micro-processor based systems for monitoring and analyzing the condition of equipment holds pertinent principles that may be applicable to the community supervision of female offenders. Programs incorporating the interpretation of trend data gathered at strategic intervals in order to diagnose and predict failures in their equipment may hold obvious applications to the assessment and prediction efforts in the criminal justice arena. The development of condition-based maintenance (CBM) programs and their essential component of reliability centred maintenance (RCM) have been making unprecedented contributions to the assessment, management and corrective actions on mechanical systems (Moubray, 1997; Smith, 1993). The RCM philosophy was born in the late 1960’s when the commercial aviation industry undertook a complete re-evaluation of preventative maintenance strategy. This was necessary due to the increased preventative maintenance requirements for the larger, more complex Boeing 747 aircraft. In fact, the FAA required so much preventative maintenance that the airlines could not operate the aircraft profitably as the jet was spending more time “in the shop” getting “just in case” work done than in the air (Dept. of Defense,

MIL STD 2173, 1986). Their “progress reports” may prove to be useful as research with dynamic risk predictors unfolds in corrections psychology.

As one peruses the literature on CBM and RCM and appropriately interchanges terminology from systems engineering to offender psychology the application becomes evident. When one considers the offender (machine part) as a member of society (system) who in optimal conditions is functioning and contributing to the system in a pro-social orientation/involvement this model may be worthy of further exploration for case management strategies in the community.

Condition-based maintenance is a keystone technology that encompasses a philosophy of maintenance that recognizes the fact that traditional preventive (calendar-based) maintenance is generally unsuccessful at controlling equipment failures and life cycle maintenance costs. CBM emphasizes the use of condition monitoring technology to reduce preventative maintenance, thereby reducing man-hours required for superfluous maintenance and support costs. Hence CBM has been defined as simply doing maintenance when it is needed (elevated criminogenic needs), rather than when it is scheduled (monthly or weekly scheduled appointments). CBM is enabled by predictive condition monitoring technologies that assess degrading equipment condition (increases in criminogenic needs) and predict when total failure (recidivism) may occur. By simply re-framing the risk principle of minimal services for low-risk offenders and intensive services for high risk individuals into a “maintenance” framework the CBM and RCM technologies become readily applicable in theory if not practice.

Because of the dynamic nature of criminogenic needs they are typically being monitored for changes, e.g., CIS. Fluctuations in their levels could call into action a tailored intervention plan to avert impending failure (recidivism).

Although CBM uses trending analyses, effective CBM is more than trending. It involves the development of condition indicators (or dynamic risk predictors) derived from an engineering understanding (social psychological theory) of the subject equipment (criminality of female offenders). Field measurements (assessment/measures from scales such as Community Intervention Scale) are condensed into condition indicators (needs domain) that imply the presence of a specific impending failure (recidivism/technical violation).

Industry has been using condition based maintenance and condition indicators for years to save maintenance resources and improve reliability (Smith, 1993). Industrial applications have typically experienced 35% to 50% of preventative maintenance (treatment programs) routines eliminated (Dept. Of Defense, MIL-STD 1629, 1986). Industry standards also states as much as 50% of all failures experienced are directly caused by maintenance actions. Reminiscent of a milestone study by Andrews and colleagues (1980) which produced results that showed if interventions were applied to an low risk group it produced a worse effect, than if they had received no intervention at all.

Such programs may require the acquisition, management, processing and storage of considerable amounts of data, data often never before monitored. Ultimately, reliability centred maintenance is a methodological process that optimizes maintenance (treatment services) with this primary objective - to

preserve system function (integration into community). In general, the process involves identifying system failures and failures of those functions.

Figure 1 – Schematic of RPM Application to Community Supervision Practices

Step 1 – Identify Offender's (Production) Resources

This step entails the identification of the offender's assets but also could encompass the identification of the resources available and necessary to provide services (conduct maintenance) for the female in the community, e.g., community services, personalized relapse plans. This would not have to be strictly limited to criminogenic related resources, but could encompass other needs of the female offender in the community (Shaw, 1992).

Step 2 – Define Treatment (Maintenance) Requirements

This is a critical step where it is decided what services will be for each offender and their identified needs (equipment asset and its components). The optimum mixture of corrective and preventative treatment services (maintenance) to be applied can be rationally established by considering

- The overall objectives of the treatment (maintenance) plan (e.g., reduce unemployment.)
- The operating context and consequences of failure of the offender (equipment)
- The known or likely offender's (equipment) failure modes and failure effects (based on any of the offender's own self-awareness, historical data available); and
- Services (technologies) available and feasible to address various needs (failures)

Step 3 – Plan Treatment Program (Maintenance Tasks)

It is at this step that one transcribes the treatment program (maintenance) requirements identified in Step 2 into a template" maintenance plan for each offender (different subject equipment type). Included in the template are the **suggested timing of services** (maintenance activities periodicity), skills/needs inventory (skills sets), the data to be gathered when services are in progress/completed (maintenance is executed) to provide **feedback** to the system.

Step 4 – Schedule Delivery of Services (Maintenance Tasks)

This step involves the creation of a maintenance plan that identifies the personnel to carry out the work and the **time frame** in which the services (maintenance) is to take place. The determination of this time frame is governed by the **intervals** identified in the maintenance plan and the ability of personnel and access to services (equipment). This step is typically executed from within the organization's work scheduling system.

Step 5 – Execute Service Programs (Maintenance Tasks)

This step involves the execution of services (maintenance tasks) and the recording, in the field, of the offender for performance feedback data.

Step 6 – Process Dynamic Risk Predictor (Maintenance) Data

This step involves

- The entry of offender and program feedback data into the maintenance tracking system
- The **comparison of obtained data with cut-off scores indicating relative position of offender to established parameters (condition indicators)**
- The comparisons of dynamic risk predictors (condition indicator) values to expected baselines to assess current offenders (equipment condition; and
- The execution of any diagnostic procedures to relate elevated needs assessments (abnormal conditions indicators) to the offender current

community functioning (affected equipment subsystems) and assess/suggest immediate intervention for corrective maintenance tasks to avert failure

Step 7 - Analyze Intervention (Maintenance) Effectiveness

This step involves the regular review of intervention (maintenance) programs as part of a **continuous improvement feedback loop**. Several factors would be reviewed: an examination of the effectiveness of the dynamic risk predictors (condition indicators), **timing of intervention** and program evaluation data leading to empirically-determined **optimal assessment intervals** (maintenance and data gathering intervals), and actual failures (recidivism data) to help refine the offender community management (maintenance) plan.

APPENDIX G

Percentage of Cases with Identified Needs

	Time 1	Time 2	Time3	Time 4	Last
Need Dimension	(n=497)	(n=264)	(n=138)	(n=68)	(n=497)
Employment	76.3	62.1	47.1	32.4	65.0
Family	54.7	49.2	39.9	25.0	48.7
Associates	53.7	43.9	32.6	22.1	48.7
Substance Abuse	34.4	19.7	13.0	14.7	29.2
Community	65.2	51.1	42.0	27.9	52.5
Personal/Emotional	72.8	67.8	52.2	39.7	66.6
Attitude	9.3	7.2	6.5	2.9	9.5

*Variables recoded indicating if need were absent/present.

APPENDIX H

Correlations Between Composite Measures and Type of Outcome

Composite Measure	Any Failure	Any Type of Reoffence	Non Violent Offence	Violent Offence
At Time 1 (n=497)	.15**	.13**	.10*	.11*
At Time 2 (n=264)	.22**	.22**	.19**	.11
At Time 3 (n=138)	.23**	.25**	.26**	.01
At Time 4 (n=68)	.25**	.14	.14	-
Last Assess (n=497)	.26**	.22**	.20**	.12**

*correlation significant at the 0.05 level (2-tailed)

**correlation significant at .01 level (2 tailed)

Correlations Between Composite Measures and Severity of Outcome

Composite Measures	Total Number of Offences	Number of Non-Violent Offences	Number of Violent Offences
At Time 1 (n=497)	.12*	.10*	.12**
At Time 2 (n=264)	.10	.09	.11
At Time 3 (n=138)	.20*	.20*	.01
At Time 4 (n=68)	.12	.12	-
Last Assess (n=497)	.16**	.15**	.11*

*correlation significant at the 0.05 level (2-tailed)

**correlation significant at .01 level (2 tailed)

Last Assess - Measure in Closest Temporal Proximity to Failure

Cox Regression and ROC Results: Composite Scores (Any Failure)

Composite Measure	-2Log				
	Likelihood with variable (without variable)	λ	Sig.	Hazard Rate	AUC (CI)
At Time 1 (n=497)	1178.94 (1196.83)	18.2	***	1.1	.61 (.55-.66)
At Time 2 (n=264)	358.18 (370.49)	13.1	***	1.2	.68 (.60-.76)
At Time 3 (n=138)	118.76 (124.93)	7.7	**	1.2	.74 (.62-.87)
At Time 4 (n=68)	26.51 (20.64)	5.1	*	1.9	.79 (.62-.97)
Last Assess (n=497)	1160.30 (1196.83)	37.8	***	1.2	.69 (.64-.74)

* significant at the 0.05 level

**significant at .01 level

***significant at .001 level

Hazard rate = represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

CI = 95% Confidence Intervals

Cox Regression/ROC Results: Composite Scores (Violent Failure)

Composite Measure	-2Log				
	Likelihood with variable (without variable)	λ	Sig.	Hazard Rate	AUC (CI)
At Time 1 (n=497)	234.00 (242.65)	8.6	.**	1.2	.61 (.55-.67)
At Time 2 (n=264)	47.80(50.92)	3.2	-	1.3	.67 (.59-.76)
At Time 3 (n=138)	9.8(9.8)	.00	-	1.0	.73 (.60-.86)
At Time 4 (n=68)	-	-	-	-	-
Last Assess (n=497)	232.71 (242.65)	10.2	***	1.2	.69 (.64-.74)

* significant at the 0.05 level

**significant at .01 level

***significant at .001 level

Hazard rate = represents the % change in the hazard rate for a unit increase in the covariate (relative risk)

AUC (Area under the Curve) = accuracy of predictor variable

- No cases available for analysis.