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Preliminary Exploration of Risk Assessment Predictors : Can Probationers who Re-Offend be Identified?

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Running Head: EXPLORATION OF RISK ASSESSMENT PREDICTORS

**Preliminary Exploration of Risk Assessment Predictors: Can Probationers Who
Re-offend Be Identified?**

Deborah Dawson

A Thesis Submitted in Partial Fulfilment of the

Requirements for the Award of

Bachelor of Arts (Psychology) Honours

Faculty of Health and Human Sciences, Edith Cowan University

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Abstract

A retrospective study of 243 male probationers who had been on community based orders in Western Australia for a mean time of 15 months, was undertaken to explore differences between re-offenders and non re-offenders. Discriminant function analyses were employed in a series of designs where the mediating effects of geographic location and Aboriginality and non Aboriginality were investigated. The analyses revealed that the best static predictor item for distinguishing between non re-offenders and re-offenders in the entire sample was offence type (Wilks Lambda, .88, chi-square 25.589, $df = 6$, $p < .0005$) and the best criminogenic need item was employment (Wilks Lambda, .96, chi-square 7.566, $df = 2$, $p < .05$). In regional areas, drug use was the primary predictor contributing to a function which significantly discriminated between re-offenders and non re-offenders (Wilks Lambda, .78, chi-square 12.557, $df = 4$, $p < .05$). The classification accuracy was 68% for grouped cases. This result was unexpected, as previous studies have consistently found static predictors to be primary predictors of risk. Analysis of the metropolitan area sub-sample produced results more consistent with previous findings. Offence type and number of breached orders loaded highly on a statistically significant function which satisfactorily discriminated between outcomes (Wilks Lambda, .81, chi-square 31.226, $df = 6$, $p < .0005$). The analysis of race produced similar results. The variables which had the highest loadings on the derived functions for both sub-samples were all static predictors of risk. Based on meta-analytic research outcomes of Andrews et al. (1990), it was also hypothesised that a chi-square analysis of court sanctioned probation conditions would reveal differences across re-offending outcome and the nature of the probation conditions.

The results were consistent with the finding that general correctional service combined with a judicial alternative produced greater reductions in recidivism than a judicial alternative alone. The outcomes related to geographic location and race reinforced the importance of assessing risk of recidivism on the basis of population-specific attributes. Despite several limitations associated with the research design, the exploration provided future directions for the development of risk models and the use of judicial alternatives to reduce recidivism.

Declaration

I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text.

Signature: _____

Date: _____

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Introduction

Background

Since the inception of intermediate sentencing and expansion of community-based correctional services, risk prediction has taken a more resonant role in offender management (Brown, 1996; Morgan, 1995). Within a historical context, this development appears to be a response to over-crowding in prisons and the “revolving door” characteristic of corrections in Australia, America, and the United Kingdom (Austin, 1993; Clements, 1996; Jones, 1994). Debate concerning the utility and purpose of risk prediction has led to research findings that highlight the importance of static, dynamic, and rehabilitative factors associated with offending behaviour (Andrews & Bonta, 1994; Gendreau, Little, & Goggin, 1996; Harris, 1994; Morgan, 1995).

Contemporary researchers of risk assessment attest to a combination of *static*, unchangeable risk factors (such as age of first offence) and *dynamic*, changeable risk factors (such as substance abuse) for increments in predictive quality and intervention utility (Andrews & Bonta, 1994; Brown, 1996; Clear, 1995; Gendreau, Little, et al., 1996). Interpretations of research outcomes have suggested that while static risk factors do not provide intervention *utility*, inclusion of such factors increases the *accuracy* of risk prediction (Gendreau, Goggin, & Paparozzi, 1996; Gendreau, Little et al., 1996). In contrast, dynamic risk factors or criminogenic needs have been found to be effective variable intervention targets for reducing offending behaviour (Andrews and Bonta, 1994; Andrews, Bonta, & Hoge, 1990; Andrews, Zinger, et al., 1990; Brown, 1996; Howells, Watt, Hall, & Baldwin, 1997). The construction of risk assessment tools, however, has been convoluted by findings that

suggest tools should not be applied on the presumption of homogeneity.

Interpretations of research outcomes have indicated risk factors occur in combinations unique to the demography and nature of offending populations (Andrews, Bonta et al., 1990; Brown, 1996; Clear, 1995; Clear & Gallagher, 1985; Howells et al., 1997; Quinsey, 1995).

The response by correctional services has been to validate population-specific tools that predict level of risk and are cognisant of intervention needs (Bonta, 1993; Brown, 1996; Clear, 1995; Ministry of Justice Western Australia (MOJ), 1996). In the West Australian Division of Community Based Corrections, risk and need assessment has been central to the Offender Assessment and Review System (MOJ, 1996). The rationale for risk/needs assessment came from interpretation of research findings which suggested the importance of intervention based on criminogenic need and a concentration on high-risk cases (MOJ, 1996a). As in many other Australian states, the Victorian-normed versions of the Wisconsin Risk and Needs Scales were adopted for assessment (Community Corrections Directorate, 1995). However, in line with the shift toward localised tools, the Wisconsin tools were expropriated as interim measures pending the development of a localised Actuarial Assessment Model (MOJ, 1996; MOJ, 1996a). The construction of the population-specific tool has been guided by interpretation of research outcomes relating to existing classification systems and from critical review of risk prediction. (MOJ, 1996a).

Classification Systems: Risk, Need and Rehabilitation

Classification in correctional settings has evolved from simplistic systems based on professional judgement to comprehensive systems grounded in risk and needs assessment (Gendreau, Goggin et al., 1996; Gendreau, Little et al., 1996). Bonta

(1993) has parsimoniously described this progression within the context of a developmental framework. He considers three generations of techniques to be characteristic of classification. First-generation systems encompass traditional approaches where the subjective judgements of clinicians formed classifications of risk. Second and third-generation systems have been described by Bonta (1993) as analogously actuarial in nature. However, the perceptible difference between these systems is the intent and capacity of third-generation systems to quantify and measure change.

While still common, the status of first generation classification has become diminished on the basis of being highly inaccurate (Bonta, 1993; Brennan, 1993; Gendreau, Goggin, et al., 1996). The second generation of classification systems, while progressive by virtue of their actuarial nature, have been limited by the inability to go beyond risk prediction (Bonta, 1993, Gendreau, Goggin et al., 1996). Despite the ability of these empirically-driven systems to reliably distinguish low from high-risk offenders, the contemporary focus on risk reduction has led to the demand for systems which also encompass management of risk (Andrews, Bonta, et al., 1990; Andrews, Zinger et al., 1990; Bonta, 1993). Third-generation systems therefore have the capacity to assign level of risk and target criminogenic need of offenders. As Bonta (1993) has stated;

... third generation offender assessments are inextricably linked to rehabilitation efforts. These assessments are not only concerned about such questions as to who should be paroled or how closely to monitor the offender but also what must be changed about the offender or the offender's situation to minimise the risk for re-offending (p 5).

Research outcomes from extensive meta-analyses investigating recidivism have suggested increases or reductions in criminogenic need correspond with increases or reductions in criminal behaviour (Andrews, Bonta, et al., 1990; Andrews, Zinger et al., 1990; Andrews & Bonta, 1994; Gendreau, Little et al., 1996). Criminogenic needs have been described as misanthropic cognitions, values, and behaviour. However, Andrews, Bonta et al. (1990), have warned that not all needs are criminogenic, stating the criteria for a need being classed as criminogenic should be where; “assessments of change (or retests) possess a level of predictive criterion validity that is incremental to the criterion validity of pretests” (p. 31). While a large body of research has produced need based results which meet the preceding criteria, the concept of criminogenic need also finds explanation in influential theories of criminal conduct (Andrews, Bonta, et al., 1990; Andrews, Zinger et al., 1990; Andrews & Bonta, 1994). As Andrews, Bonta et al., (1990) have hypothesised, the concepts of pro-criminal cognitions, sentiments and attitudes fall within the explanations of psychodynamic theory, social control perspective's, differential association theory, subcultural theory, labelling theory, anomie theory, conflict theory and social learning theory.

Intervention based on criminogenic need, however, has been found most successful when based on the responsivity principle (Andrews, Bonta, et al., 1990; Andrews, Zinger et al., 1990; Andrews & Bonta, 1994; Gendreau, Little, et al., 1996). The responsivity principle posits that intervention should be focused on intermediate targets (criminogenic need) and be delivered in a manner which is consistent with the offender's cognitive style (Andrews, Bonta, et al., 1990). Moreover, this approach combined with the risk principle, (which suggests that intervention be reserved for offenders assessed as high- risk) has proved more

effective than traditional attempts in reducing re-offending behaviour (Andrews, Zinger, et al., 1990).

The concepts of risk, need and responsivity, developed from reviews of scientifically controlled assessments of correctional treatment which found positive effects in at least 40% of evaluations (Andrews, Bonta et al., 1990). The pattern of effects suggested to researchers such as Andrews, Bonta, et al. (1990) that rehabilitative efforts were effective in some cases under certain circumstances. They hypothesised the linkages between case, intervention, and outcome were found in the principles of risk, need and responsivity. Andrews, Zinger, et al. 1990 meta-analytic research addressed this hypothesis and the outcomes demonstrated the major variation in effects in re-offending outcome was the extent to which intervention followed the principles of risk, need and responsivity. This research highlighted the value of appropriate correctional service and also substantiated the ineffectiveness of criminal sanctioning as a sole source of intervention. As Bonta (1993) has stated;

the main reason for this failure is, quite simply, sanctions do not target criminogenic needs ... Can electronic monitoring programs, boot camps, intensive supervision programs really change the substance abuse of some offenders or their antisocial attitudes ... beyond some general selection parameters (usually involving low risk offenders) how specific are the assignments? Not very (p. 6).

The principle of risk is fundamental to the success of selecting offenders who are most likely to benefit from intervention based on need and responsivity. An increasing body of evidence has supported the assertion that treatment effects are greater for offenders rated high-risk of re-offending (Andrews, Bonta, et al., 1990; Andrews, Zinger, et al., 1990; Brown, 1996; Gendreau, 1996). Brown (1996) found,

using a national random sample of 613 New Zealand parolees, that high intensity intervention produced no impact on re-offending outcome in a low-risk group of parolees, while reductions in re-offending behaviour were observed in a high risk group. Likewise, in a study where the full Wisconsin Client Management Classification system was used to match intervention to risk level, reductions in recidivism were only observed among medium to high-risk offenders (Andrews, Hoge, et al., 1990).

The shift toward third-generation systems acknowledges such findings, but also redresses the conflict between resource restriction and ballooning offender populations (Bonta, 1993; Gendreau, 1996). While statistically-derived systems have been found to increase accuracy, the incorporation of psychological principles provide a basis for both reducing risk and measuring such change. In the absence of criminological theories which assist reductions in recidivism (Schmidt & Witte, 1984; Schmidt & Witte, 1988), researchers such as Bonta (1993), Gendreau (1996), and Andrews, Bonta, et al. (1990) have advocated the principles of risk, need and responsivity as a means of grounding rehabilitative based classification in psychological theory.

This approach has been censured by mainstream criminologists as tautological, empirically unfounded, and impractical as; "probation officers spend so much time on presentence investigation and other duties that it is pure fantasy to expect them to follow the psychological principles"(Lab & Whitehead, 1990, p.408). Apart from the circularity of the argument concerning probation officers duties, such criticism is lacking in the face of empirical evidence which has supported this approach to rehabilitation (Andrews, Bonta, et al.,1990; Andrews & Bonta, 1994; Gendreau, 1996). Furthermore, the principle of need moves classification from a purely

statistically-derived undertaking (and criminologists' concern with tautological enterprise) and links the process with empirically-testable psychological theory and principles.

In an effort to examine the effectiveness of the risk, need and responsivity principles against traditional approaches Andrews, Zinger, et al. (1990) conducted an extensive meta-analysis of juvenile and adult correctional treatment studies. The studies produced 154 phi coefficients that outlined the magnitude and direction of the correctional intervention on recidivism. Andrews, Zinger, et al. (1990) found the three principles (termed appropriate correctional service) had the most significant effect on recidivism. The effect of appropriate correctional service (mean phi = .30) was significantly ($p < .05$) greater than that of general correctional service (.13), and both proved more proficient than inappropriate service (-.06) and criminal sanctioning (-.07).

Andrews, Zinger, et al. (1990) concluded; "that neither criminal sanctioning without provision of rehabilitative service, nor service without reference to clinical principles of rehabilitation will succeed in reducing recidivism" (p. 369). Moreover, interpretation of these research outcomes and latter studies have discounted the effectiveness of; a) psychodynamic and client-centred therapy; b) sociological strategies based on subcultural or labelling approaches to crime; c) programs based on punishment and sanctions; d) targeting low-risk offenders and non criminogenic needs; and e) focus on single causes of offending behaviour (Andrews, Zinger, et al., 1990; Andrews & Bonta, 1994; Blackburn, 1993; Gendreau, 1996).

Conversely, review of Lipsey's extensive 1992 synopsis of 443 programs, led Gendreau (1996) to state six points which he found to be consistent across the programs which reduced re-offending;

1. The services were intensive, usually of a few months duration, and were based on differential association and social learning conceptualisations of criminal behaviour.
2. The programs were behavioural, primarily of the cognitive and modelling type and targeted criminogenic needs of high risk offenders.
3. Programs adhered to the responsivity principle, that is, they were delivered in a manner that facilitated the learning of new prosocial skills by the offenders
4. Program contingencies were enforced in a firm, fair manner, with positive reinforcers greater than punishers by at least 4:1.
5. Therapists related to offenders in interpersonally sensitive and constructive ways and were supervised appropriately.
6. Program structure and activities reached out into the offenders real-world social network and disrupted the delinquency network by placing offenders in situations ... where prosocial activities predominated (p 149).

Contemporary Classification Systems

The concept of need assessment in the criminal justice system has been a recent development, and systems that exhibit predictive validity are uncommon (Bonta, 1993; Gendreau, Little et al., 1996; Gendreau, Goggin, et. al, 1996). Consequently, contemporary classification systems fall broadly between second and third-generation assessment (Bonta, 1993). Studies of early systems such as the Megargee MMPI, Quay's Aims and the I-Level have suggested although these systems separated offenders on the basis of treatment needs, predictive validity has been rarely demonstrated (Andrews, Bonta, et al., 1990; Bonta, 1993). More progressive systems such as the Level of Supervision Inventory (LSI) and the Wisconsin

classification system appear to have gone some way in meeting both criteria (Baird, 1981; Bonta, 1993; Harris, 1994).

The Wisconsin risk and needs assessments have been found to address criticism concerning the predictive validity of classification systems and capacity to locate criminogenic need (Baird, 1981; Bonta, 1993; Harris, 1994). In a study of 14,000 probationers, Bonta (1993) found the risk scale (and to a lesser extent the combined score of the Needs Assessment) predicted beyond chance success or failure to complete probation or parole orders. Although, the risk scale has been subject to several revisions (many for transference to other locations), the original version has been found to be an accurate measure of probation and parole revocation in the State of Wisconsin (Baird, 1981; Bonta, 1993).

The risk items were selected on the basis of a stepwise discriminant analysis of factors found to be central to offending behaviour of probationers and parolees in the State of Wisconsin. These factors were found to account for 58 % of the variance of re-offending behaviour while on probation or parole (Glaser, 1987). The total risk scores have proved to be an accurate means of discriminating probationer and parole revocation. As Glaser (1987) found in a population with a base rate of 11.3% revocations, recidivism only varied from 1 % for one-eighth of those rated low-risk to 39 % for one-eleventh of cases rated high risk.

Moreover, the full Wisconsin Client Management Classification (CMC) system which incorporates the Risk and Needs Assessment scales to match intervention to risk level, has produced promising recidivism outcomes (Andrews, Hoge, et al., 1990). In a study conducted by the Texas Board of Pardons, parolees were classified by the Wisconsin system and assigned to either regular or CMC supervision. After a six month period, the CMC system had been the most effective means of reducing

recidivism (Andrews, Hoge, et al., 1990). Despite the utility of the Wisconsin system, and widespread application (it has been labelled the most highly-applied system throughout the United States of America), the LSI represents a closer emulation of third generation systems (Bonta, 1993).

In contrast to the Wisconsin system the LSI incorporates both static and dynamic (criminogenic needs) risk factors into one scale. Change and the level of supervision is monitored through successive re-assessment (Bonta, 1993). Furthermore, as Gendreau, Cullen, et al. (1994) have suggested, the LSI and the Community Risk/Needs Management Scale have been the only tools expressly constructed on the principles of risk and need. The LSI, however, has transcended most other systems in demonstrating dynamic risk validity in studies which have examined the relationship between *change in needs* and *recidivism* (Bonta, 1993; Motiuk, Motiuk, & Bonta, 1992). Importantly, the LSI has also been found to be a reliable and valid measure. As Motiuk et al. (1992) found upon review, the LSI has demonstrated internal consistency ($\alpha = .72$), inter-rater reliability ($r = .94$), and temporal stability ($r = .80$) with probationers. Likewise, they found total LSI score to be predictive of probationer recidivism ($r = .47$), recidivism post intervention ($r = .47$), and severity of re-offending behaviour ($r = .39$).

Risk Prediction

Despite the central role of prediction in criminal justice, classification based on the prediction of risk has been controversial for historical, conceptual and methodological reasons (Brennan, 1993; Jones, 1994). Reviewers such as Jones (1994, pi) suggest there has been; “a plethora of poorly conceptualised and/or conducted research studies, and a tendency among practitioners to accept, almost

without question, unvalidated off the peg risk instruments". In tandem with the issues of conceptualisation and methodology, risk prediction has historically vacillated over debate concerning statistical versus clinical and theoretical prediction (Brennan, 1993; Glaser, 1985; Gottfredson, 1987).

Interpretation of research outcomes, however, would suggest clinical prediction is antiquated. Statistically constructed prediction tools have consistently been shown to surpass clinical predictions in decision making settings (Brennan, 1993; Gendreau, Little, Goggin, & Paparozzi, 1996; Gottfredson, 1987). In a study conducted by Holland, Holt, Levi, and Beckett (1983) prediction of recidivism based on a statistical composite constantly exceeded predictions made by correctional case workers and mental health professionals. Wormith and Goldstone (1984) found actuarial tables based on objective data also exceeded the subjective predictions of clinical staff and could not be significantly improved by integration of the subjective data. Overall, as Glaser (1985) and others have concluded from extensive reviews of published comparisons, statistical prediction outperforms human judgement in virtually every arena concerned with prediction of future behaviour (Brennan, 1993; Gendreau, Little, et al., 1996; Gottfredson 1987; Holland et al., 1983).

Notwithstanding the increased accuracy over clinical prediction, statistical prediction has been demarcated by limitation and ostensibly inherent flaws (Brennan, 1993; Glaser, 1985; Gottfredson, 1987). Since the 1950s the issue of base rates has remained central to discussion concerning the accuracy and efficiency of statistically-derived risk prediction methods (Brennan, 1993; Gendreau, Little, et al., 1996; Gottfredson, 1987). Put simply, the *efficiency* of prediction is the extent to which the classification system *improves the prediction* that all individuals will be characterised by the *base rate or frequency* of the *criterion* (outcome such as re-

offending) in the population. As Gottfredson (1987, p 25) has stated, "the more frequent or infrequent an event, the greater the likelihood of inaccurate prediction". In essence, the complexity of prediction augments as the base rate differs from .05 . Therefore, if the base rate is 40 %, the "least-error prediction is that none will have the criterion, but if the base rate is 55 percent, the most accurate prediction is that everyone will have the criterion (Glaser, 1987, p. 259).

Thus, the efficiency of the predictor is not only contingent on the correlation with the criterion, but also the base rate within the population (Blackburn, 1993; Rice & Harris, 1995). The importance of base rates to prediction outcomes has been expressed by theorists as two prediction errors. These errors termed 'false positives' and 'false negatives' have been the source of much ethical debate in prediction (Blackburn, 1993). False positives represent persons predicted to offend who do not offend and false negatives represent persons predicted as not likely to offend and who do offend (Blackburn, 1993; Farrington, 1987). As Blackburn (1993, p 323) has stated, "a high false positive rate is undesirable from a civil liberties perspective, since the predictor results in the continued detention of many who are safe".

Concern about false negatives has manifested at the service delivery level as over-classification. Several theorists have found override of risk level occurs in an effort to circumvent the early release or under-supervision of persons perceived to represent false negatives (Bonta & Motiuk, 1992; Clear & Gallagher, 1985; Schneider, Ervin & Snyder-Joy, 1996). False negatives and positives have also been addressed at a statistical level, through the alteration of the selection ratio or dimension deemed positive by the predictor (Blackburn, 1993; Gottfredson, 1987). However, alteration of the selection ratio results in an accuracy trade-off. As

Blackburn (1993) has stated, if the cutting point is raised to decrease the number of false positives, the end result is also a reduction in the true positive rate.

The development of prediction instruments which identify a minority of the population as cases (for example violent recidivists) is especially hampered by base rates. Effective predictors are difficult to extract because the variation in the criterion is reduced (Gottfredson, 1987). Low base rates necessitate predictors having higher correlations with the criterion than normally found in actuarial prediction. The equally difficult alternative is the identification of predictors in a population of cases with a base rate approaching 50% (Blackburn, 1993; Gottfredson, 1987). The consequences of low base rates has been explained with parsimony by theorists such as Blackburn (1993). When a predictor found to have 80% accuracy in a sample with a base rate of 50% is applied to a new sample with a 10% base rate, the false negative rate equals 2.7% and the false positive rate equals 69%. Therefore, if the criterion is re-offending behaviour, more than two thirds predicted to re-offend will not. Moreover, as Blackburn (1993, p.325) has suggested, although the predictor has 80% overall accuracy, a "blanket" prediction that the entire sample would not re-offend would have been as accurate.

Overall, the statistical limitations of prediction generally manifest as ethical implications in criminal justice settings. Tonry (1987) has taken such implications into account and has cautioned the benefits must be balanced against;

the appropriateness of increased punishment or state intrusion into the lives of those predicted to be dangerous, the disparities in outcome that result from use of predictions, the low levels of accuracy of such predictions, and their disparately harsh impact on minorities (p.367).

The converse is the issue of community safety and when balanced against the rights of offenders, leaves the field of criminology with an ethical paradox where; "the defendants right not to be a false positive must be balanced against the publics right not to be set on by a false negative" (Gottfredson, 1987, p.13).

Resolution of this conflict is not apparent, however, the answers appear to be embedded in the purpose and accuracy of risk prediction instruments. Questions concerning the accuracy of prediction are linked to methodology, the appropriateness of criterion and predictor variables and the potential of the statistical analyses to address the unique problems encountered in criminological research.. Ethical concern is inflated when such factors are overlooked, the purpose of risk prediction is narrow and the proficiency of tools based on prediction are overestimated.

Criterion Variables

While the investigation of static and more recently dynamic predictors of risk has been comprehensive, the confounding element in the collective findings is generally the criterion or outcome measure (Jones, 1993). Criterion variables are generally immutable estimators of justice oriented outcomes. Dichotomous evaluation, does not account for reduced or less serious offending behaviour, and nor does it discern between convictions for non-compliant probation behaviour (breaches of order) and serious offending behaviour (Gottfredson, 1987). As Villeneuve and Quinsey (1995) found in a study of 120 violent offenders, the re-arrest rates for the sample varied with the definition of recidivism. An arrest for any offence, resulted in a 78.3% failure rate, an arrest for any violent offence produced a 49.6% failure rate and 16.7% failure rate resulted from an initial re-arrest of severe violence. Gottfredson (1987) and Jones (1993) suggest this confound can be tempered if definitions of the

criterion variable are closely related to a specific purpose, but concede that the goal of future assessment should be to increase validity through the use of continuous criterion.

Careful consideration of the limits of criterion variables, however, was evident practice in several studies reviewed for the present study. An excellent example was provided by Broadhurst and Maller (1990). The researchers overcame the limitation of dichotomous criterion (non return or return to prison), by examining difference in outcome due to legal disposition, new offence type, forms of sentence and release, length of sentence, prison regime and intervention. The study also importantly included analysis of several criminogenic needs items (employment, participation in pre-release work programs and finances) which were considered to influence parole adjustment. If the use of dichotomous criterion is to continue, careful consideration of potential confounds such as Broadhurst and Maller's (1990) will produce more valid and relative assessments of re-offending behaviour.

Static and Dynamic Predictors of Risk and the Assumption of Homeogeneity

Discussion of static predictors of risk is perhaps the main area where broad agreement is found in the literature concerning re-offending behaviour. Age, past criminal history, age of first conviction, institutional behaviour (number of breaches or revocations of orders) and offence type have been found to be consistently reliable predictors of risk (Gendreau, Little, et al., 1996; Gendreau, Goggin, et al., 1996; Jones, 1993; Monahan, 1996). The point of divergence, however, is debate surrounding social class, intelligence and personal distress variables (Gendreau, Little, et al., 1996). Gendreau, Little, et al. (1996) have attempted to address this debate by examining the predictive utility of these predictors using meta-analytic

techniques. It would appear, tentative support was found for the conclusion that these variables were at best moderate predictors over long periods of time and at worst uncorrelated with recidivism.

More positive findings have been found for less theoretically contentious static predictors of recidivism in probation populations. In a review of predictors of probation outcome, Morgan (1995) concluded that most studies conducted on probationers had provided support for a strong association between age and recidivism. In Australia, this finding has been replicated in studies conducted by Broadhurst and Maller (1990) and Roeger (1994). In a Western Australian study, Broadhurst and Maller (1990) found 63% of Non-Aboriginal and 86% of Aboriginal offenders aged under twenty years returned to prison. Whereas, only 35% of Non-Aboriginal and 59% of Aboriginal offenders over forty years were returned. Roeger (1994) reported similar findings, finding that South Australian Aboriginal offenders who did not have juvenile records were 50% less likely to be returned to prison.

The Australian research was also concordant with outcomes from other countries, in that, age coupled with prior convictions were found to be primary static predictors of recidivism. In a study of 266 Tennessee probationers Morgan (1995) found a significant relationship between probation outcome and prior criminal history. Interpretation of the research outcome suggested probationers with greater numbers of prior adult or juvenile probation orders were less successful on probation. Morgan (1995) concluded, as other researchers had found, that the likelihood of probation failure increased as the number of prior orders increased (Petersilla, 1987). Roeger's 1994 study of Aboriginal offenders suggested that not only did a previous sentence increase the risk of re-offending by double, but it was also predictive of an offence which would lead to a prison sentence. The logical consequence of these criminal

history characteristics is breached orders, thus it is hardly surprising this variable is also predictive of recidivism. Offence type (current offence) and prior offences have also been found to be particularly salient predictors of recidivism across offending groups. Property and burglary offences have been cited as offences with the highest re-arrest rate and the dubious distinction of predicting probation failure with the most accuracy (Morgan, 1995).

While much is known about static predictors of risk, investigation of dynamic predictors has been a more recent enterprise. Studies of both predictor domains have indicated dynamic variables such as companions, drug and alcohol use, social achievement, and family support systems are significant predictors of recidivism. Recent research has illustrated the importance of assessing these variables and others such as employment, education, and financial position to explain recidivism as a function of factors (race, gender, geographic location) which mediate re-offending outcome (Morgan, 1995; Gendreau, 1996; Gendreau, Little et al., 1996). In Australia studies which provide comparisons between Aboriginal offenders between states, and differences compared with Non-Aboriginals within states, provide insight into the potential of assessment which acknowledges such differences (Broadhurst & Maller 1990; Roeger, 1994).

Substantial empirical evidence has supported a link between employment and re-offending outcome (Bonta, 1989; Gendreau, Little et al., 1996). Broadhurst and Maller (1990) found the recidivism probabilities for both Aboriginals and Non-Aboriginals who were employed at arrest were lower and the likelihood of a successful outcome for parole was lower if employed upon release. Morgan (1995) found in a study of 266 male and female probationers that inadequate employment was major source of variation in successful probation completion. Moreover, the

findings also indicated that majority of probationers who were unemployed were convicted of a property offence (including burglary) and were more likely to have subsequent convictions for the same offence while on probation.

Education appears to be a dynamic predictor which produces variation in outcome across groups. Roeger (1994) found South Australian Aboriginals who had only reached a primary school level of education were at over twice the risk of re-offending than those who had completed or part completed secondary education. Broadhurst and Maller (1990) found the converse, in that, educational level made no difference to the outcome of risk in Western Australian Aboriginals. Lower levels of recidivism were found however, for male Non-Aboriginals who had had 11 or more years of schooling. What these outcomes and outcomes from other studies suggest, is that risk prediction cannot be assumed to be an enterprise where 'one size fits all' and transference of tools can only be justified on the basis of validation results.

Statistically derived prediction tools are based on the premise that evidence of criminological characteristics (behaviours observed in groups of re-offenders) increase the likelihood of re-offending behaviour. Thus, such predictions are subject to the normal error rate associated with probability. This error rate becomes magnified when a classification system designed for one population is transferred to another for which it is not valid (Clear & Gallagher, 1985; Andrews, Bonta et al., 1990; Clear, 1995; Quinsey, 1995; Brown, 1996; Howells et al., 1997). Given the large body of evidence which has suggested classification systems are not immutable across populations, and that systems such as the Wisconsin include policy driven factors (such as the assaultive offence item), it would seem esoteric that the practice of employing unvalidated tools has persisted (Wright, Clear & Dickson, 1984).

Wright et al. (1984) tested the assumption that a tool found to be reliable and valid for one population could be transferred to another within the same country. The Wisconsin risk-assessment tool was used on a random split-half validation sample of 366 probationers from the state of New York. The outcome suggested address change, percentage of time employed, alcohol and drug usage, prior periods of supervision, number of breached orders, and offence type were unrelated to outcome. Wright et al. (1984) conclude that while the Wisconsin risk- assessment produced a fair classification rate, the explanatory power (as measured by R^2) was poor.

This type of outcome has not been limited to geographic difference, but has also been found for differences across gender, and race. In a review of the status of classification for women, Fowler (1993) concluded that the use of classifications tools on the premise of gender neutrality resulted in the general misclassification of women. Women scored higher on social and economic predictors less associated with recidivism while men in comparison scored higher on criminal history variables. In a study of the Massachusetts probation system, family structure was found three times as significant predictor of probation for women compared to men. Likewise, Bonta, Pang & Wallace-Capretta (1995) found in a study of female prisoners, reliable predictors of male recidivism such as criminal associates and involvement in drug use, were far less valid for the prediction of female recidivism.

Comparison of criminality between ethnic groups in many Western countries has largely been focused on the inequality of judicial disposition (Clayton, 1983; Homel, 1996) In Australia, interest in the difference between Aboriginal and Non-Aboriginal offenders gained momentum for the most appalling of reasons. The Royal Commission of Aboriginal Deaths in custody in the latter parts of the 1980's

and extreme over-representation of Aboriginal persons in custody resulted in a surge of research examining the plight of indigenous offender (Braithwaite, 1989; Fergusson, Horwood & Lynskey, 1993; Homel, 1996). Limited studies conducted in Australia, the United States of America and Canada have found race is not always a mediating factor in court decisions and recidivism appeared to differ as a function of criminological factors across ethnic groups.

In Canadian study of native Canadians and non native Canadians using the LSI, Bonta (1989) found some differences across predictors (alcohol use and education for natives; accommodation literacy and finances for non natives) warranted the re-weighting of items on the basis of race. In Western Australia, Broadhurst and Maller (1990) found a lower recidivism rate for released male Non-Aboriginal prisoners in period between 1975-1987 who had eleven or more years of schooling. Educational status, however, did not alter offending outcome in the Aboriginal group during this period. The converse was found by Roeger (1994) in South Australian population of Aboriginals who had either been released from prison or were undertaking community supervision orders. Those who had only partly or fully completed primary school were at over twice the risk of re-offending than those who had completed a part secondary education. These outcomes suggest that not only do ethnic groups differ across predictors, but also sub-groups of ethnic offenders who are again distinct on the basis of geographic location.

The combined research of ethnicity, gender and geographic location reinforce the need to investigate the utility of predictors in the population of interest. Static predictors of risk appear to be the unifying ground of homogeneity for most sub-groups of offenders. Age, past criminal history, age of first conviction, institutional behaviour (number of breaches or revocations of orders) and offence type have been

found to be consistently reliable predictors of risk in general offending populations (Gendreau, Little, et al., 1996; Gendreau, Goggin, et al., 1996; Jones, 1993); ethnic populations (Bonta, 1989; Broadhurst & Maller, 1990; Roeger, 1994); and violent populations (Bonta, Harman, Hann & Cormier, 1996; Gendreau, Little et al., 1996; Harris, Rice & Quinsey, 1993).

What appears to prohibit the broad use of classification systems is the importance (weighting) given to predictors and unique sets of dynamic risk predictors which are distinct to the re-offending behaviour between and within sub-groups of offenders. The consequence of disregarding such findings raises not only serious ethical concerns, but also has implications for the allocation and provision of intervention. As Gendreau (1996) has judiciously stated of the risk, need and responsivity principles;

The effectiveness of this theory is dependent on (a) whether the assessment literature is clear as to what risk factors are predictive of criminal behavior and (b) whether any measures have been developed that have demonstrated adequate predictive validity in this regard (p.147)

The Present Study

In summary, there has been limited investigation in Western Australian of the static and dynamic risk factors which differentiate male probationers who re-offend (Roeger, 1994). Moreover, such investigations have rarely taken into account the mediating effects of geographic location, race and rehabilitative approach. The identification of population-specific attributes is intrinsically linked to parsimonious assessment, intervention and the reduction of recidivism.

The present research design was focused on identifying risk and needs factors which characterise Western Australian probationers who re-offend. The purpose of the research was twofold. The first related to the construction of the Ministry of Justice Western Australian actuarial model. It would seem prudent that construction of a population-specific model be guided by exploration of items in the interim model found to be relevant or redundant to the prediction of risk in the population.

The issue of relevance extends to geographic or demographic difference in the population under investigation. As both Bonta, Pang, et al. (1995) and Fowler (1993) found, reliable predictors of male recidivism, do not necessarily transfer as reliable predictors of female recidivism. Such difference has also been found among ethnic and geographically different groups (Bonta, 1989; Broadhurst & Maller, 1990; Roeger, 1994). Thus, the present research explored geographic and ethnic factors which may mediate re-offending behaviour in a male population of probationers.

The second purpose of the study related to the provision of appropriate intervention services. It was expected that the present research would profile criminogenic need characteristics of Western Australian probationers who re-offend. Moreover, it was expected that the research outcomes will indicate differences (or lack of) in criminogenic need across the regional and ethnic sub-groups.

The effect of probation conditions (interventions) on re-offending outcome in probationers who were rated medium to high-risk (of re-offending) was also explored in the present study. Based on the interpretation of the meta-analytic research outcomes reported by Andrews, Zinger, et al. (1990) it was anticipated that a criminal sanction (or a judicial alternative) such as community work would not have a positive association with re-offending outcome when used as a single measure of intervention. In comparison, 'specialist interventions which target

criminogenic need', and 'specialist interventions combined with community work', were anticipated to have a positive association with re-offending outcome.

While a complete investigation would have included the risk, responsivity, and need principles in their entirety, the proposed analysis was closer to the economic and organisational reality of correctional intervention (Lab & Whitehead, 1990; Clear, 1995). Put simply, as Brown (1996, p. 437) has suggested of the New Zealand correctional system; "organisational or contextual factors that shape the decision-making and program environments may influence or mediate effects of the treatment principles...". Brown (1996) concluded, that despite demonstrated utility, heuristic concepts such as the risk principle represented a point of divergence for decision-makers. The present study was designed with the intent of demonstrating that existing approaches taken by differing arms of the justice system could be linked together as complementary rehabilitative principles.

The following four exploratory research questions and one hypothesis generated the present research design. The questions and hypothesis were grouped in the general areas of; risk, criminogenic need and offending status; geographic location and offending status; Aboriginality, Non-Aboriginality and offending status; and intervention and offending status.

Risk, criminogenic need and offending status

The exploration of difference in re-offending outcome as a function of static and dynamic predictors of risk was guided by the following two research questions.

1. Risk, need and offending status: Do the risk and need items comprising the Victorian normed Wisconsin Risk and Needs Assessment Tools differentiate re-offenders from non re-offenders in a West Australian sample of probationers?

2. Criminogenic need and offending status: Do the criminogenic needs items comprising the Victorian normed Wisconsin Risk and Needs Assessment Tools differentiate re-offenders from non re-offenders in a West Australian sample of probationers?

Risk, need, geographic location and offending status

Geographic difference was distinguished by a separation between metropolitan and regional areas. The exploration of difference in re-offending outcome as a function geographic location was guided by the following two research questions.

3a. Risk, need, regional location and offending status: Do the risk and need items comprising the Victorian normed Wisconsin Risk and Needs Assessment Tools differentiate regional re-offenders from regional non re-offenders in a West Australian sample of probationers?

3b. Risk, need, metropolitan location and offending status: Do the risk and need items comprising the Victorian normed Wisconsin Risk and Needs Assessment Tools differentiate metropolitan re-offenders from metropolitan non re-offenders in a West Australian sample of probationers?

Risk, need, Aboriginality and Non-Aboriginality and offending status

The present research investigated ethnic difference as a function of Aboriginal and Non-Aboriginal origin. The ethnic distinction was anticipated to provide a replication of primary predictors of recidivism found by Broadhurst and Maller (1990) for 16,381 Aboriginal and Non-Aboriginal Western Australian offenders. Furthermore, the findings of Roeger's (1994) study of 442 male Aboriginal offenders were expected to provide a tentative comparison of predictors of risk in Aboriginal offenders across two Australian states.

Exploration of difference in re-offending outcome as a function of Aboriginality and Non-Aboriginality was guided by the following two research questions:

- 4a. Risk, need, Aboriginality and offending status: Do the risk and need items comprising the Victorian normed Wisconsin Risk and Needs Assessment Tools differentiate Aboriginal re-offenders from Aboriginal non re-offenders in a Western Australian sample of probationers?
- 4b. Risk, need, Non-Aboriginality and offending status: Do the risk and need items comprising the Victorian normed Wisconsin Risk and Needs Assessment Tools differentiate Non-Aboriginal re-offenders from Non-Aboriginal non re-offenders in a Western Australian sample of probationers?

Risk level, intervention and offending status

The present research was limited to investigation of recidivism outcome as a function of a criminal sanction or judicial alternative (community work), and intervention specific to four classes of criminogenic need (four specialised interventions). Due to unavailability of data, the principle of matching intervention to the offender's cognitive style (responsivity) and the theoretical or clinical approach underlying the classes of intervention could not be investigated. The small sample size of the present study prohibited the exploration of differences across low-risk of re-offending groups. The results were anticipated to demonstrate the functional utility of interventions in reducing recidivism in medium to high-risk of re-offending groups.

5. Risk level, intervention and offending status: In order to explore the effect of probation conditions (specialised interventions) and judicial alternatives (community work) on re-offending outcome in medium to high-risk probationers the following

hypothesis was stated: Re-offending and non re-offending status will differ significantly across the conditions of 'community work alone', 'specialised interventions alone', 'community work combined with specialised interventions' and 'no interventions' in probationers who have been rated medium to high risk of re-offending.

Method

Definitions and Parameters of the Present Study

The following standardised definition of risk predictor and three dichotomised criterion were adopted:

Risk predictor: In order to maintain standardised collection of both static and dynamic risk predictor data, the predictors were defined as the static and dynamic risk items comprising the Victorian Normed Wisconsin Risk and Needs Tools.

1. **Re-offenders and Non Re-offenders:** Probationers found guilty by a court of law of a new offence while on probation were defined as re-offenders. Probationers who had not been found guilty of a new offence while on probation were defined as non re-offenders.
2. **Aboriginal and Non-Aboriginal probationers:** Probationers who were stated as persons of Aboriginal origin on their community corrections intake were defined as Aboriginal probationers and persons of any other origin were defined as Non-Aboriginal probationers.
3. **Metropolitan probationers** were defined as those under the supervision of the Fremantle, Joondalup, Maddington, Midland, Mirrabooka and Perth community corrections offices. **Regional probationers** were defined as those under the supervision of the Albany and Bunbury community corrections offices.

Research Design

The four research questions generated a prediction design where the purpose was to extract a linear combination of predictor (independent) variables which maximised differences between the grouping (dependent) variables. Discriminant function analysis was employed for this purpose. The analysis strategy was considered an optimal means of identifying primary predictors and providing rates of classification accuracy. This approach has been previously adopted by Klassen and O'Connor (1988) to achieve an accuracy rate of 85 % for grouped cases in the generally precarious area of violence prediction.

The predictor and grouping variables were the following for each of the four research questions.

Risk, criminogenic need and offending status

Risk, Criminogenic Need and Offending Status: The grouping variable was two levels of offending groups, group1 (re-offenders) and group 2 (non re-offenders) and the predictor variables were items comprising the Risk and Needs Assessment Tools.

Criminogenic Need and Offending Status: The grouping variable was two levels of offending groups, group1 (re-offenders) and group 2 (non re-offenders) and the predictor variables were the criminogenic need items comprising the Risk and Needs Assessment Tools.

Risk, need, geographic location and offending status

Risk, Need, Regional Location and Offending Status: The grouping variable was the two levels of regional groups, group1 (regional re-offenders) and group 2 (regional non re-offenders) and the predictor variables were items comprising the Risk and Needs Assessment Tools. Risk, Need, Metropolitan Location and

Offending Status: The grouping variable was the two levels of metropolitan groups, group 1 (metropolitan re-offenders) and group 2 (metropolitan non re-offenders) and the predictors were items comprising the Risk and Needs Assessment Tools.

Risk, need, Aboriginality and Non-Aboriginality and offending Status

Risk, Need, Aboriginality and Offending Status: The grouping variable was two levels of Aboriginal groups, group 1 (Aboriginal re-offenders) and group 2 (Aboriginal non re-offenders) and the predictors were the items comprising the Risk and Needs Assessment Tools. Risk, Need, Non-Aboriginality and Offending Status: The grouping variable was two levels of Non-Aboriginal groups, group 1 (Non-Aboriginal re-offenders) and group 2 (Non-Aboriginal non re-offenders) and the predictors were the items comprising the Risk and Needs Assessment Tools.

Risk level, intervention and offending Status

The dependent variable was the two levels of offending status (re-offending and non re-offending). The independent variables were community work alone, specialised interventions alone, community work combined with specialised interventions and no intervention.

Participants

Two hundred and forty three male probation clients of Community Based Corrections (Western Australia) with a mean age of 27 years ($SD = 8.1$) gave consent for material from their community corrections files to be used in the study (attrition rate = 7 participants). Each participant met the research criteria of having complete Risk and Needs assessment forms and had been on probation no less than

six months. Participants who had been on a order less than six months were excluded to ensure a minimum follow-up period.

The participants were recruited from a geographic pool represented by 120 justice service locations distributed throughout the metropolitan area and regional towns. The resulting non-random distribution of participants by supervision region was; Albany, 26; Bunbury, 35; Fremantle, 24; Joondalup, 31; Maddington, 31; Midland, 31; Mirrabooka, 32; and Perth City, 33.

A total of 214 participants with a mean age of 27 years ($SD = 7.9$) were included in the final analysis. 157 participants were supervised in the metropolitan area and 57 in regional areas. In the metropolitan area 32 of the participants were Aboriginal and 125 Non-Aboriginal. In the regional area 27 participants were Aboriginal 30 were Non-Aboriginal.

The mean length of time spent on probation was 15.3 ($SD = 5.8$) months. Of the participants, 88 (41.1%) had spent six to twelve months on probation, 85 (39.7%) thirteen to eighteen months, and 41 (19.2%) nineteen months or longer.

Table 1 indicates the offending behaviours of the participant sample. Refer to Appendix A(i) for offence types included in each of the categories.

Of the 214 participants, 116 had been found guilty of a new offence while on probation. Of these participants, 63 (54.3 %) had been on the order one day to six months, 39 (33.6 %) seven to twelve months, and 14 (12.1 %) thirteen to eighteen months. The distribution by race was 36 Aboriginal and 80 Non-Aboriginal.

Table 1

Distribution of Offence Types as a Function of Race and Region

Offence Type	<u>Regional</u>		<u>Metropolitan</u>		Total
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	
Armed/Threat/Kidnap	0	2	1	7	10
Assault	7	4	10	16	37
Breach	2	1	1	3	7
Burglary/Robbery	4	4	11	34	53
Damage/Steal	7	4	2	28	41
Drug Offences	0	5	1	10	16
Forge/Utter/Decep	0	2	2	6	10
Sex Offences	0	4	0	13	17
Traffic	7	4	4	8	23
Total	27	30	32	125	214

Table 2 indicates the interventions undertaken by participants as a function of racial group and geographic location. All participants had either undertaken the intervention or it was in progress at the time of the study (for re-offenders prior to a finding of guilt). Table 1A in Appendix A (ii) provides a breakdown of specific intervention types and the combinations of community work and specific interventions.

Table 2

Distribution of Intervention Types as a Function of Race and Region

Intervention	<u>Regional</u>		<u>Metropolitan</u>		Total
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	
C/Work _a	8	5	14	48	75
Specialist _b	8	10	3	28	49
Combined _c	5	5	10	30	50
No Intervention	6	10	5	19	40
Total	27	30	32	125	214

_a C/work = Community Work _b Specialist Intervention = Specific Counselling

Types _c Combined = Community Work and Specific Counselling Types

Materials

The materials were the participants Community Corrections file notes which indicated if a participant had or had not re-offended during probation and the length of time spent on probation (for re-offenders this was the length of time prior to re-offending behaviour). The files were also scrutinised for age, current offence, evidence of Aboriginal, Non-Aboriginal origin, region of supervision and conditions/interventions which had been undertaken or were in progress at the time of the study (or prior to re-offending behaviour). Each participant's score on the items comprising the Victorian normed versions of the Wisconsin Risk and Needs instruments was also recorded from the file notes (Appendix B(i) for Risk; Appendix B(ii) for Need). These assessments had been completed by Community Correction officer's at the time of the probation order intake.

Instruments

The Wisconsin Risk and Needs instruments were developed from variables elicited from a sample of closed cases drawn from the state of Wisconsin. Poor predictors were eliminated using a bivariate procedure and regression analyses were conducted on the outcome of cases for the remaining variables. Variable weights were then created using the standardised coefficients and the model constructed (Wright, Clear & Dickson, 1984).

The Wisconsin Risk assessment has reported reliability and validity (Baird, 1981), and was normed on a Victorian population for Australian use (Ministry of Justice, 1996). It contains eight objective items and three items which require subjective judgement. Offenders scoring up to seven points are classified as low risk, from eight to fourteen moderate, and fifteen or above, as high risk. Table 3 indicates the predictor items included in the Risk assessment.

The Wisconsin Needs assessment has reported predictive validity (Bonta, 1994), and was also normed on a Victorian population (Ministry of Justice, 1996). Interrater reliability has been reported to average over 80% (Baird, 1981). The assessment consists of ten internal and external (to the individual) dynamic items, and one professional judgement item. Offenders scoring from -8 to 14 are classified as low needs, from 15 to 24 moderate, and from 25 upwards as high needs. Table 3 indicates the predictor items included in the Needs assessment.

Table 3

Predictor Items as a function of Victorian Normed Risk and Needs Assessment

Tool	Predictor Items
Risk Assessment	Address changes
	Attitude to offence
	Number of prior orders
	Number of breaches
	Age of first conviction
	Number of prior indictable offences
	Convictions for Burglary, theft, car theft, robbery, worthless cheques, forgery and deception
	Assaultive offence in last two years
	Percentage of time unemployed
	Alcohol use problems
	Other drug use
Needs Assessment	Marital/Family relationships
	Academic/Vocational skills
	Employment
	Financial management
	Companions
	Health
	Mental ability
	Emotional stability
	Alcohol use
	Other drug use
	C.C.O Impression of offender's needs

Procedure

Each of the justice service locations within Western Australia was approached for inclusion in the study. In the regions where approval was given an information sheet was provided to Community Correction Officers who supervised probationers. The sheet outlined the purpose of the study and a standardised protocol for data collection (See Appendix C(i)). A data collection sheet for each participant was completed by either a Community Corrections Officer or the researcher (See Appendix C(ii) for data collection sheet).

The data collection sheet ensured consent forms were sent to the most recent address and the Community Correction Officer's time was only required on one occasion (See Appendix D for consent form).

The data collection sheet was then be held by Community Corrections until consent was withdrawn or data analysis proceeded. If the probationer withdrew from the project, the data collection form was destroyed in front of a staff member from Community Corrections.

Results

Using the Statistical Package for Social Sciences (SPSS) six Discriminant Function analyses (DFA) and one Chi Square analysis was conducted to address the four research questions and one hypothesis.

Data Screening

The data were screened and the assumption of normality evaluated for the entire data set. No data were missing in the 243 cases used for analysis. The assumption of

normality was found to be violated. The marital/family relationships, academic/vocational skills, financial management, companions, and emotional stability variables were transformed to reflect positive values and then transformed to a square root logarithm to correct negative skewness.

Twenty-nine cases were identified as univariate outliers using standard z scores for skewness and kurtosis (range -3 to 3). Twenty cases came from the Non-Aboriginal/non re-offender group and one from the Non-Aboriginal/re-offender group. Five cases came from the Aboriginal/ non re-offender group and three cases from the Aboriginal/ re-offender group. These participants scored unusually high or low on the mental ability, emotional stability and companions items. No multivariate outliers were identified using Mahalanobis Distance (alpha level = .001). Despite transformation of the skewed variables and removal of the outlying cases, the assumption of normality was not met. Therefore the original variables were used and the analysis proceeded on the basis of DFA being robust to violations of normality associated with skewness (Tabachnick & Fidell, 1989).

DFA Assumption Tests and Analysis Strategy

The assumptions of linearity, multicollinearity and singularity and homogeneity of variance-covariance matrices were analysed using within cell scatterplots, Box's M test ($p > .001$), and within-cell correlation matrix and log determinants . As a further safeguard against multicollinearity the tolerance criteria was .001 for inclusion.

Prior to the analysis of each research question the predictor variables were screened for discriminatory utility and high correlation with other variables (Tabachnick & Fidell, 1989). Highly correlated variables were identified using a

pooled within-groups correlation matrix. Poor predictors were found using Wilks' Lambda and univariate F - ratios for univariate difference among group means (Duarte Silva & Stam, 1995). With the exception of the analysis of criminogenic need, the pool of predictor items consisted of the static and dynamic risk items found in the Victorian modified Risk and Need instruments. In the analysis of criminogenic need, the predictor item pool consisted of only the dynamic predictor items found in each scale. For each analysis a list of the screened predictor variables was included in the appropriate appendix. Any deviation from this strategy was indicated.

Risk, Need and Offending Status

A one-way between-subjects direct DFA analysis was conducted using the alcohol use, breaches, employment, offence type and prior order variables as predictors of membership into the two groups. The groups were probationers who had re-offended and probationers who had not re-offended. No violations to the remaining assumptions of DFA were found for the 214 cases (116 re-offenders and 98 non re-offenders). Refer to Appendix E(i) for linearity assumption, E(ii) for predictor variable selection and E(iii) for within analysis assumption tests.

A significant discriminant function was found to separate re-offenders from non re-offenders (Wilks lambda, .88, chi-square 25.589, $df = 6$, $p < .0005$). The centroids for the two groups (non re-offenders = $-.39081$; re-offenders = $.33016$) indicated re-offenders had higher discriminant scores than non re-offenders. The univariate F values and structure coefficients (Table 4) indicated that the best predictor for distinguishing between non re-offenders and re-offenders was offence type. The loading for this variable had the strongest significant correlation with the function. Prior orders, breaches, and age of first conviction all had moderate

significant loadings. Employment and alcohol made significant contributions to the discriminant function, however, the loading with the function was low for both.

As Table 4 depicts, re-offenders scored higher on the offence type, prior orders, age of first conviction and breached orders variables. The mean difference between re-offenders and non re-offenders was not as great for the employment and alcohol variables.

The classification procedure in which sample proportions were used as prior probabilities (non re-offenders = .46; re-offenders = .54) indicated that 78.4% of re-offenders and 51% of non re-offenders were correctly classified. The percentage of grouped cases correctly classified was 65.9% (refer to classification summary in Appendix E (iii) for false positive and negative rates). Despite the adequacy of the classification for re-offenders, the result should be interpreted with caution. The canonical correlation and Wilks' Lambda value indicated a considerable proportion of variance (88.5%) had not been accounted for by the function. This was reflected in the all-groups stacked histogram, which indicated that the discriminant function did not afford a distinct separation between groups (See Appendix E(iii) for all data pertaining to research question one and all-groups histogram).

Table 4

Indicators of Relative Importance of Risk and Need Predictor Variables in
Discriminant Function Analysis Between Non Re-offenders and Re-offenders.

Variable	Structure Coefficient	Univariate F (1, 230)	Non Re-offender		Re-offender	
			<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Offence Type	0.75	15.53	1.53	1.49	2.34	1.52

Prior Orders	0.67	12.26 ****	1.79	2.00	2.72	1.87
Breaches	0.64	11.24 ****	0.82	1.62	1.65	1.97
First Conviction	0.57	8.92 ***	3.16	1.46	3.65	0.92
Employment	0.40	5.57 *	0.84	0.90	1.10	0.93
Alcohol	0.38	4.03 *	1.24	1.49	1.67	1.52
Canonical R	.34					
Eigenvalue	.13					

* $p < .05$ *** $p < .005$ **** $p < .001$ ***** $p < .0005$

Criminogenic Need and Offending Status

A one-way between-subjects direct DFA analysis was conducted using the employment and alcohol variables as predictors of membership into the two groups.

The groups were probationers who had re-offended and probationers who had not re-offended. No violations to the remaining assumptions of DFA were found for the 214 cases (116 re-offenders and 98 non re-offenders). Refer to Appendix E(i) for linearity assumption, F(i) for predictor variable selection and F(ii) for within analysis assumption tests.

A significant discriminant function was found to separate re-offenders from non re-offenders (Wilks lambda, .96, chi-square 7.566, $df = 2$, $p < .05$). The centroids for the two groups (non re-offenders = -.20690; re-offenders = .17479) indicated re-offenders had higher discriminant scores than non re-offenders. The univariate F values, structure coefficients and group means indicated the best predictor for distinguishing between non re-offenders and re-offenders was employment (See Table 5). The loading for this variable had the strongest correlation with the function. Alcohol use also made a significant contribution and had a high correlation with the function.

The classification procedure indicated 61 % of re-offenders and 49 % of non re-offenders were correctly classified (prior probabilities: re-offenders = .54; non re-offenders = .46). The percentage of grouped cases correctly classified was 56 % (refer to classification summary in Appendix F(ii) for false positive and negative rates). The canonical correlation and Wilks' Lambda value indicated 97% of the variance had not been accounted for by the function. The all-groups stacked histogram indicated minimal separation between groups (See Appendix F(ii) for all results and all-groups stacked histogram).

Table 5

Indicators of Relative Importance of Criminogenic Need Predictor Variables in Discriminant Function Analysis between of Non Re-offenders and Re-offenders.

Variable	Structure coefficient	Indicators		
		Univariate F(1,212)	Group Means (SD)	
			non re-offend	re-offend
Employment	.762	4.50*	0.84 (0.90)	1.10 (0.92)
Alcohol	.730	4.12*	1.24 (1.56)	1.67 (1.51)
Eigenvalue	.036			
Canonical R	.188			

*p < .05

Risk, Need, Regional Location and Offending Status

Prior to the analysis of regional probationers the entire set of predictor variables were screened. Drug use was the only predictor which had univariate significance. Therefore, predictors which were found to have high loadings on the derived discriminant function were also included (Duarte Silva & Stam, 1995). See Appendix G (i) for results.

A one-way between-subjects direct DFA was conducted using the drug, first conviction, emotion and address variables as predictors of membership into the two groups. The groups were regional probationers who had re-offended and regional

probationers who had not re-offended. No violations to the assumptions of linearity and homogeneity of variance-covariance matrices were found for the 57 cases (31 re-offend and 26 non re-offend). The assumption of multicollinearity and singularity was found to be violated. The tolerance criteria for multicollinearity was set at .001 (minimum) to control for this violation. Refer to Appendix E(i) for linearity assumption and G(ii) for within analysis assumption tests.

A significant discriminant function was found to separate re-offenders from non re-offenders (Wilks lambda, .78, chi-square 12.557, $df = 4$, $p < .05$). The centroids for the two groups (non re-offenders = -.55458; re-offenders = .46513) suggested re-offenders had higher discriminant scores than non re-offenders. The univariate F-value ($< .05$) and structure coefficient (.680) indicated the best predictor for distinguishing between non re-offenders and re-offenders was drug use. The loading for this variable had the strongest significant correlation with the function. The group means for the drug use (re-offender: $\underline{M} = 0.77$, $\underline{SD} = 0.76$; non re-offender: $\underline{M} = 0.31$, $\underline{SD} = 0.54$) and first conviction (re-offender: $\underline{M} = 3.80$, $\underline{SD} = 0.79$; non re-offender: $\underline{M} = 03.23$, $\underline{SD} = 1.39$) were higher for re-offenders than non-re-offenders. Age of first conviction had a moderate correlation (.510) with the function but had a non significant univariate F-value.

The adequacy of the classification was satisfactory for both re-offenders and non re-offenders. The classification procedure indicated 74 % of re-offenders and 62 % of non re-offenders were correctly classified (prior probabilities: re-offenders = .54; non re-offenders = .46). The percentage of grouped cases correctly classified was 68 % (refer to classification summary in Appendix G(ii) for false positive and negative rates). The canonical correlation indicated 78 % of the variance had not been accounted for by the function . However, the all-groups stacked histogram

provided some separation between groups (See Appendix G(ii) for all-groups stacked histogram and results).

Risk, Need, Metropolitan Location, and Offending Status

A one-way between-subjects DFA was conducted using the alcohol, breaches, company, employment, first conviction, and offence type as predictors of membership into the two groups. The groups were metropolitan probationers who had re-offended (re-offend) and metropolitan probationers who had not re-offended (non re-offend). No violations to the remaining assumptions of DFA were found for the 157 cases (85 re-offend and 72 non re-offend). Refer to Appendix E(i) for linearity assumption H(ii) for all other assumption tests.

A significant discriminant function was found to separate re-offenders from non re-offenders (Wilks lambda, .81, chi-square 31.226, $df = 6$, $p < .0005$). The centroids for the two groups (non re-offenders = $-.51556$; re-offenders = $.43671$) suggested re-offenders had higher discriminant scores than non re-offenders. The univariate F values and structure coefficients (Table 6) indicated offence type was the best predictor for distinguishing between non re-offenders and re-offenders. The loading for this variable had the strongest correlation with the function. Breaches also made a significant contribution and had a high correlation with the function. The alcohol use variable had a moderate significant correlation with the function, while the company, first conviction, and employment variables had weak significant correlations with the function.

The group means (Table 6) for the offence type and breaches variables indicated that metropolitan re-offenders scored higher on these variables than non re-

offenders. The group means also suggested re-offenders had higher scores on the alcohol use variable.

Table 6

Indicators of Relative Importance of Predictor Variables in Discriminant Function

Analysis Between Metropolitan Non Re-offenders and Re-offenders.

Variable	Structure coefficient	Univariate F(1,212)	Group Means (SD)	
			non re-offend	re-offend
Offence Type	.667	15.74*****	1.46 (1.39)	2.35 (1.42)
Breaches	.645	14.73*****	0.61 (1.45)	1.69 (1.99)
Alcohol	.439	6.82**	0.92 (1.42)	1.53 (1.50)
Company	.397	5.57*	0.89 (1.53)	1.48 (1.60)
First Convict	.392	5.42*	3.14 (1.49)	3.60 (0.97)
Employment	.333	3.91*	0.83 (0.90)	1.10 (0.92)
Eigenvalue	.23			
Canonical R	.431			

* $p < .05$ ** $p < .01$ ***** $p < .0005$

The adequacy of the classification was satisfactory for both re-offenders and non re-offenders. The classification procedure indicated 73 % of re-offenders and 65 % of non re-offenders were correctly classified (prior probabilities: re-offenders = .54; non re-offenders = .46). The percentage of grouped cases correctly classified was 69 % (refer to classification summary in Appendix H(ii) for false positive and negative rates). The Wilks' Lambda value indicated a 82 % of the variance had not

been accounted for by the function. However, as the all-groups stacked histogram indicated, the discriminant function provided some separation between groups (See Appendix H(ii) for all-groups stacked histogram and results).

Risk, Need, Aboriginality and Offending Status

Prior to the analysis of Aboriginal probationers the entire set of predictor variables were screened. The offence type variable was the only predictor which had univariate significance. Therefore, predictors which were found to have high loadings on the derived discriminant function were also included (Duarte Silva & Stam, 1995). See Appendix I(i) for results.

A one-way between-subjects DFA was conducted using the offence type and prior offences variables as predictors of membership into the two groups. The groups were Aboriginal probationers who had re-offended and Aboriginal probationers who had not re-offended. No violations to the remaining assumptions of DFA were found for the fifty nine cases (non re-offenders = 23; re-offenders = 36). Refer to Appendix E(i) for linearity assumption and I(ii) for within analysis assumption tests.

A significant discriminant function was found to separate re-offenders from non re-offenders (Wilks lambda, .88, chi-square 6.921, $df = 2$, $p < .05$). The centroids for the two groups (non re-offenders = -.44601; re-offenders = .28495) suggested re-offenders had higher discriminant scores than non re-offenders. The univariate F-values indicated offence type ($p < .05$) was the only predictor which reached univariate significance. The loading for this variable (.91), represented the strongest correlation with the function. The combined result indicated offence type was the primary predictor contributing to the function which differentiated non re-offenders and re-offenders. The group means for the offence type (re-offenders: $M = 2.67$, SD

= 1.33; non re-offenders: $M = 1.86$, $SD = .97$) indicated that Aboriginal re-offenders, on average, scored higher on the offence type variable than non re-offenders.

The classification procedure indicated 97 % of re-offenders and only 13 % of non re-offenders were correctly classified (prior probabilities: re-offenders = .61; non re-offenders = .38). The percentage of grouped cases correctly classified was 64 % (refer to classification summary in Appendix I(ii) for false positive and negative rates). The all-groups stacked histogram indicated poor separation between groups and a large proportion of variance (88 %) had not been accounted for by the function. (See Appendix I(ii) for all-groups stacked histogram and results).

Risk, Need, Non-Aboriginality and Offending Status

A one-way between-subjects DFA was conducted using the alcohol, breaches, company, first conviction, offence type and prior orders variables as predictors of membership into the two groups. The groups were Non-Aboriginal probationers who had re-offended and Non-Aboriginal probationers who had not re-offended. No violations to the remaining assumptions of DFA were found for the 155 cases (80 re-offend and 75 non re-offend). Refer to Appendix E(i) for linearity assumption J(ii) for within analysis assumption tests.

A significant discriminant function was found to separate re-offenders from non re-offenders (Wilks lambda, .87, chi-square 20.917, $df = 6$, $p < .005$). The centroids for the two groups (non re-offenders = -.397; re-offenders = .372) indicated re-offenders had higher discriminant scores than non re-offenders. The univariate F values and structure coefficients (Table 7) indicated that the prior orders, breach and offence type variables were the primary predictors for distinguishing between non re-offenders and re-offenders. The loadings for these variables indicated strong

significant correlations with the function. Age of first conviction had a moderate significant correlation with the function, while the company and alcohol variables had weak significant correlations with the function.

Table 7

Indicators of Relative Importance of Predictor Variables in Discriminant Function

Analysis Between Non Aboriginal Non Re-offenders and Re-offenders.

Variable	Structure coefficient	Univariate F(1,212)	Group Means (SD)	
			non re-offend	re-offend
Prior Orders	.639	9.35***	1.44 (1.93)	2.40 (1.97)
Breaches	.637	9.30***	0.53 (1.37)	1.35 (1.90)
Offence Type	.631	9.10***	1.43 (1.60)	2.20 (1.59)
First Conv	.554	7.03**	2.96(1.55)	3.53 (1.07)
Company	.471	5.08*	0.77 (1.48)	1.33 (1.57)
Alcohol	.416	3.97*	0.91 (1.44)	1.15 (1.48)
Eigenvalue	.150			
Canonical R	.361			

* $p < .05$ ** $p < .01$ *** $p < .005$

The group means (Table 7) for the prior orders and breaches variables indicated that Non-Aboriginal re-offenders had on average scored higher on the prior orders, breach and offence type variables. The difference in group means for company and alcohol was not as great in comparison.

The adequacy of the classification was satisfactory for both re-offenders and non re-offenders. The classification procedure indicated 69 % of re-offenders and 68 %

of non re-offenders were correctly classified (prior probabilities: re-offenders = .516; non re-offenders = .484). The percentage of grouped cases correctly classified was 68 % (refer to classification summary in Appendix J(ii) for false positive and negative rates). The Wilks' Lambda value indicated 87 % of the variance had not been accounted for by the function . However, the all-groups stacked histogram indicated that the discriminant function provided some separation between groups (See Appendix J(ii) for all results).

Risk Level, Intervention and Offending Status

A two-way chi-square analysis was performed on the 198 medium to high-risk re-offenders (110) and non re-offenders (88), comparing across intervention modes. Participants were rated as high to medium risk on the basis of the total score obtained on the Risk Tool. The assumptions of chi-square were deemed to have been met.

A significant relationship was found between intervention mode and offending status, $\chi^2 (3, N = 445) = 138.0, p < .000$. As the frequencies in Table 8 indicated, the proportions of re-offenders and non re-offenders were different for all modes of intervention. The proportion of re-offenders (77.1 %) was higher for the no intervention mode than non re-offenders (22.9 %). While in the specialist intervention mode the proportion of non re-offenders (65.2 %) was higher than non re-offenders (34.8 %). However, as Table 7 suggests, 81.3 % of non re-offenders were recipients of specialist intervention combined with community work and 84.1 % of re-offenders were recipients of community work alone. See Appendix K for results.

Table 8

Frequency of Non Re-offenders and Re-offenders as a Function of InterventionMode

Intervention	<u>Offending Status</u>		Total
	<u>Non Re-offender</u>	<u>Re-offender</u>	
Community Work	11 (15.9 %)	58 (84.1 %)	69
Specialist Intervention	30 (65.2 %)	16 (34.8 %)	46
Community Work and Specialist Intervention	39 (81.3%)	9 (18.8 %)	48
No Intervention	8 (22.9%)	27 (77.1%)	35

Discussion

Risk, Need and Offending Outcome

The first research question, “Do the risk and need items comprising the Victorian-normed Wisconsin Risk and Needs Assessment Tools differentiate male probationers who re-offend from those who do not re-offend in a West Australian population of probationers?” was addressed using DFA analysis. This analysis revealed the best predictor for distinguishing between non re-offenders and re-offenders was offence type. Prior orders, breaches, age of first conviction, employment and alcohol use also made significant contributions to the discriminant function. The common element between the variables was the nature of the predictors. Offence type, breaches, prior orders and age of first conviction all represented static predictors of risk. These predictors had the highest loadings on the function. In contrast, employment and alcohol represented criminogenic needs or dynamic predictors of risk and had the lowest loadings on the function.

The outcome suggested re-offenders were more likely to have had a history of offending involving either burglary, theft, robbery, or offences of deception in comparison to non re-offenders. Re-offenders also scored higher on the number of prior orders and breached orders variables. This finding indicated re-offenders had on average a greater number of prior community correction orders and were less successful in meeting these obligations than non re-offenders. The mean group score for age of first conviction was also higher for re-offenders, which suggested re-offenders were younger than non re-offenders when first convicted of an offence. Despite the minimal contribution made by the employment and alcohol variables to the discriminant function, the outcomes indicated re-offenders experienced longer

periods of unemployment (in the twelve months preceding risk assessment) and had increased levels of alcohol use problems in comparison to non re-offenders.

Criminogenic Need

The analysis of criminogenic need items indicated the best predictor for distinguishing between non re-offenders and re-offenders was employment. Alcohol use also made a significant contribution and like employment had a high correlation with the discriminant function. The group means for these variables indicated re-offenders had on average spent more time unemployed in the twelve months preceding the risk assessment and had higher levels of alcohol use problems than non re-offenders.

The common element between the variables was that both made significant contributions to the discriminant function found in the prior analysis. The combined findings suggested that for the entire sample of probationers, the two criminogenic predictors of risk were more important in distinguishing re-offending behaviour than static predictors which did not contribute to the first discriminant function, or any other dynamic predictor found in the Wisconsin Risk and need tools.

Geographic Location

The DFA result indicated the best predictor for distinguishing between regional non re-offenders and re-offenders was drug use. The group means for drug use indicated re-offenders had experienced higher levels of drug use problems than non re-offenders. Age of first conviction had a moderate correlation with the function but did not make a significant contribution to the discriminant function. However, the result suggested re-offenders on average, were younger when convicted of a first offence.

Overall, the pattern of results should be interpreted with caution as the sample size was small and the assumption of multicollinearity and singularity was violated. Although these limitations must be taken into account, the pattern of results provided a highly interesting outcome. Past research outcomes have generally found static predictors items to be primary non-rehabilitative predictors of risk (Gendreau et al., 1996; Gendreau, Little, Goggin, & Paparozzi, 1996). The present result for the regional population of probationers suggest drug use (a dynamic risk item) was the primary and only significant contributor to the discriminant function. Furthermore, the classification results suggested that the separation of re-offenders from non re-offenders on this basis of the derived function provided a more than adequate classification accuracy rate for both groups.

The DFA analysis of metropolitan probationers indicated offence type was the best predictor for distinguishing between non re-offenders and re-offenders. Breaches also made a significant contribution and had a high correlation with the function, while in comparison, alcohol use had a moderate association with the function. The derived discriminant function provided a separation between groups that exceeded that of the first two research questions and was on par with that of the regional sub-sample.

The group means for the offence type and breaches variables indicated that metropolitan re-offenders had on average a greater number of prior community correction orders and were less successful in meeting these obligations than non re-offenders. The group means also suggested re-offenders had increased levels of alcohol use problems in comparison to non re-offenders. The mean difference between re-offenders and non re-offenders was not as great for the company, first conviction and employment variables. However, the outcomes indicated that re-

offenders on average had less supportive companions (or more dysfunctional friendships), were younger when first contact with the legal system was made and experienced longer periods of unemployment (in the twelve months preceding risk assessment).

The pattern of results for the metropolitan sub-sample reflected outcomes similar to the first and second research questions. The offence type, breaches and first conviction variables had moderate to high correlations with each of the derived functions for both the entire sample and the metropolitan sub-sample. The alcohol and employment variables made significant contributions to the derived functions for the entire sample and the metropolitan sub-sample when included in analyses with static predictors. The company variable, however, was unique to the function derived for the metropolitan sub-sample.

Aboriginality and Non-Aboriginality

The DFA results for the analysis of Aboriginal probationers indicated offence type was the primary predictor contributing to the function which differentiated non re-offenders and re-offenders. The group means for the offence type suggested that Aboriginal re-offenders were on average more likely to have had a history of offending involving either burglary, theft, robbery, or offences of deception in comparison to non re-offenders.

The pattern of results for the Aboriginal sub-sample reflected outcomes similar to the preceding research questions. The offence type variable had moderate to high correlations with each of the derived functions for both the entire sample and the metropolitan sub-sample. The classification procedure indicated that although the classification was highly accurate for re-offenders (97%), only 13 % of non re-

offenders were correctly classified. Despite this limitations, the pattern of results was consistent with the outcomes for the entire sample and the metropolitan sub-sample.

The DFA results for Non-Aboriginal probationers indicated that the prior orders, breach and offence type variables were the primary predictors for distinguishing between non re-offenders and re-offenders. Age of first conviction also had a moderate correlation with the function. The adequacy of the classification was satisfactory for the classification of both re-offenders and non re-offenders and the derived discriminant function provided a separation between groups that exceeded that of the first two research questions.

The group means for the prior orders and breaches variables indicated that Non-Aboriginal re-offenders had on average a greater number of prior community correction orders and were less successful in meeting these obligations than non re-offenders. The group means also suggested re-offenders were on average more likely to have had a history of offending involving either burglary, theft, robbery, or offences of deception in comparison to non re-offenders. The difference in group means for the company and alcohol variables was not as great. However, the outcomes indicated that re-offenders on average had less supportive companions (or more dysfunctional friendships) and greater alcohol use problems.

The pattern of results for the Non-Aboriginal sub-sample reflected outcomes similar to the first and third research questions. The offence type, breaches and first conviction variables had moderate to high correlations with each of the derived functions for both the entire sample and the metropolitan sub-sample. The alcohol use variable made a significant contribution to the derived functions for the entire sample and the metropolitan sub-sample when included in analyses with static

predictors. The company variable also made a significant contribution to the function derived for the metropolitan sub-sample.

Intervention

The hypothesis, "Re-offending and non re-offending status will differ significantly across the conditions of community work alone, specialised interventions alone, community work combined with specialised interventions and no interventions in probationers who have been rated medium to high-risk" was found to be supported. As found in the meta-analytic study conducted by Andrews, Zinger et al., (1990), general correctional service (intervention which could not be labeled as either appropriate or inappropriate in terms of need and responsivity), and general correctional service combined with community work were characterised by higher proportions of non re-offenders.

The greatest difference in proportions of re-offenders and non re-offenders was in the community work alone (84.1 % re-offenders; 15.9 % non re-offenders) and community work combined with specialist intervention (81.3 % non re-offenders; 18.8 % re-offenders) modes. Thus, the present results were supportive of Andrews, Zinger et al. (1990) meta-analytic conclusion that judicial alternatives have little impact on recidivism unless accompanied by some form of rehabilitative service. Furthermore, the finding that a higher proportion of medium to high-risk re-offenders received no intervention and a higher proportion of non re-offenders were recipients of specialist intervention, provided tentative support for the assumption that rehabilitative intervention with medium to high-risk groups is associated with greater reductions in recidivism

Primary predictors

In each of the analyses of the static and dynamic predictors, the metropolitan sub-sample and Non Aboriginal and Aboriginal sub samples, offence type was found to be a primary predictor which contributed to the differentiation between non re-offenders and re-offenders. This finding was concordant with Morgan's (1995) review of static predictors of probation recidivism. Property, burglary and theft offences were cited as offences with the highest re-arrest rate and the most accurate variables associated with predicting probation failure. In the Non-Aboriginal sub-sample the number of prior orders variable also proved to be a primary predictor of recidivism. This finding was consistent with previous studies of Western Australian, South Australian and Tennessee offenders (Broadhurst & Maller, 1990; Roeger, 1994; Morgan, 1995). Thus, as other researchers have found, it would appear that as the number of prior orders increases, so does the probability of re-offending behaviour. Overall, the present research findings were consistent with interpretations of research outcomes which have suggested static factors, while providing no intervention utility, increase predictive accuracy (Gendreau, Little et al., 1996).

The outcome from the analysis of criminogenic need suggested that employment was the primary predictor for the entire sample which differentiated between re-offenders and non re-offenders. This was consistent with Broadhurst and Maller's (1990) research outcome where the recidivism probabilities for both Aboriginals and non Aboriginals who were employed at arrest were lower and the likelihood of a successful outcome for parole was higher if employed upon release. Morgan (1995) found in a study of 266 male and female probationers that inadequate employment was major source of variation in successful probation completion. Moreover, the findings that offence type and employment were primary predictors of recidivism

outcome provide support for Morgan's (1995) research finding that probationers who were unemployed were more likely to be characterised by, and have subsequent convictions for burglary, robbery and theft while on probation.

The primary predictor of recidivism in the regional sub-sample was drug use. This finding, as mentioned previously, was not expected considering the analysis included static predictors of risk. This finding provided support for the importance of assessing risk of recidivism on the basis of population-specific attributes. While further research would be necessary to validate and explain this finding, the geographic location of the sub-group may provide some insight into this population-specific trend and the factors (such as increased drug availability and involvement) which may have contributed.

Factors Mediating Recidivism Outcome

The present research findings provided tentative support for the assertion made by many researchers that re-offending outcome differs as a function of race, geography and rehabilitative conditions (Clear & Gallagher, 1985; Andrews, Bonta et al., 1990; Clear, 1995; Brown, 1996; Quinsey, 1995). Drug use was found to be a primary predictor for the regional sub-sample, while in the Metropolitan sub-sample offence type and number of breaches proved to be the primary predictors of risk. The analysis of race revealed that although both groups shared offence type as a primary predictor, only one item from the entire pool of predictors reached univariate significance in the analysis of the Aboriginal group. While this outcome may have been attributable to the research design, it could also be speculated that the set of predictors did not contain items which were relevant to the offending behaviour of Aboriginal people.

The analysis of rehabilitative conditions indicated that probationers with the same risk classification were found to have different outcomes as a function of rehabilitative conditions undertaken. Primarily, higher frequencies of re-offending outcome were observed in the 'no intervention' and 'community work alone' categories. Despite the tentative nature of the finding, the outcome suggested that probation outcome in medium-to-high-risk groups can be influenced by the absence or provision of appropriate intervention.

Adequacy of the Classification

Discussion of classification accuracy is warranted for both statistical and ethical purposes. From a statistical perspective the classification procedures for each of the derived discriminant functions provided an indication of how well the set of predictors differentiated between re-offenders and non re-offenders. The false negative and positive rates which can be yielded from the classification procedure provided context for the miss-classification rate. The ramifications of miss-classification rates are generally found in the ethical issues of public safety and the civil rights of offenders.

The classification rates resulting from the analyses of static and dynamic predictors, criminogenic predictors alone, and Aboriginality indicated that 78.4%, 61.2 % and 97.2 % re-offenders (respectively) were correctly classified. The grouped cases classification rates of 65.89% (static and dynamic predictors), 55.61% (criminogenic needs) and 64.41% (Aboriginality) indicated a moderate accuracy rate for each analysis. While these findings appeared satisfactory for the prediction of re-offending behaviour, the false positive and false-negative rates were more indicative of the functional implications. In the re-offender groups, 21.6% (static and dynamic

predictors), 38.8% (criminogenic needs) and 2.8%(Aboriginality), were predicted to be non re-offenders on the basis of the derived function. In the non re-offender groups, 49%, 51% and 87% respectively, were predicted to be re-offenders. Thus, while the accuracy of the classification was relatively high for re-offenders, the classification accuracy for non re-offenders proved to be only marginally better, or in the case of the two latter analyses, worse than a chance prediction that the entire sample would not re-offend.

The converse was found for the analyses of regional, metropolitan and Non-Aboriginal probationers. The adequacy of the classification was satisfactory for the classification of both re-offenders and non re-offenders. The classification procedure indicated 74 % of regional, 73 % of metropolitan and 69 % of Non-Aboriginal re-offenders were correctly classified. Similar results were found for non re-offenders, with 62 % of regional, 65 % of metropolitan and 68 % of Non-Aboriginal cases correctly classified. Thus, although the false positive rate was the most elevated in each of the sub-samples of geographic location (regional = 38%; metropolitan = 35%), these rates were far more satisfactory than those found for the analyses of the entire sample as function of risk and need combined, criminogenic need alone and the Aboriginal sub-sample. Furthermore, these rates were proportional to past criminological studies which have utilized DFA for the purpose of prediction (Klassen & O'Connor, 1988). Thus, for the present study the classification rates suggested the analyses of regional, metropolitan and Non-Aboriginal probationers produced the most accurate differentiation between non re-offenders and re-offenders. From an applied perspective these results also provided adequate false positive and negative rates.

Limitations

Measures and research design

An important limitation relating to the generalisability of the present findings concerns the research design. The criterion was dichotomous and did not account for those who may have re-offended and were not caught, less serious or less persistent re-offending behaviour, or the quality of legal assistance. However, the present research sought to identify factors which differentiated those who had been convicted of a new offence to provide directions for the development of a instrument not only focused on measuring, but also reducing risk. While the quality of legal assistance and unreported re-offending behaviour may prove to be difficult confounds to overcome, several authors have offered directions for criterion which account for changes in the nature of re-offending behaviour. As Gottfredson (1987) and Jones (1993) have suggested, such bias could be tempered by the adoption of a continuous criterion which qualifies change in offending behaviour.

The second design issue concerned the use of risk and needs assessments which had been completed in several different regions by community correction officers with varying backgrounds and experience. While adequate inter-rater reliability has been reported for the Wisconsin tools, this cannot be assumed in the Western Australian setting and thus must be considered as a potential confound to the present results. However, the use of a standardised format for data collection was considered far superior than the use of file notes which may have been incomplete, outdated or based on self-report.

The final design limitation related to the composition of the participant sample, most notably, Aboriginal probationers were under-represented and the

burglary/robbery and damage/steal offence categories were over-represented. There were two possible explanations for these outcomes. The first, represents a sample bias caused by a non-random sample where participants could not be matched on characteristics. While this was certainly a problem in the present research, the second explanation was as plausible. Morgan (1995) has reported property offences such as burglary, robbery, theft and stealing have proven to be the offence categories which best characterize probationer offending behaviour. Therefore, the over-representation could also be explained in terms of a naturally occurring trend in probation populations. In regard to the under-representation of Aboriginal probationers, Australian researchers such as Roeger (1994) have reported that Aboriginal persons are more likely to receive a custodial sentence than Non-Aboriginals and therefore are over-represented in this justice system.

Predictor variables

Variables in each of the final analyses generally displayed moderate to strong correlations with each of the derived functions. Poor explanatory power, however, was observed for most of the models derived from the analyses. Based on the outcomes of previous prediction studies this present finding was both expected and concordant. Poor explanatory power is not uncommon (Klassen and O'Connor, 1988) and provides evidence for the importance of examining the classification accuracy. However, while classification accuracy is a central goal of prediction, final models should have both explanatory power and high classification accuracy in order to provide a model which best 'fits' the population of interest.

Although the discussion of isolated variables has demonstrated variation in outcome across race and geographical difference, such a practice is prone to overly

simplified conclusions and potentially incorrect interpretation. However, the goal of the present research was to uncover possible associations and trends which mediate recidivism outcome. A point of reference in the present study was the finding that within the State of Western Australia differences in outcome were apparent across race and geography. While the result was somewhat tentative, ignoring that such a trend maybe inherent in the population has serious ethical implications associated with the use of biased instruments for decision making.

Cross validation

The equations derived for the present data set are particular to this data and thus the accuracy of the equation may be overestimated. Therefore it is unknown if the coefficients derived for the sample can be generalised to a new sample. Shrinkage of r^2 would be expected in a cross-validation procedure and based on the outcomes of previous research such decline would be notable (Klassen & O'Connor, 1988; Tabachnick & Fidell, 1989). However, a lack of cross-validation in prediction studies has not been uncommon due to the large sample size needed and the nature of the research goal (Klassen & O'Connor, 1988). In the case of the present study, the importance of the analyses related to exploring the feasibility of static and dynamic predictor items found in the Wisconsin tools to assess the probability of re-offending in the Western Australian population.

Implications of the Findings

The Assumption of Homogeneity

While the sample size, varying classification accuracy for groups, and intent of the present study was prohibitive of reaching conclusions relating to the validity of

the Wisconsin tools for the Western Australian sample, the present results provide tentative support for the conclusion drawn by Wright et al. (1984). In the Western Australian population a large number of items were not predictive of outcome, more notably for the regional and Aboriginal sub-groups. Variables such as mental ability, assaultive offences, attitude to offence, marital/family relationships, academic/vocation skills, financial management, health, and emotional stability were not predictive of re-offending behaviour in the sample. Factors such as the sample size, sample composition and variation in ratings across community corrections officers could have contributed to the outcome. However, the finding was also consistent with Wright et al.'s. (1984) conclusion that the population may be so different from the Wisconsin population that the model is not generalisable. Moreover, as Wright et al. (1984) observed, while the items from the Wisconsin tools produced a fair classification rate, the overall explanatory power was poor.

The present research findings provide support for past research findings which suggest offenders cannot be classified on the assumption of homogeneity (Clear & Gallagher, 1985; Andrews, Bonta et al., 1990; Clear, 1995; Brown, 1996; Quinsey, 1995). While static predictors appear to be reliable predictors across groups, the present findings and past outcomes suggest weighting these predictors on the basis of population-specific attributes may increase the validity and reliability of tools (Wright et al., 1984). A principal example from the present study was the finding that the offence type was a primary predictor for the present sample and assaultive offences were not predictive of outcome. Within the Wisconsin population 'assaultive offences' was given the highest weighting on the basis of corrections policy regarding violent offences in Wisconsin.

The criminogenic needs items were the area of greatest disparity in the present study. The finding that employment was a primary criminogenic need predictor was consistent with past research outcomes in Australian populations. The analyses employed as a function of race and geography revealed differences across the sub-samples. In the regional area drug use was the primary predictor across both static and dynamic predictors. In the metropolitan and non Aboriginal sub-samples, the outcomes indicated that re-offenders had less supportive companions and greater alcohol use problems. Thus, the present research outcome and past research outcomes, suggest that the predictors most likely to influence the generalisability of existing tools (not only across groups, but also within groups) are predictors based on criminogenic needs (Fowler, 1993; Bonta, Pang & Wallace-Capretta, 1995).

Overall, the present results have reinforced the need to either validate existing tools or more appropriately, construct prediction tools on the basis of factors which mediate re-offending outcome both *across* and *within* groups. The results also highlighted the potential to reduce the risk of re-offending behaviour on the basis of criminogenic need and provided further support for past research findings which have suggested dynamic predictors are a valuable and necessary component of risk prediction.

Intervention and Reducing Recidivism

The functional significance of the results found for intervention in the present study related to the parsimonious allocation of resources and successful reductions in recidivism. The combined results suggested a judicial alternative (shown to have little utility when used alone) has the potential to be applied with a rehabilitative purpose that has measurable outcomes. The results from the present study suggested

that 'community work combined with specialist interventions' was associated with higher frequencies of medium to high-risk offenders who did not re-offend. It was also found that employment was the criminogenic need which provided the greatest differentiation between re-offenders and non re-offenders.

The logical extension of these results would be to combine community work with appropriate interventions in an effort to address the employment issues of high-risk offenders. Savings in human and financial resources would be gained by reductions in offenders eligible for community work due to the selection of high-risk cases and focus on rehabilitation needs. Moreover, one of Gendreau's (1996) six fundamental findings relating to interventions which reduced recidivism would be emulated. As Gendreau (1996) has stated;

Program structure and activities reached out into the offenders real-world social network and disrupted the delinquency network by placing offenders in situations ... where prosocial activities predominated (p 149).

The success of this approach, however, would be reliant on a cooperative effort between the judicial system (the point at which orders and conditions are determined) and Community Based Corrections (the point at which assessment and intervention are undertaken). The potential for a unified rehabilitative environment in Western Australia is conceivable if Community Based Corrections and the judicial system can be brought together as cognate systems. The results of the present study have demonstrated that positive results have already been achieved, and it can only be hoped that this finding will foster a more formalised interchange between systems.

Directions for Future Research

Further studies of Western Australian offenders are needed to discover the extent to which factors such as race, geography, and rehabilitative conditions mediate re-offending behaviour. Furthermore, studies into the little explored area of female re-offending behaviour will be necessary to establish if gender differences found in other Western Countries extend to the Western Australian population. In addition, the results from the present analysis of Aboriginality provided tentative suggestion that instruments may be culture-specific and thus investigation of indicators which provide a more full explanation are warranted.

Conclusions

While the present research findings cannot be considered conclusive, they have served to demonstrate the limitations of transferring tools designed for one population to another. The importance of identifying predictors of risk which are population-specific remain central to the accurate and ethical assignment of risk level and rehabilitation efforts. The results have also highlighted the potential of the risk, need and responsivity principles to facilitate measurable, cost effective methods of risk reduction. Furthermore, when combined with court imposed conditions that have been generally viewed as punitive, provide promising directions for a new generation of rehabilitation based alternatives.

Identification of factors which mediate re-offending outcome and facilitate rehabilitation is central to maintaining community safety, ensuring intervention is appropriate and the classification of offenders is unbiased. Australian correctional services must acknowledge the geographic, demographic and ethnic diversity of the offending population to meet these goals. Risk and Need instruments must be

constructed for the Australian offender population and intervention attempts must acknowledge the unique criminogenic needs which increase the risk of re-offending behaviour. Put simply, if re-offending behaviour has diverse causes, it will take diverse solutions to amend the 'revolving door' characteristic of corrections.

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Appendix A(i)

Offence Categories in Table 1

Traffic and Drink Drive

The traffic (9); drink drive (1); traffic and drink drive (10); traffic and fail to report or stop an accident (1); traffic and breach of order; and traffic and resisting arrest (1) categories were combined as traffic offences.

Damage/Steal

The damage (including criminal)/steal (28); damage/steal and breach (3); and damage/steal and forge/utter/deception (5); and damage and traffic (2); disorderly, resist arrest and breach (1) categories were combined as damage offences.

Assault

The assault (23); unlawful wounding (4); assault and damage (3); assault and disorderly (2); assault and breach (2); assault and wilful exposure (1); assault and forge/utter/deception (1); and assault damage and breach (1) categories were combined as assault offences.

Drug

The drug (14); drug and traffic (1) and drug, damage and breach (1) categories were combined as drug offences.

Burglary/Robbery

The burglary/robbery (36); burglary/robbery and damage (13); burglary/robbery and traffic (4); and burglary/robbery and assault (3) categories were combined as burglary/robbery offences.

Armed/Threat to Kill/Kidnap

The armed, threat to kill and kidnap (7); armed, assault and breach (2); and armed, damage and breach (1) categories were combined as armed/threat/kidnap offences.

Appendix A (ii)
Table 1A

Distribution of Specific Intervention Types as a Function of Race and Region

Intervention Type	<u>Regional</u>		<u>Metropolitan</u>		Total
	Aboriginal	Non Aboriginal	Aboriginal	Non Aboriginal	
Psychological and Psychiatric	2	3	3	4	12
Substance use	5	4	2	12	23
Sex Offender Prog	0	2	0	7	9
Sex Offender Prog and Psychological	0	0	0	1	1
Substance and Psychological	2	1	0	3	6
Anger Manage and Psychological	0	0	0	2	2
C/Work and Anger Management	1	0	1	1	3
C/Work and Substance	0	2	6	16	24
C/Work and Psychological/Psych	1	3	1	9	14
C/Work, Sex Prog and Psychological	1	0	0	2	3
C/Work, Substance, and Psychological	1	0	0	1	2
Community Work	8	5	14	48	75
No Intervention	6	10	5	19	40
Total	27	30	32	125	214

Appendix B (i)

RISK ASSESSMENT

NAME: _____

Select the appropriate answer and enter the associated weight in the score column. Total all scores to arrive at the risk assessment score.

						SCORE
1. Number of changes of address in last twelve months (prior to imprisonment for Parolees)	None	0	One	2	Two or more	3

2. Attitude to Offence	Motivated to change:	0	Unwilling to accept responsibility	3	Not motivated to change	5

3. Number of prior Community Corrections Orders: (Adult or Children's Court)	None	0	One or more	4		

4. Number of Breaches of Community Corrections Orders: (Adult or Children's Court)	None	0	One or more	4		

5. Age at first conviction (Adult or Children's Court)	24 or older	0	20 to 23	2	19 or younger	4

6. Number of prior indictable offence (Adult or Children's Court)	None	0	One	2	Two or more	4

7. Convictions (Adult/Child) for following offence types; select and add for score. Do not exceed a total of 5. Include current offence.	Burglary, Theft,				Worthless cheques/	
	Car Theft, Robbery	2			forgery/deception	3

8. Assaultive offence in the last two years.	Mandatory 15		0 - 15			
	GBH, Abduction		Other Assaultive			
	Armed Robbery		Offences, please justify score.			
	Murder/Manslaughter					
	Sexual Offences - Force/Intimidation					
<hr/>						
9. Percentage of time employed in the last twelve months: (Prior to imprisonment for Parolees)	60% + or N/A	0	40% - 59%	1	Under 40%	2

10. Alcohol use problems (Prior to and during imprisonment for Parolees)	No problem	0	Occasional abuse	2	Frequent abuse	4

11. Other drug use (Prior to and during imprisonment for Parolees)	No problem	0	Occasional abuse	1	Frequent abuse	2

 RISK SCALE: Low Risk 0 - 7 Moderate Risk 8 - 14 High Risk 15+						
Any further comments/decisions to override etc.						TOTAL

Appendix B (ii)

NEEDS ASSESSMENT

NAME: _____

Select the appropriate answer and enter the associated weight in the score column. Total all scores to arrive at the needs assessment score.

							SCORE	
A. Marital/Family Relationships								
Exceptionally strong	-1	Relatively stable	0	Some dysfunction	3	Major dysfunction	5	_____
							REFER Y	
							N	
B. Academic/Vocational Skills								
High	-1	Adequate	0	Low	2	Minimal	4	_____
							REFER Y	
							N	
C. Employment								
Satisfactory/one year +	-1	Secure employment home duties/student pensioner	0	Unsatisfactory employment/or unemployed adequate job skills	3	Unemployed needs training	6	_____
							REFER Y	
							N	
D. Financial Management								
Excellent	-1	No difficulties	0	Minor difficulties	3	Severe difficulties	6	_____
							REFER Y	
							N	
E. Companions								
Good support	-1	No adverse relationships	0	Some dysfunction	3	Negative	4	_____
							REFER Y	
							N	
F. Health								
Sound	0	Disability/illness self managed	1			Serious disability/chronic illness;	2	_____
							REFER Y	
							N	
G. Mental Ability								
		Needs some assistance/mild intellectual disability	3			Severely limited significant intellectual impairment	6	_____
Good	0							REFER Y
							N	
H. Emotional Stability								
Well adjusted	-2	Appropriate emotional responses	0	Emotional instability/psychiatric disorder	4	Emotional/psychiatric disorder interferes with functioning	7	_____
							REFER Y	
							N	
I. Alcohol Use								
No problem	0	Occasional abuse	3			Frequent abuse	6	_____
							REFER Y	
							N	
J. Other Drug Use								
No problem	0	Occasional abuse	3			Frequent abuse	5	_____
							REFER Y	
							N	
K. C.C.O.'s Impression Of Offender's Needs								
Minimum	-1	Low	0	Medium	3	Maximum	5	_____
Needs Scale								
Low	-8 - 14	Mod	15 - 24	High	25+			TOTAL _____

Appendix C (i)

Community Correction Officer Information Sheet

Risk Assessment Predictors: Can Probationers Who Re-offend Be Identified?**CCO INFORMATION SHEET**

Dear CCO,

I am an Honours Psychology Student at Edith Cowan University Joondalup. The research project *Risk Assessment Predictors: Can Probationers Who Re-offend Be Identified?* is being conducted as the Thesis component of my Honours course. My interest in this area stemmed from my past work as a CCO and interest in risk/needs assessment.

I am aware that your time is limited, but hope you will participate in this research by completing the attached data collection sheets. The results will hopefully add to the development of the Ministry Actuarial Model, and provide summary information on probationers who re-offend in your region.

The research has approval from the Ministry and gained ethical clearance from the University Ethical Committee. Should you have concerns about the release of information a copy of the Ministry approval can be provided. Withdrawal of consent forms will also be sent to each probationer meeting the research criteria for inclusion.

A data collection sheet has been provided for completion to ensure consent forms are sent to the most recent address and your time is only required on one occasion. The data collection sheet serves two purposes. The first pertains to the collection of research data. Should the probationer meet all the criteria the withdrawal of consent form will be sent to the listed address. The data collection sheet will then be held by Community Corrections in Bunbury until data analysis proceeds. Should the probationer decide to withdraw from the project, his data will be removed and shredded in front of a staff member from the Bunbury Office. The second purpose is to eliminate participants that do not meet the research criteria. In this event the data collection form will be shredded in front of a staff member from the Bunbury Office.

At **no time** will any information that could identify a probationer be removed from Community Corrections in Bunbury. The data base will be structured so that each person has a code name. A master sheet that links code names to real names will be held at Community Corrections in Bunbury. This will ensure that data can be removed if a person decides to withdraw after the data base has been constructed. The master sheet will be the property of the Ministry.

Should you have concerns or questions you can reach me at Community Corrections, Bunbury on (08) 97220 424. If you would like to speak with my University Supervisor, you can contact Associate Professor Steve Baldwin at the Edith Cowan Psychology Department on (08) 97807 754.

Kind Regards

Deborah Dawson.

Appendix C (ii)

Data Collection Sheet

Risk Assessment Predictors: Can Probationers Who Re-offend Be Identified?

DATA COLLECTION SHEET

Offenders Name

Reporting Office.....

Last Known Address.....

Data Code/Subnum (Researcher to complete).....

[Data Code/SubnumRegion Number.....Researcher to complete these items]

Please note that only males will be included in the research, so please do not proceed if the offender is female.**1) Does this person have completed risk and need assessment forms on file?**1. Yes ☐2. No ☐ (If no, please stop here and return

form)

2) How long has this person been on the current probation order? (If less than 6 months, stop here and return form)

Please state length of time in months and then tick appropriate box months

1. 6 - 12 mths ☐2. 13 - 18 mths ☐

3. 19 mths and over

☐**3) What is this person's age? Years (Please state age in years and then tick appropriate box)**1) 17 - 21 ☐2) 22 - 26 ☐3) 27 - 31 ☐4) 32 - 36 ☐5) 37 - 41 ☐6) 41 → ☐**4) Is this person:**1. Aboriginal ☐2. Non Aboriginal ☐**5) Current Offence/s:** 1) Traffic ☐ 2) Drink Drive ☐ 3) Forge/Utter/Decep ☐4) Drug Offences ☐ 5) Breach of order ☐ 6) Damage (inc crim)/Steal ☐7) Assault (inc harm) ☐ 8) Sex Offence ☐ 9) Burg/Rob (unarmed) ☐10) Armed/Threat to kill/Kidnap ☐ 11) Other ☐ (describe)

6) Has this person been found guilty of an offence (except non compliance) during the current probation order?

A) No ☐ B) Yes ☐ (Indicate time spent on order prior to guilty finding by ticking box below)

1. 1day - 6 mths ☐ 2. 7 - 12mths ☐ 3. 13 - 18 mths ☐ 4 19 mths and over ☐

7) Please indicate the Interventions that have been undertaken or are in progress .

(If Yes was the answer to Que 6, only indicate what was undertaken or in progress prior to the new offence)

1. Community Work ☐ 2. Urinalysis ☐ 3. Anger Counselling ☐ 4. Sex Offender Counselling/Programme ☐ 5. Psychological/Psychiatric ☐ 6. Substance Use ☐
7. None ☐ 8. Other ☐.....describe

8) Please insert score as per the risk and needs assessments held on file (please do not use re-assessments).

RISK ASSESSMENT SCORES

1____ 7____
2____ 8____
3____ 9____
4____ 10____
5____ 11____
6____

TOTAL RISK SCORE_____

NEEDS ASSESSMENT SCORES

A____ G____
B____ H____
C____ I____
D____ J____
E____ K____
F____

TOTAL NEED SCORE_____

Appendix D**Consent Form****CONSENT FORM****Predictors of Risk Assessment: Can probationers who Re-Offend be Identified?**

Dear Participant,

I am conducting a project on probationers as part of my Honours Thesis in Psychology at Edith Cowan University. The purpose of the study is to investigate risk factors related to offending behaviour. If you agree to take part in the study I would like to use information from your client file. You will not have to do anything other than give your permission.

You do not have to take part in the study. If you agree to participate you can withdraw at any time. There will be no positive or negative consequences related to your probation order. Your name or information that could identify you will not appear in the study. If the research appears in publications, it will not contain information that would identify you.

I believe the research will help identify risk factors and intervention needs related to the risk of re-offending. If you would like to find out the results of the study, please write to me requesting an information sheet.

If you do not wish to participate in the study you can contact me at the phone number or address below my name. Alternately, you can send the enclosed form that withdraws your consent. The address and fax number are at the bottom of the form. If you do not contact me, I will include your data in the project.

Should you have any questions about the project you can contact me, or my University supervisor at the address below.

Yours sincerely,

Deborah Dawson
Community Corrections
65 Wittenoon Street
Bunbury, 6230
Phone 097 220 424
Fax 097 911 404

Associate Professor Steve Baldwin
Department of Psychology
Edith Cowan University
097 807 754

WITHDRAWAL OF CONSENT FORM

Predictors of Risk Assessment: Can probationers who Re-Offend be Identified?

I have read the information regarding the research project proposed by Deborah Dawson from Edith Cowan University. I do not give permission to be a participant in this project.

Name.....

Signature.....

Date.....

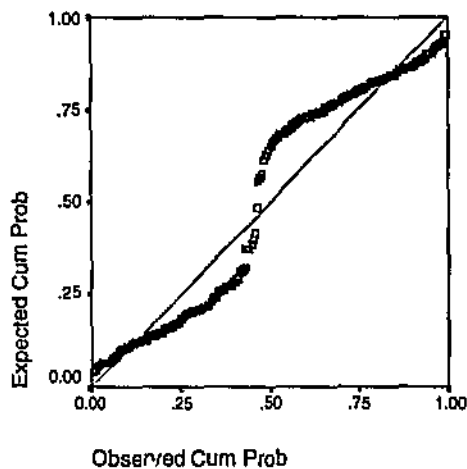
Please return your form to the address or fax number below
Deborah Dawson
Community Corrections
65 Wittenoon Street
Bunbury, 6230

Phone 097 220 424
Fax 097 911 404

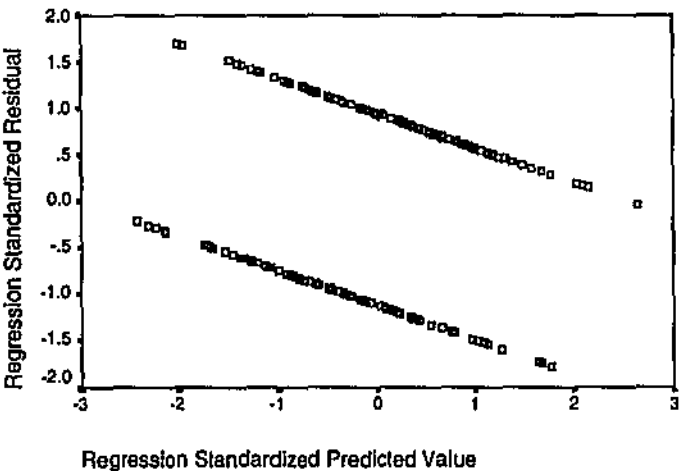
Appendix E (i)

Linearity Assumptions Tests with all Variables in the Analysis

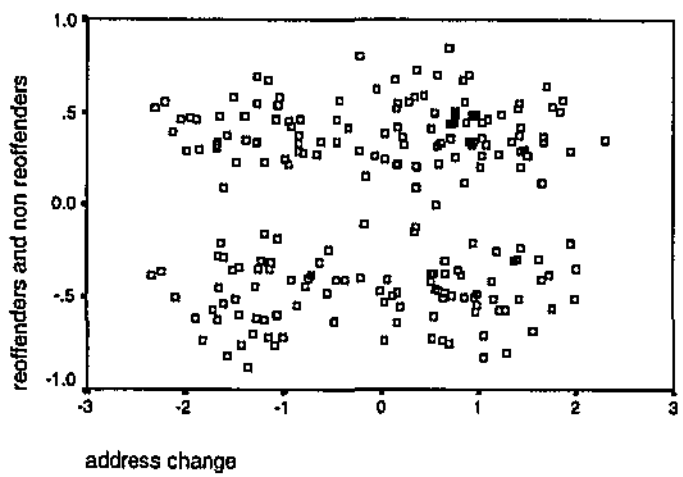
Normal P-P Plot of Regression Standardized Residuals
Dependent Variable: reoffenders and non-reoffenders



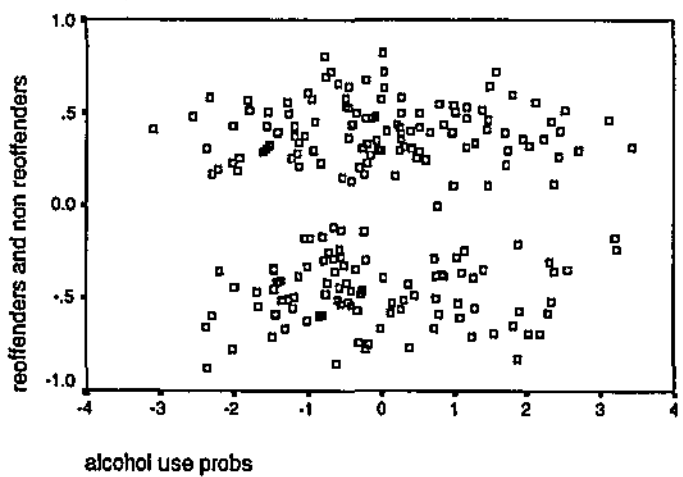
Scatterplot
Dependent Variable: reoffenders and non-reoffenders



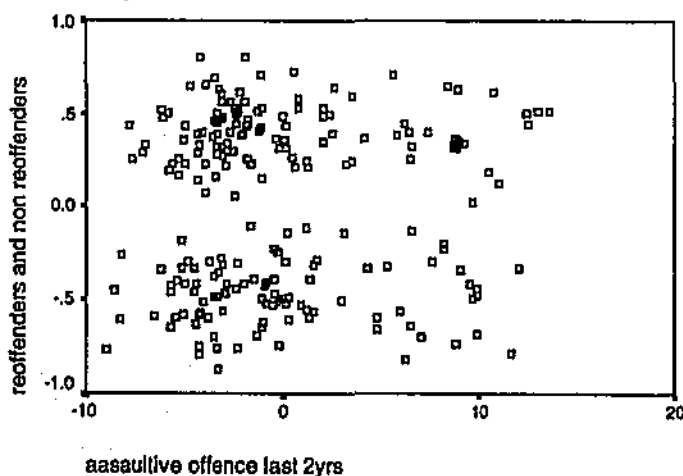
Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



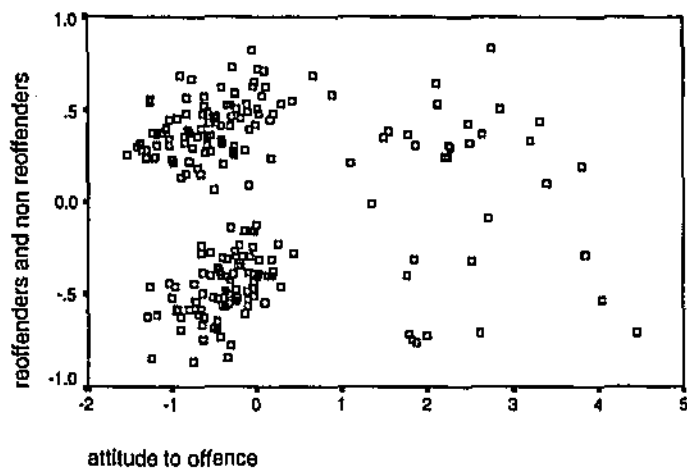
Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



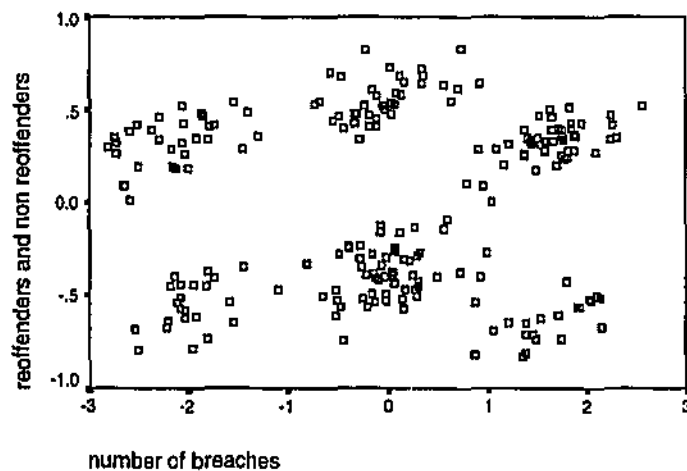
Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



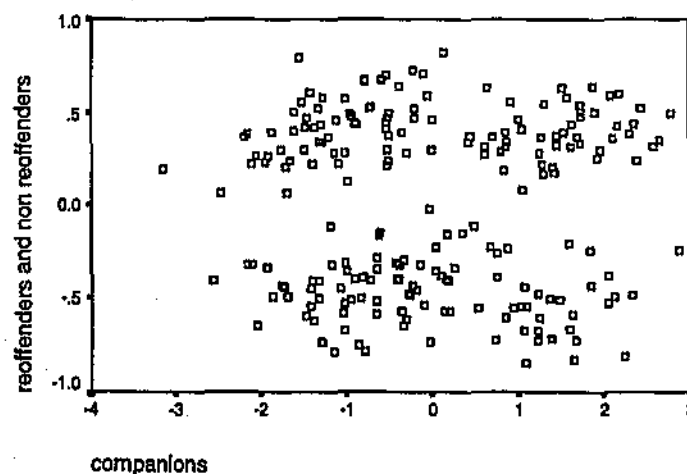
Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders

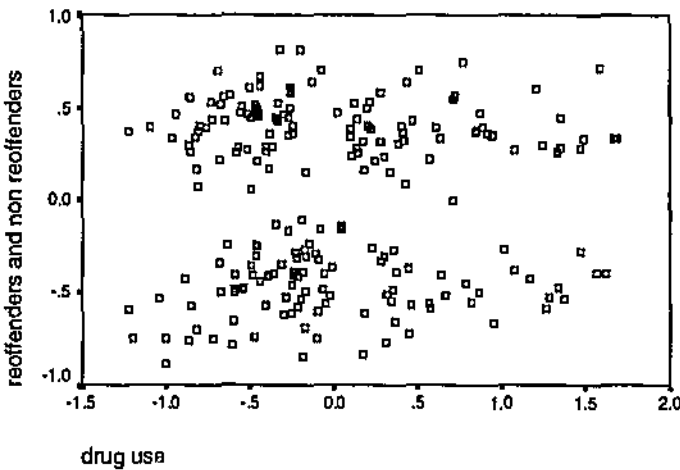


Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



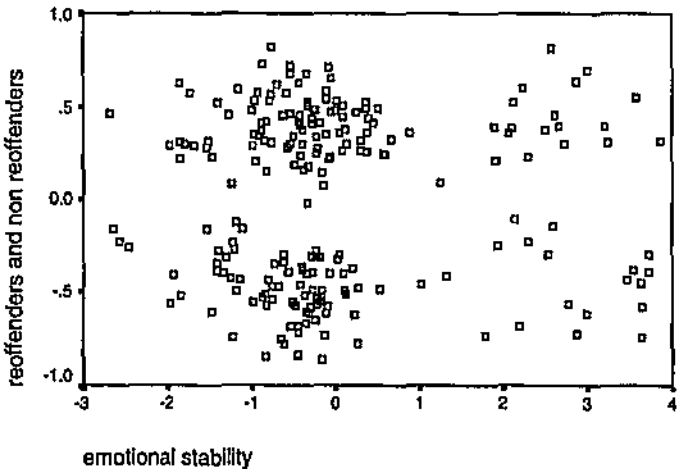
Partial Regression Plot

Dependent Variable: reoffenders and non reol



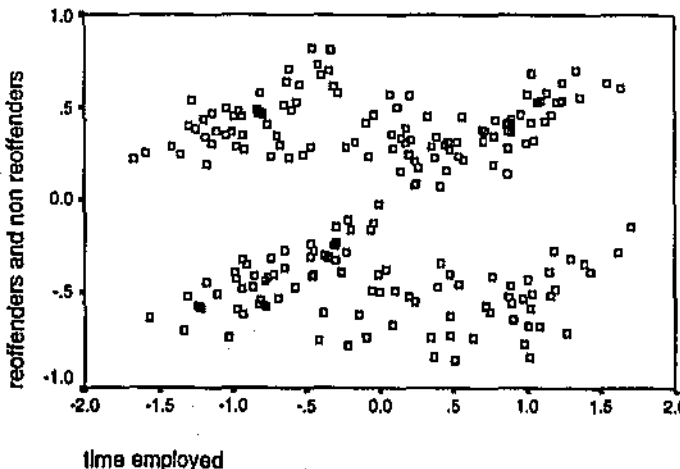
Partial Regression Plot

Dependent Variable: reoffenders and non reol

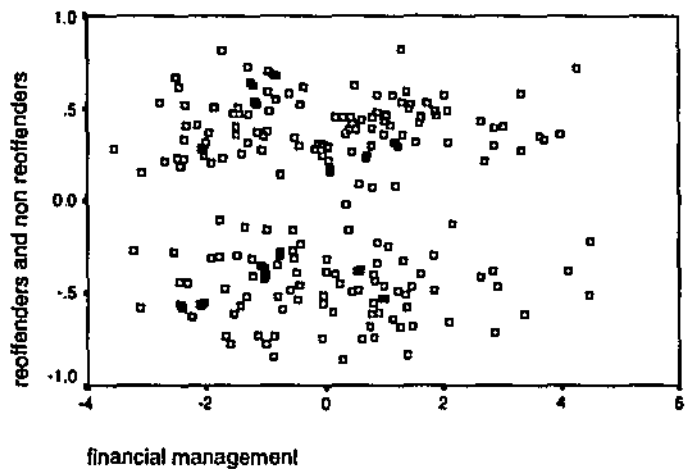


Partial Regression Plot

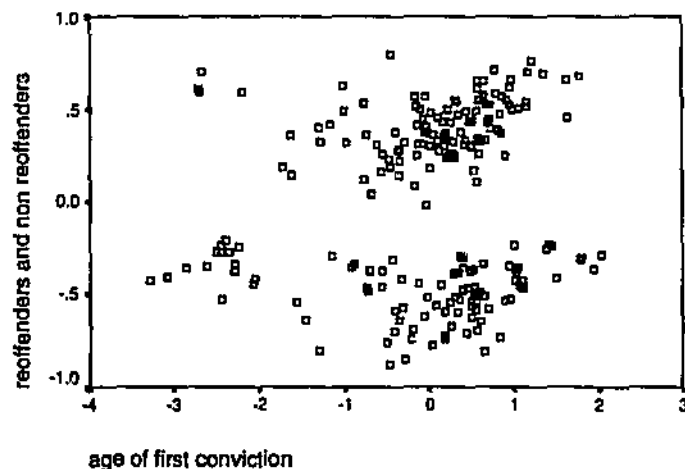
Dependent Variable: reoffenders and non reol



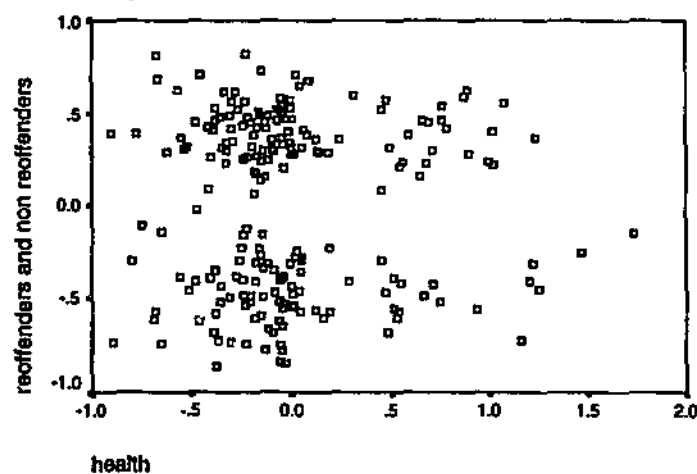
Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders

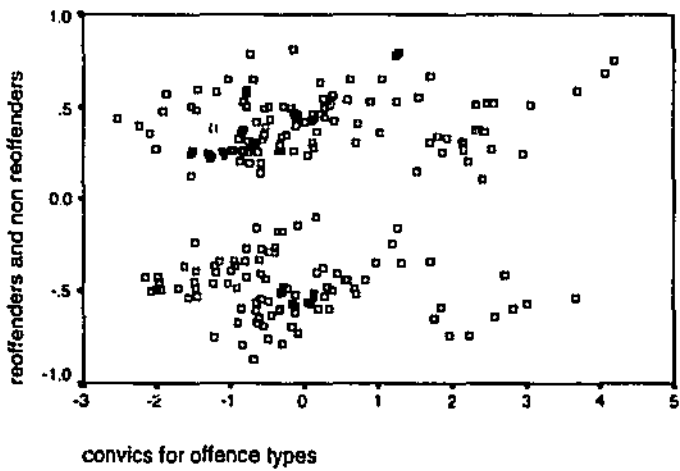


Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



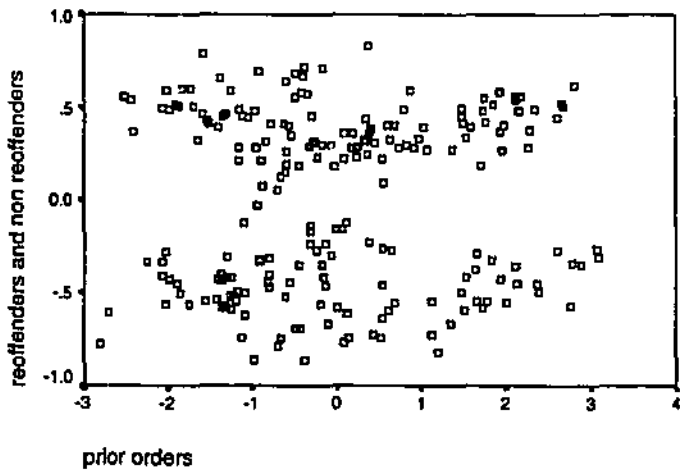
Partial Regression Plot

Dependent Variable: reoffenders and non reoffenders



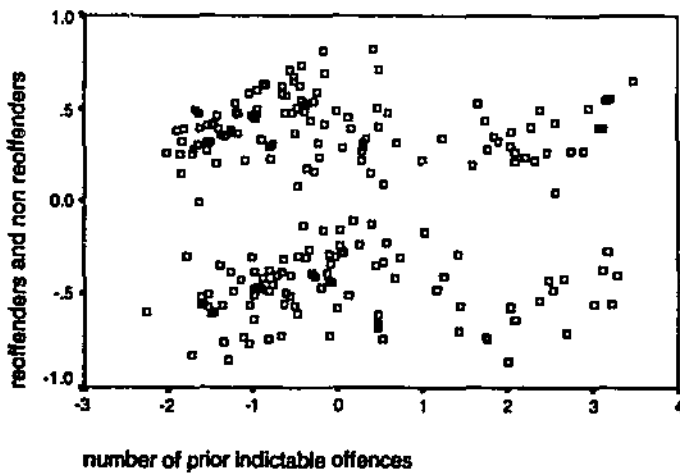
Partial Regression Plot

Dependent Variable: reoffenders and non reoffenders

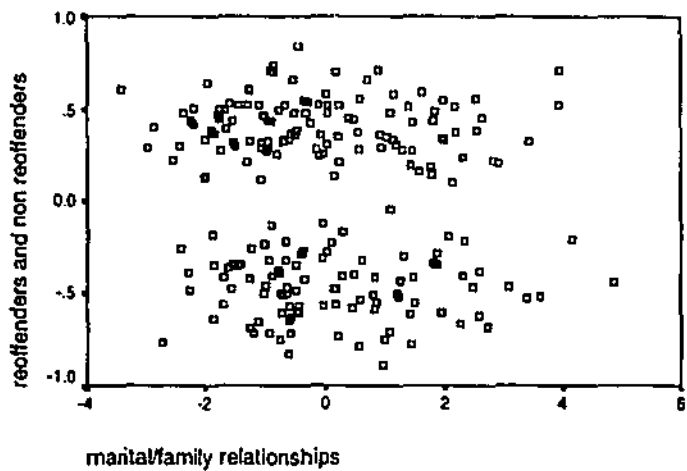


Partial Regression Plot

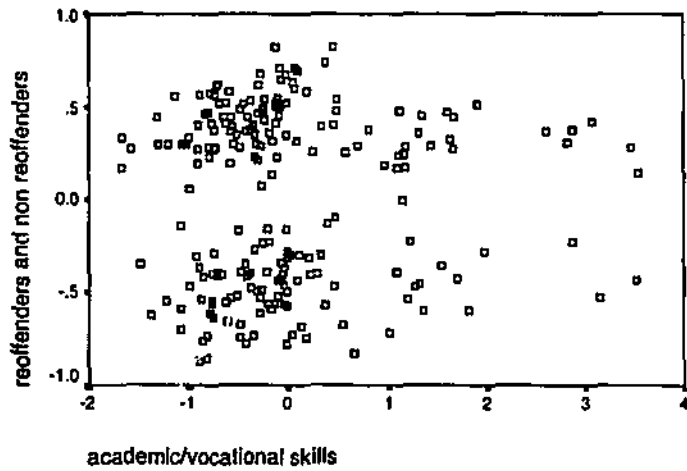
Dependent Variable: reoffenders and non reoffenders



Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



Partial Regression Plot
Dependent Variable: reoffenders and non reoffenders



Appendix E (ii)

Risk, Need and Offending Status: Preliminary Analysis

Predictors

The predictor variables were change of address (address); attitude to offence (attitude); number of prior orders (priorord); number of breaches (breaches); age of first conviction (firstcon); number of prior indictable offence (prioroff); convictions for offences types (offentyp); assaultive offences in last two years (assault); time employed in last twelve months (employ) alcohol use problems (alcohol); drug use (drug); marital/family relationships (relation); academic/vocation skills (skills); financial management (finances); companions (company); health (health); mental ability (ability); and emotional stability (emotion).

Pooled within-groups correlation matrix

	BREACHES	EMPLOY	FIRSTCON	OFFENTYP	ABILITY	ADDRESS
BREACHES	1.00000					
EMPLOY	.13884	1.00000				
FIRSTCON	.14898	.15751	1.00000			
OFFENTYP	.21191	.20967	.22780	1.00000		
ABILITY	1.00000	
ADDRESS	-.00626	.21315	.02539	.05975	.	1.00000
ALCOHOL	.19429	.11345	.16628	.07830	.	-.08684
ASSAULT	.07287	-.08478	-.16673	-.12604	.	-.04986
ATTITUDE	.08669	.10452	.02028	.04176	.	.05805
COMPANY	.07939	.13289	.19652	.11873	.	.03087
DRUG	.03315	.24600	.10505	.23277	.	.08307
EMOTION	-.03423	-.00177	-.14967	-.03642	.	.01800
FINANCES	.06321	.15282	.02052	.10150	.	.19391
HEALTH	-.09231	.04028	-.10322	.04062	.	.04142
PRIORD	.56416	.21322	.30961	.35297	.	-.04989
PRIOROFF	.16623	.00882	.23626	.18965	.	-.02961
RELATION	-.03773	.03412	.12982	.02656	.	.24001
SKILLS	.13721	.14790	.09905	-.04743	.	.10167

	ALCOHOL	ASSAULT	ATTITUDE	COMPANY	DRUG	EMOTION
ALCOHOL	1.00000					
ASSAULT	.18409	1.00000				
ATTITUDE	.13327	.05440	1.00000			
COMPANY	.28734	-.05872	.12918	1.00000		
DRUG	.08411	-.08513	.22760	.21042	1.00000	
EMOTION	-.02912	.15482	.10428	.11441	.00429	1.00000
FINANCES	.05533	-.22402	.09004	.15634	.19702	.04659
HEALTH	.13624	.11836	.08099	.06780	-.04347	.36196
PRIORD	.23606	.04423	.15708	.07326	.08968	.03873
PRIOROFF	.04989	.03534	-.11536	.12060	.13502	.04798
RELATION	.21289	.14233	.04455	.25287	-.04335	.19949
SKILLS	.13630	.06206	.01518	.25925	-.01798	-.10488
	FINANCES	HEALTH	PRIORD	PRIOROFF	RELATION	SKILLS
FINANCES	1.00000					
HEALTH	.19522	1.00000				
PRIORD	.06625	-.00193	1.00000			
PRIOROFF	-.04437	-.04217	.29996	1.00000		
RELATION	.20362	.22357	.13257	.11053	1.00000	
SKILLS	.12078	.06671	.10420	.08107	.10215	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 212 degrees of freedom

Variable	Wilks' Lambda	F	Significance
BREACHES	.94964	11.2420	.0009
EMPLOY	.97923	4.4970	.0351
FIRSTCON	.95964	8.9172	.0032
OFFENTYP	.93173	15.5341	.0001
ABILITY is a constant.			
ADDRESS	.99394	1.2927	.2568
ALCOHOL	.98094	4.1193	.0436
ASSAULT	.99991	.0189	.8908
ATTITUDE	.99344	1.3992	.2382
COMPANY	.98751	2.6809	.1030
DRUG	.98228	3.8253	.0518
EMOTION	.99882	.2515	.6166
FINANCES	.99754	.5236	.4701
HEALTH	.99996	.0085	.9267
PRIORD	.94531	12.2654	.0006
PRIOROFF	.99427	1.2219	.2703
RELATION	.99923	.1631	.6868
SKILLS	.99322	1.4462	.2305

The following variable failed the tolerance test.

Variable	Within Groups Variance	Tolerance	Minimum Tolerance
ABILITY	.000000	.0000000	.0000000

Appendix E (iii)

Risk, Need and Offending Status: Discriminant Analysis

Group means

RECID	ALCOHOL	EMPLOY	BREACHES	FIRSTCON
1	1.24490	.83673	.81633	3.16327
2	1.67241	1.10345	1.65517	3.65517
Total	1.47664	.98131	1.27103	3.42991

RECID	OFFENTYP	PRIORD	PRIOROFF
1	1.53061	1.79592	.89796
2	2.34483	2.72414	1.13793
Total	1.97196	2.29907	1.02804

Group standard deviations

RECID	ALCOHOL	EMPLOY	BREACHES	FIRSTCON
1	1.56021	.90467	1.62040	1.46220
2	1.51385	.92670	1.97860	.92411
Total	1.54644	.92418	1.86678	1.22273

RECID	OFFENTYP	PRIORD	PRIOROFF
1	1.48674	1.99979	1.52295
2	1.52146	1.87239	1.63067
Total	1.55620	1.98215	1.58311

Pooled within-groups correlation matrix

	BREACHES	EMPLOY	FIRSTCON	OFFENTYP	ALCOHOL	PRIORD
BREACHES	1.00000					
EMPLOY	.13884	1.00000				
FIRSTCON	.14898	.15751	1.00000			
OFFENTYP	.21191	.20967	.22780	1.00000		
ALCOHOL	.19429	.11345	.16628	.07830	1.00000	
PRIORD	.56416	.21322	.30961	.35297	.23606	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 212 degrees of freedom

Variable	Wilks' Lambda	F	Significance
BREACHES	.94964	11.2420	.0009
EMPLOY	.97923	4.4970	.0351
FIRSTCON	.95964	8.9172	.0032
OFFENTYP	.93173	15.5341	.0001
ALCOHOL	.98094	4.1193	.0436
PRIORD	.94531	12.2654	.0006

Analysis number 1

Direct method: all variables passing the tolerance test are entered.

Minimum tolerance level..... .00100

Canonical Discriminant Functions

Maximum number of functions..... 1
Minimum cumulative percent of variance... 100.00
Maximum significance of Wilks' Lambda.... 1.0000

Prior probabilities

Group	Prior	Label
1	.45794	non re-offender
2	.54206	re-offender
Total	1.00000	

Classification function coefficients (Fisher's linear discriminant functions)

RECID	=	1 non re-offen	2 re-offender
BREACHES		-.0391728	.1055299
EMPLOY		.4749188	.5946408
FIRSTCON		2.0500527	2.2354106
OFFENTYP		.2586363	.5069624
ALCOHOL		.2351349	.3200682
PRIORD		-.0556790	-.0160283
(Constant)		-4.5004384	-5.9533854

Canonical Discriminant Functions

Fcn	Eigenvalue	Pct of Variance	Cum Pct	Canonical Corr	After Fcn	Wilks' Lambda	Chi-square	df	Sig
1*	.1302	100.00	100.00	.3395	: 0	.884762	25.589	6	.0003

Standardized canonical discriminant function coefficients

	Func 1
BREACHES	.36598
EMPLOY	.15222
FIRSTCON	.30867
OFFENTYP	.51860
ALCOHOL	.18086
PRIORD	.10624

Structure matrix:

Pooled within-groups correlations between discriminating variables and canonical discriminant functions (Variables ordered by size of correlation within function)

	Func 1
OFFENTYP	.75005
PRIORD	.66648
BREACHES	.63807
FIRSTCON	.56828
EMPLOY	.40356
ALCOHOL	.38624

Canonical discriminant functions evaluated at group means (group centroids)

Group	Func 1
1	-.39081
2	.33016

Test of Equality of Group Covariance Matrices Using Box's M

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Group Label	Rank	Log Determinant
1 non re-offender	6	3.643800
2 re-offender	6	3.194070
Pooled within-groups covariance matrix	6	3.596148

Box's M	Approximate F	Degrees of freedom	Significance
41.61665	1.92148	21,	155808.5 .0067

Appendix F (i)

Criminogenic Need and Offending Status: Preliminary Analysis

Predictor Variables

The criminogenic need variables included in the analysis were time employed in last twelve months (employ); alcohol use problems (alcohol); drug use (drug); marital/family relationships (relation); academic/vocation skills (skills); financial management (finances); companions (company); health (health); mental ability (ability); and emotional stability (emotion).

Pooled within-groups correlation matrix

	ABILITY	ALCOHOL	COMPANY	DRUG
ABILITY	.0000			
ALCOHOL	.0000	2.3570		
COMPANY	.0000	.6985	2.5075	
DRUG	.0000	.0988	.2549	.5854
EMOTION	.0000	-.0726	.2942	5.3285953E-03
EMPLOY	.0000	.1597	.1929	.1725
FINANCES	.0000	.1620	.4720	.2874
HEALTH	.0000	.1107	.0568	-.0176
RELATION	.0000	.6082	.7451	-.0617
SKILLS	.0000	.2260	.4434	-.0149
	EMOTION	EMPLOY	FINANCES	HEALTH
EMOTION	2.6366			
EMPLOY	-2.6290282E-03	.8403		
FINANCES	.1442	.2671	3.6354	
HEALTH	.3110	.0195	.1969	.2799
RELATION	.6028	.0582	.7225	.2201
SKILLS	-.1840	.1464	.2487	.0381
	RELATION	SKILLS		
RELATION	3.4628			
SKILLS	.2053	1.1667		

	ABILITY	ALCOHOL	COMPANY	DRUG	EMOTION	EMPLOY
ABILITY	.					
ALCOHOL	.	1.00000				
COMPANY	.	.28734	1.00000			
DRUG	.	.08411	.21042	1.00000		
EMOTION	.	-.02912	.11441	.00429	1.00000	
EMPLOY	.	.11345	.13289	.24600	-.00177	1.00000
FINANCES	.	.05533	.15634	.19702	.04659	.15282
HEALTH	.	.13624	.06780	-.04347	.36196	.04028
RELATION	.	.21289	.25287	-.04335	.19949	.03412
SKILLS	.	.13630	.25925	-.01798	-.10488	.14790
		FINANCES	HEALTH	RELATION	SKILLS	
FINANCES	1.00000					
HEALTH	.19522	1.00000				
RELATION	.20362	.22357	1.00000			
SKILLS	.12078	.06671	.10215	1.00000		

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 212 degrees of freedom

Variable	Wilks' Lambda	F	Significance
ABILITY is a constant.			
ALCOHOL	.98094	4.1193	.0436
COMPANY	.98751	2.6809	.1030
DRUG	.98228	3.8253	.0518
EMOTION	.99882	.2515	.6166
EMPLOY	.97923	4.4970	.0351
FINANCES	.99754	.5236	.4701
HEALTH	.99996	.0085	.9267
RELATION	.99923	.1631	.6868
SKILLS	.99322	1.4462	.2305

Appendix F (ii)

Criminogenic Need and Offending Status: Discriminant Analysis

Group means

RECID	EMPLOY	ALCOHOL
1	.83673	1.24490
2	1.10345	1.67241
Total	.98131	1.47664

Group standard deviations

RECID	EMPLOY	ALCOHOL
1	.90467	1.56021
2	.92670	1.51385
Total	.92418	1.54644

Pooled within-groups covariance matrix with 212 degrees of freedom

	EMPLOY	ALCOHOL
EMPLOY	.8403	
ALCOHOL	.1597	2.3570

Pooled within-groups correlation matrix

	EMPLOY	ALCOHOL
EMPLOY	1.00000	
ALCOHOL	.11345	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 212 degrees of freedom

Variable	Wilks' Lambda	F	Significance
EMPLOY	.97923	4.4970	.0351
ALCOHOL	.98094	4.1193	.0436

Analysis number 1

Direct method: all variables passing the tolerance test are entered.

Minimum tolerance level..... .00100
Canonical Discriminant Functions

Maximum number of functions..... 1
Minimum cumulative percent of variance... 100.00
Maximum significance of Wilks' Lambda.... 1.0000

Prior probabilities

Group	Prior	Label
1	.45794	non re-offender
2	.54206	re-offender
Total	1.00000	

Classification function coefficients (Fisher's linear discriminant functions)

RECID	=	1 non re-offen der	2 re-offender
EMPLOY		.9070579	1.1936804
ALCOHOL		.4667341	.6287024
(Constant)		-1.4510102	-1.7966934

Canonical Discriminant Functions

Fcn	Eigenvalue	Pct of Variance	Cum Pct	Canonical Corr	After Fcn	Wilks' Lambda	Chi-square	df	Sig
1*	.0365	100.00	100.00	.1877	: 0	.964780	7.566	2	.0228

* Marks the 1 canonical discriminant functions remaining in the analysis.

Standardized canonical discriminant function coefficients

	Func 1
EMPLOY	.68836
ALCOHOL	.65146

Structure matrix

Pooled within-groups correlations between discriminating variables and canonical discriminant functions (Variables ordered by size of correlation within function)

Func	1
EMPLOY	.76227
ALCOHOL	.72956

Unstandardized canonical discriminant function coefficients

	Func	1
EMPLOY	.7509226	
ALCOHOL	.4243409	
(Constant)	-1.3634835	

Canonical discriminant functions evaluated at group means (group centroids)

Group	Func	1
1	-.20690	
2	.17479	

Test of Equality of Group Covariance Matrices Using Box's M

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Group Label	Rank	Log Determinant	
1 non re-offender	2	.678885	
2 re-offender	2	.661684	
Pooled within-groups covariance matrix	2	.670434	
Box's M	Approximate F	Degrees of freedom	Significance
.18651	.06153	3, 94608740.0	.9800

Classification results

Actual Group		No. of Cases	Predicted Group Membership	
			1	2
-----		-----	-----	-----
Group 1	non re-offender	98	48 49.0%	50 51.0%
Group 2	re-offender	116	45 38.8%	71 61.2%

Percent of "grouped" cases correctly classified: 55.61%

Appendix G (i)

Risk, Need, Regional Location and Offending Status: Preliminary Analysis

Predictor Variables

The predictor variables were change of address (address), attitude to offence (attitude), number of prior orders (priorord); number of breaches (breaches); age of first conviction (firstcon); number of prior indictable offence (prioroff); convictions for offences types (offentyp); assaultive offences in last two years (assault); time employed in last twelve months (employ) alcohol use problems (alcohol); drug use (drug); marital/family relationships (relation); academic/vocation skills (skills); financial management (finances); companions (company); health (health); mental ability (ability); and emotional stability (emotion).

Pooled within-groups correlation matrix

	ABILITY	ADDRESS	ALCOHOL	ASSAULT	ATTITUDE	BREACHES
ABILITY	.					
ADDRESS	.	1.00000				
ALCOHOL	.	-.08386	1.00000			
ASSAULT	.	.02349	.00920	1.00000		
ATTITUDE	.	.09338	.30749	.29573	1.00000	
BREACHES	.	-.03645	.33203	.12636	.14403	1.00000
COMPANY	.	-.02066	.36675	-.27895	-.05250	.16014
DRUG	.	-.03986	.19605	.06809	.31984	.21677
EMOTION	.	-.04143	-.00728	.13246	.05498	-.18187
EMPLOY	.	.09936	.41248	.03824	.25889	.17363
FINANCES	.	.13297	.30008	-.29865	.07344	-.11477
FIRSTCON	.	-.17632	.29188	-.01480	.14413	.30938
HEALTH	.	.29456	.12938	.01006	.22800	-.17529
PRIORD	.	-.02691	.39287	.11426	.15468	.56047
PRIOROFF	.	-.13590	-.01444	.06796	-.10617	.28036
RELATION	.	.18495	.41186	-.09172	-.06127	.09254
SKILLS	.	.05049	.19075	.02903	.02314	-.03758
OFFENTYP	.	.00202	.22923	-.00219	.21002	.30505

	COMPANY	DRUG	EMOTION	EMPLOY	FINANCES	FIRSTCON
COMPANY	1.00000					
DRUG	.15927	1.00000				
EMOTION	.17311	-.07632	1.00000			
EMPLOY	.12159	.18329	-.17190	1.00000		
FINANCES	.28471	.24628	.13113	.03909	1.00000	
FIRSTCON	.16630	.21445	-.26129	.28881	.02377	1.00000
HEALTH	.14913	-.01350	.49408	.03493	.22571	-.02305
PRIORD	.16951	.32394	-.24347	.38518	-.04893	.48669
PRIOROFF	.28723	.18773	-.04769	-.03847	-.08659	.18840
RELATION	.50029	.03349	.31134	.12508	.28628	.02912
SKILLS	.44222	-.03381	-.02854	.35155	-.09749	.12057
OFFENTYP	.19048	.57119	-.18478	.41053	.22556	.26515

	HEALTH	PRIORD	PRIOROFF	RELATION	SKILLS	OFFENTYP
HEALTH	1.00000					
PRIORD	-.03974	1.00000				
PRIOROFF	-.11381	.35123	1.00000			
RELATION	.14336	.11452	-.09074	1.00000		
SKILLS	.18657	.19645	.13554	.29173	1.00000	
OFFENTYP	.07819	.47801	.15984	-.00383	.03601	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 55 degrees of freedom

Variable	Wilks' Lambda	F	Significance
-----	-----	-----	-----
ABILITY is a constant.			
ADDRESS	.94678	3.0914	.0843
ALCOHOL	.99914	.0473	.8287
ASSAULT	.99817	.1008	.7520
ATTITUDE	.97055	1.6691	.2018
BREACHES	.99821	.0985	.7549
COMPANY	.99102	.4985	.4832
DRUG	.89024	6.7814	.0118
EMOTION	.94197	3.3880	.0711
EMPLOY	.98750	.6963	.4076
FINANCES	.99936	.0351	.8520
FIRSTCON	.93504	3.8210	.0557
HEALTH	.98612	.7741	.3828
PRIORD	.99581	.2315	.6323
PRIOROFF	.99446	.3064	.5821
RELATION	.97145	1.6162	.2090
SKILLS	1.00000	.0001	.9932
OFFENTYP	.97199	1.5847	.2134

Structure matrix:

Pooled within-groups correlations between discriminating variables
and canonical discriminant functions
(Variables ordered by size of correlation within function)

	Func 1
DRUG	.54534
FIRSTCON	.40935
EMOTION	-.38546
ADDRESS	.36820
ATTITUDE	.27055
RELATION	-.26623
OFFENTYP	.26362
HEALTH	-.18425
EMPLOY	.17475
COMPANY	-.14785
PRIOROFF	-.11592
PRIORD	.10076
ASSAULT	.06650
BREACHES	.06571
ALCOHOL	-.04554
FINANCES	-.03925
SKILLS	.00179

Appendix G (ii)

Risk, Need, Regional Location and Offending Status: Discriminant Analysis

Group means

RECID	ADDRESS	DRUG	EMOTION	FIRSTCON
1	.96154	.30769	1.07692	3.23077
2	1.54839	.77419	.32258	3.80645
Total	1.28070	.56140	.66667	3.54386

Group standard deviations

RECID	ADDRESS	DRUG	EMOTION	FIRSTCON
1	1.28002	.54913	1.80938	1.39449
2	1.23393	.76200	1.27507	.79244
Total	1.27831	.70755	1.57359	1.13500

Pooled within-groups covariance matrix with 55 degrees of freedom

	ADDRESS	DRUG	EMOTION	FIRSTCON
ADDRESS	1.5753			
DRUG	-.0337	.4538		
EMOTION	-.0801	-.0792	2.3749	
FIRSTCON	-.2451	.1600	-.4459	1.2264

Pooled within-groups correlation matrix

	ADDRESS	DRUG	EMOTION	FIRSTCON
ADDRESS	1.00000			
DRUG	-.03986	1.00000		
EMOTION	-.04143	-.07632	1.00000	
FIRSTCON	-.17632	.21445	-.26129	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 55 degrees of freedom

Variable	Wilks' Lambda	F	Significance
ADDRESS	.94678	3.0914	.0843
DRUG	.89024	6.7814	.0118
EMOTION	.94197	3.3880	.0711
FIRSTCON	.93504	3.8210	.0557

Analysis number 1

Direct method: all variables passing the tolerance test are entered.

Minimum tolerance level..... .00100

Canonical Discriminant Functions

Maximum number of functions..... 1
 Minimum cumulative percent of variance... 100.00
 Maximum significance of Wilks' Lambda.... 1.0000

Prior probabilities

Group	Prior	Label
1	.45614	non re-offender
2	.54386	re-offender
Total	1.00000	

Classification function coefficients

(Fisher's linear discriminant functions)

RECID	=	1 non re-offen der	2 re-offender
ADDRESS		1.1753094	1.6135426
DRUG		-.2042675	.6916827
EMOTION		1.1054971	.9012296
FIRSTCON		3.2977246	3.6635451
(Constant)		-7.2409428	-9.2439197

Canonical Discriminant Functions

Fcn	Eigenvalue	Pct of Variance	Cum Pct	Canonical Corr	After Fcn	Wilks' Lambda	Chi-square	df	Sig
1*	.2673	100.00	100.00	.4593	:	0.789057	12.557	4	.0137

* Marks the 1 canonical discriminant functions remaining in the analysis.

Standardized canonical discriminant function coefficients

	Func 1
ADDRESS	.53939
DRUG	.59187
EMOTION	-.30871
FIRSTCON	.39729

Structure matrix

Pooled within-groups correlations between discriminating variables and canonical discriminant functions (Variables ordered by size of correlation within function)

	Func 1
DRUG	.67913
FIRSTCON	.50978
EMOTION	-.48003
ADDRESS	.45853

Canonical discriminant functions evaluated at group means (group centroids)

Group	Func 1
1	-.55458
2	.46513

Test of Equality of Group Covariance Matrices Using Box's M

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Group Label	Rank	Log Determinant	
1 non re-offender	4	.872120	
2 re-offender	4	-.204131	
Pooled within-groups covariance matrix	4	.574976	
Box's M	Approximate F	Degrees of freedom	Significance
15.94459	1.46723	10,	13443.6 .1446

Classification results

Actual Group		No. of Cases	Predicted Group Membership	
			1	2
-----		-----	-----	-----
Group 1	non re-offender	26	16 61.5%	10 38.5%
Group 2	re-offender	31	8 25.8%	23 74.2%

Percent of "grouped" cases correctly classified: 68.42%

All-Groups Stacked Histogram

Symbols used in plots

Symbol	Group	Label
1	1	non re-offender
2	2	re-offender

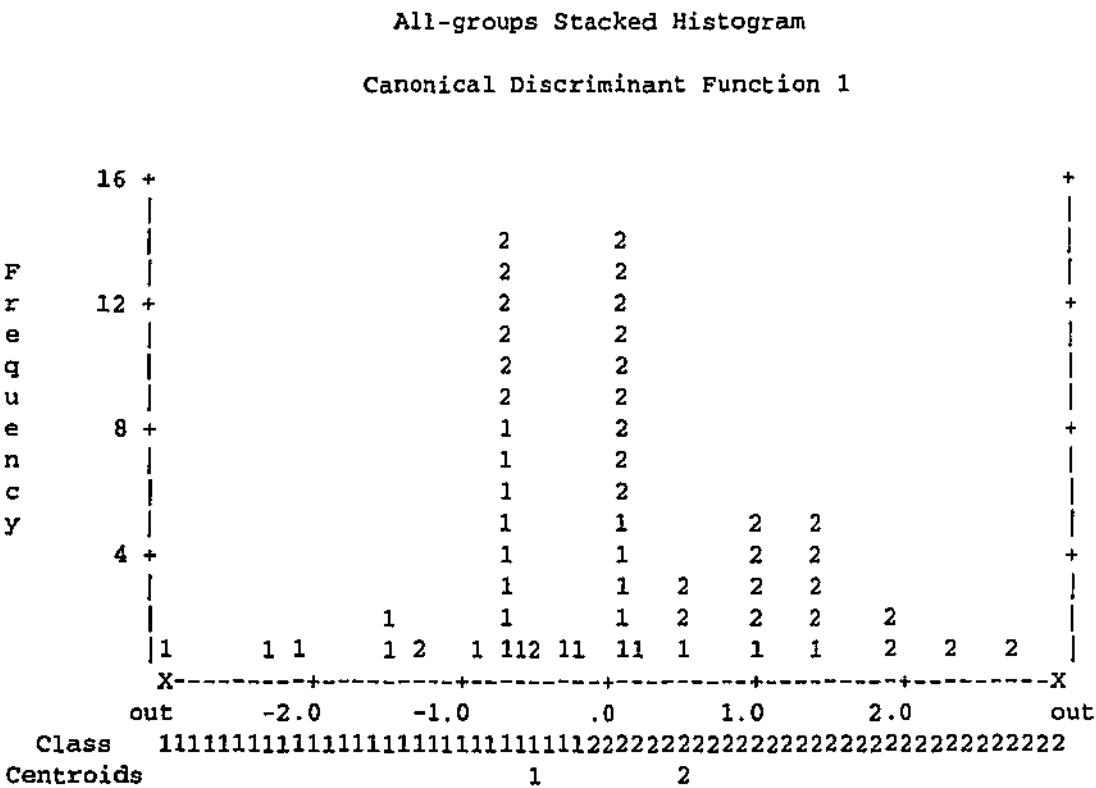


Figure G3. All-groups stacked histogram displaying separation of groups by the discriminant function, based on the selected risk and need predictor variable scores.

Appendix H (i)

Risk, Need, Metropolitan Location, and Offending Status: Preliminary Analysis

Predictor Variables

The predictor variables were change of address (address), attitude to offence (attitude), number of prior orders (priord); number of breaches (breaches); age of first conviction (firstcon); number of prior indictable offence (prioroff); convictions for offences types (offentyp); assaultive offences in last two years (assault); time employed in last twelve months (employ) alcohol use: problems (alcohol); drug use (drug); marital/family relationships (relation); academic/vocation skills (skills); financial management (finances); companions (company); health (health); mental ability (ability); and emotional stability (emotion).

Pooled within-groups correlation matrix

	ABILITY	ADDRESS	ALCOHOL	ASSAULT	ATTITUDE	BREACHES
ABILITY	.					
ADDRESS	.	1.00000				
ALCOHOL	.	-.03788	1.00000			
ASSAULT	.	-.05135	.20725	1.00000		
ATTITUDE	.	.04326	.07178	-.05543	1.00000	
BREACHES	.	.03089	.10855	.03660	.07119	1.00000
COMPANY	.	.06951	.24851	.02719	.20925	.02665
DRUG	.	.10146	.08474	-.13241	.19581	-.00748
FINANCES	.	.21391	-.01158	-.19294	.10123	.12326
FIRSTCON	.	.09503	.11693	-.24342	-.02445	.09325
HEALTH	.	-.02913	.11476	.15291	.02872	-.07703
EMOTION	.	.04933	-.04940	.17823	.13313	.00258
EMPLOY	.	.26035	-.00144	-.13815	.04356	.12401
OFFENTYP	.	.09806	-.00667	-.20071	-.03381	.15867
PRIORD	.	-.03074	.14373	-.00447	.16604	.55545
PRIOROFF	.	.01384	.07543	.03430	-.11143	.11142
RELATION	.	.25923	.17891	.24459	.08474	-.08509
SKILLS	.	.12675	.11737	.08002	.01637	.20163

	COMPANY	DRUG	FINANCES	FIRSTCON	HEALTH	EMOTION
COMPANY	1.00000					
DRUG	.24963	1.00000				
FINANCES	.11285	.18917	1.00000			
FIRSTCON	.21098	.07739	.02423	1.00000		
HEALTH	.02476	-.04032	.18763	-.13334	1.00000	
EMOTION	.07738	.04196	.01496	-.11365	.31331	1.00000
EMPLOY	.13661	.27241	.19115	.11434	.04214	.05728
OFFENTYP	.07934	.12087	.05521	.21646	.01659	.01768
PRIORD	.01831	.04090	.10292	.25401	-.00600	.11961
PRIOROFF	.04590	.13174	-.03865	.25951	-.02167	.06603
RELATION	.17698	-.05761	.17723	.16350	.25045	.16072
SKILLS	.18755	-.00700	.18648	.09438	.01873	-.13973
	EMPLOY	OFFENTYP	PRIORD	PRIOROFF	RELATION	SKILLS
EMPLOY	1.00000					
OFFENTYP	.11218	1.00000				
PRIORD	.14779	.29375	1.00000			
PRIOROFF	.02533	.20170	.27762	1.00000		
RELATION	.00365	.03701	.13937	.16112	1.00000	
SKILLS	.06720	-.08850	.06567	.05529	.04380	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 155 degrees of freedom

Variable	Wilks' Lambda	F	Significance
-----	-----	-----	-----
ABILITY is a constant.			
ADDRESS	.99942	.0894	.7653
ALCOHOL	.95786	6.8190	.0099
ASSAULT	.99998	.0032	.9549
ATTITUDE	.99785	.3338	.5643
BREACHES	.91322	14.7285	.0002
COMPANY	.96534	5.5658	.0196
DRUG	.99512	.7602	.3846
FINANCES	.99463	.8366	.3618
FIRSTCON	.96621	5.4203	.0212
HEALTH	.99878	.1893	.6641
EMOTION	.99863	.2125	.6455
EMPLOY	.97538	3.9128	.0497
OFFENTYP	.90783	15.7364	.0001
PRIORD	.91368	14.6434	.0002
PRIOROFF	.98282	2.7087	.1018
RELATION	.99981	.0296	.8637
SKILLS	.98756	1.9523	.1643

Appendix H (ii)

Risk, Need, Metropolitan Location, and Offending Status: Discriminant Analysis

Group means

RECID	ALCOHOL	BREACHES	COMPANY	FIRSTCON
1	.91667	.61111	.88889	3.13889
2	1.52941	1.69412	1.48235	3.60000
Total	1.24841	1.19745	1.21019	3.38854
RECID	OFFENTYP	EMPLOY		
1	1.45833	.83333		
2	2.35294	1.11765		
Total	1.94268	.98726		

Group standard deviations

RECID	ALCOHOL	BREACHES	COMPANY	FIRSTCON
1	1.42166	1.44919	1.53417	1.49464
2	1.50070	1.98820	1.60068	.96609
Total	1.49210	1.83778	1.59338	1.25397
RECID	OFFENTYP	EMPLOY		
1	1.39352	.88811		
2	1.42014	.90517		
Total	1.47301	.90573		

Pooled within-groups covariance matrix with 155 degrees of freedom

	ALCOHOL	BREACHES	COMPANY	FIRSTCON
ALCOHOL	2.1463			
BREACHES	.2802	3.1042		
COMPANY	.5718	.0737	2.4667	
FIRSTCON	.2118	.2032	.4097	1.5291
EMPLOY	-1.8975332E-03	.1961	.1925	.1269
OFFENTYP	-.0138	.3936	.1755	.3769
	EMPLOY	OFFENTYP		
EMPLOY	.8053			
OFFENTYP	.1417	1.9825		

Pooled within-groups correlation matrix

	ALCOHOL	BREACHES	COMPANY	FIRSTCON	EMPLOY	OFFENTYP
ALCOHOL	1.00000					
BREACHES	.10855	1.00000				
COMPANY	.24851	.02665	1.00000			
FIRSTCON	.11693	.09325	.21098	1.00000		
EMPLOY	-.00144	.12401	.13661	.11434	1.00000	
OFFENTYP	-.00667	.15867	.07934	.21646	.11218	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 155 degrees of freedom

Variable	Wilks' Lambda	F	Significance
ALCOHOL	.95786	6.8190	.0099
BREACHES	.91322	14.7285	.0002
COMPANY	.96534	5.5658	.0196
FIRSTCON	.96621	5.4203	.0212
EMPLOY	.97538	3.9128	.0497
OFFENTYP	.90783	15.7364	.0001

On groups defined by RECID reoffenders and non reoffenders: Analysis number 1

Direct method: all variables passing the tolerance test are entered.

Minimum tolerance level..... .00100

Canonical Discriminant Functions

Maximum number of functions..... 1
Minimum cumulative percent of variance... 100.00
Maximum significance of Wilks' Lambda.... 1.0000

Prior probabilities

Group	Prior	Label
1	.45860	non re-offender
2	.54140	re-offender
Total	1.00000	

Classification function coefficients: (Fisher's linear discriminant functions)

RECID =	1 non re-offen der	2 re-offender
ALCOHOL	.2729968	.4825029
BREACHES	-.0380120	.2257027
COMPANY	-.0974854	.0305527
FIRSTCON	1.9032606	2.0034930
EMPLOY	.7080692	.8881449
OFFENTYP	.3412294	.6983161
(Constant)	-4.3806653	-6.1205479

Canonical Discriminant Functions

		Pct of	Cum	Canonical	After	Wilks'			
Fcn	Eigenvalue	Variance	Pct	Corr	Fcn	Lambda	Chi-square	df	Sig
				:	0 .814293		31.226	6	.0000
1*	.2281	100.00	100.00	.4309	:				

* Marks the 1 canonical discriminant functions remaining in the analysis.

Standardized canonical discriminant function coefficients

	Func 1
ALCOHOL	.32231
BREACHES	.48792
COMPANY	.21117
FIRSTCON	.13016
EMPLOY	.16970
OFFENTYP	.52798

Structure matrix:

Pooled within-groups correlations between discriminating variables
and canonical discriminant functions
(Variables ordered by size of correlation within function)

	Func 1
OFFENTYP	.66721
BREACHES	.64549
ALCOHOL	.43921
COMPANY	.39680
FIRSTCON	.39158
EMPLOY	.33270

Canonical discriminant functions evaluated at group means (group centroids)

Group	Func 1
1	-.51556
2	.43671

Test of Equality of Group Covariance Matrices Using Box's M

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Group Label	Rank	Log Determinant
1 non re-offender	6	2.961096
2 re-offender	6	3.261457
Pooled within-groups covariance matrix	6	3.438538

Box's M	Approximate F	Degrees of freedom	Significance
48.77317	2.22579	21,	83405.5 .0010

SPSS Version 7.5 Output for Box's M Alpha Level**Test Results**

Box's M	48.773
F	Approx. 2.226
	df1 21
	df2 83405.479
	Sig. .00102

Tests null hypothesis of equal population covariance matrices.

Classification results

Actual Group	No. of Cases	Predicted Group Membership	
		1	2
Group 1 non re-offender	72	47 65.3%	25 34.7%
Group 2 re-offender	85	23 27.1%	62 72.9%

Percent of "grouped" cases correctly classified: 69.43%

All-Groups Stacked Histogram

Symbols used in plots

Symbol	Group	Label
-----	-----	-----
1	1	non re-offender
2	2	re-offender

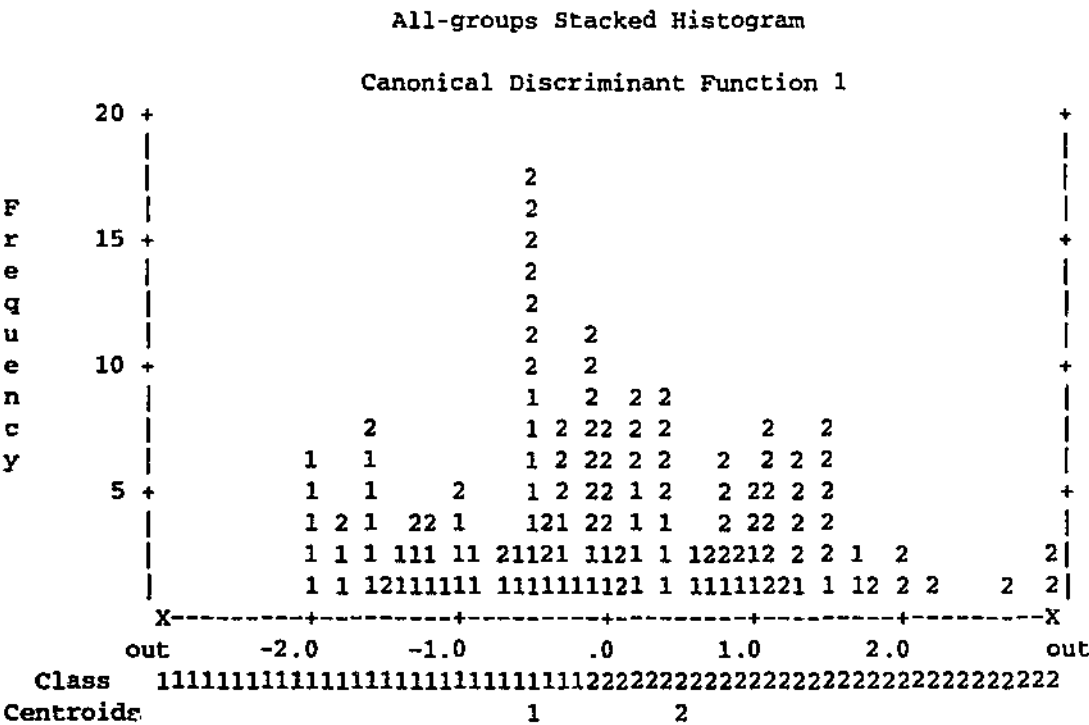


Figure H4. All-groups stacked histogram displaying separation of groups by the discriminant function, based on the selected risk and need predictor variable scores.

Appendix I (i)

Risk, Need, Aboriginality and Offending Status: Preliminary Analysis

Predictor Variables

The predictor variables were change of address (address), attitude to offence (attitude), number of prior orders (priorord); number of breaches (breaches); age of first conviction (firstcon); number of prior indictable offence (prioroff); convictions for offences types (offentyp); assaultive offences in last two years (assault); time employed in last twelve months (employ) alcohol use problems (alcohol); drug use (drug); marital/family relationships (relation); academic/vocation skills (skills); financial management (finances); companions (company); health (health); mental ability (ability); and emotional stability (emotion).

Pooled within-groups correlation matrix

	ABILITY	ADDRESS	ALCOHOL	ASSAULT	ATTITUDE	BREACHES
ABILITY	.					
ADDRESS	.	1.00000				
ALCOHOL	.	-.05389	1.00000			
ASSAULT	.	-.07066	.13213	1.00000		
ATTITUDE	.	.17055	.18807	.20842	1.00000	
BREACHES	.	-.00253	-.06137	.10217	-.00394	1.00000
COMPANY	.	-.05158	.28921	-.13069	-.08527	.04697
DRUG	.	-.02342	.13595	.12270	.35267	.07944
EMOTION	.	-.01018	.05491	.08764	.13889	-.09395
EMPLOY	.	-.01021	.13617	-.09231	.14852	-.00443
FINANCES	.	.38141	.26435	-.13358	.16320	.18389
FIRSTCON	.	.09234	-.12747	-.09675	.08329	.05448
HEALTH	.	.02543	.32518	.20602	-.01241	-.22544
OFFENTYP	.	.12042	.07283	.10742	.19470	.26975
PRIORD	.	-.01200	-.00783	.21687	.14720	.49247
PRIOROFF	.	-.12071	-.05949	.14394	-.14044	.26099
RELATION	.	.29882	.37898	.10453	-.03789	-.02338
SKILLS	.	.21381	.00074	-.03174	-.16142	.08594

	COMPANY	DRUG	EMOTION	EMPLOY	FINANCES	FIRSTCON
COMPANY	1.00000					
DRUG	-.04378	1.00000				
EMOTION	.19073	-.20422	1.00000			
EMPLOY	.07025	.22813	-.13229	1.00000		
FINANCES	-.05690	.14841	-.08211	.04719	1.00000	
FIRSTCON	-.09673	.13905	.03857	.09140	.07053	1.00000
HEALTH	.17073	-.21325	.35533	-.20281	-.02505	-.38826
OFFENTYP	-.00529	.32008	-.20891	.32892	-.00821	.22129
PRIORD	.00701	.20855	.10801	.13183	.07388	.20682
PRIOROFF	.15355	.11727	.19201	-.13678	-.13668	.11098
RELATION	.43410	-.17152	.20075	-.23621	.22268	-.17127
SKILLS	.23021	-.05220	-.03960	.18454	.09725	-.31033
	HEALTH	OFFENTYP	PRIORD	PRIOROFF	RELATION	SKILLS
HEALTH	1.00000					
OFFENTYP	-.13078	1.00000				
PRIORD	-.20530	.28100	1.00000			
PRIOROFF	-.05531	.03312	.21799	1.00000		
RELATION	.21938	.00897	-.00674	.01062	1.00000	
SKILLS	.22580	-.10722	.04386	.04981	.20639	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 57 degrees of freedom

Variable	Wilks' Lambda	F	Significance
-----	-----	-----	-----
ABILITY is a constant.			
ADDRESS	.98985	.5844	.4477
ALCOHOL	.99997	.0015	.9694
ASSAULT	.99203	.4579	.5013
ATTITUDE	.99316	.3927	.5334
BREACHES	.97895	1.2257	.2729
COMPANY	.98839	.6694	.4167
DRUG	.97816	1.2726	.2640
EMOTION	.99928	.0410	.8402
EMPLOY	.99268	.4205	.5193
FINANCES	.99643	.2043	.6530
FIRSTCON	.98986	.5838	.4480
HEALTH	.99857	.0815	.7763
OFFENTYP	.90258	6.1525	.0161
PRIORD	.97667	1.3618	.2481
PRIOROFF	.97367	1.5415	.2195
RELATION	.98071	1.1211	.2941
SKILLS	.99226	.4446	.5076

Structure matrix

Pooled within-groups correlations between discriminating variables
and canonical discriminant functions
(Variables ordered by size of correlation within function)

	Func 1
OFFENTYP	.66909
PRIOROFF	.33491
PRIORD	.31478
DRUG	.30430
BREACHES	.29864
RELATION	-.28562
COMPANY	-.22070
ADDRESS	.20622
FIRSTCON	.20611
ASSAULT	.18254
SKILLS	.17987
EMPLOY	.17491
ATTITUDE	.16904
FINANCES	-.12193
HEALTH	-.07702
EMOTION	.05462
ALCOHOL	-.01039

Appendix I (ii)

Risk, Need, Aboriginality and Offending Status: Discriminant Analysis

Group means

RECID	OFFENTYP	PRIOROFF
1	1.86957	.86957
2	2.66667	1.44444
Total	2.35593	1.22034

Group standard deviations

RECID	OFFENTYP	PRIOROFF
1	.96786	1.57550
2	1.33095	1.82748
Total	1.25619	1.74265

Pooled within-groups covariance matrix with 57 degrees of freedom

	OFFENTYP	PRIOROFF
OFFENTYP	1.4493	
PRIOROFF	.0692	3.0087

Pooled within-groups correlation matrix

	OFFENTYP	PRIOROFF
OFFENTYP	1.00000	
PRIOROFF	.03312	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 57 degrees of freedom

Variable	Wilks' Lambda	F	Significance
OFFENTYP	.90258	6.1525	.0161
PRIOROFF	.97367	1.5415	.2195

Analysis number 1

Direct method: all variables passing the tolerance test are entered.

Minimum tolerance level..... .00100

Canonical Discriminant Functions

Maximum number of functions..... 1
Minimum cumulative percent of variance... 100.00
Maximum significance of Wilks' Lambda.... 1.0000

Prior probabilities

Group	Prior	Label
1	.38983	non re-offender
2	.61017	re-offender
Total	1.00000	

Classification function coefficients

(Fisher's linear discriminant functions)

RECID	=	1	2
		non re-offen	re-offender
		der	
OFFENTYP		1.2776098	1.8190860
PRIOROFF		.2596471	.4382711
(Constant)		-2.2492207	-3.2359957

Canonical Discriminant Functions

	Pct of	Cum	Canonical	After	Wilks'				
Fcn	Eigenvalue	Variance	Pct	Corr	Fcn	Lambda	Chi-square	df	Sig
1*	.1315	100.00	100.00	.3410	0	.883744	6.921	2	.0314

* Marks the 1 canonical discriminant functions remaining in the analysis.

Standardized canonical discriminant function coefficients

	Func 1
OFFENTYP	.89179
PRIOROFF	.42388

Structure matrix

Pooled within-groups correlations between discriminating variables
and canonical discriminant functions
(Variables ordered by size of correlation within function)

	Func 1
OFFENTYP	.90583
PRIOROFF	.45341

Canonical discriminant functions evaluated at group means (group centroids)

Group	Func 1
1	-.44601
2	.28495

Test of Equality of Group Covariance Matrices Using Box's M

The ranks and natural logarithms of determinants printed are those
of the group covariance matrices.

Group Label	Rank	Log Determinant
1 non re-offender	2	.633555
2 re-offender	2	1.761838
Pooled within-groups covariance matrix	2	1.471484

Box's M	Approximate F	Degrees of freedom	Significance
8.27206	2.64479	3,	95424.4 .0477

Classification results

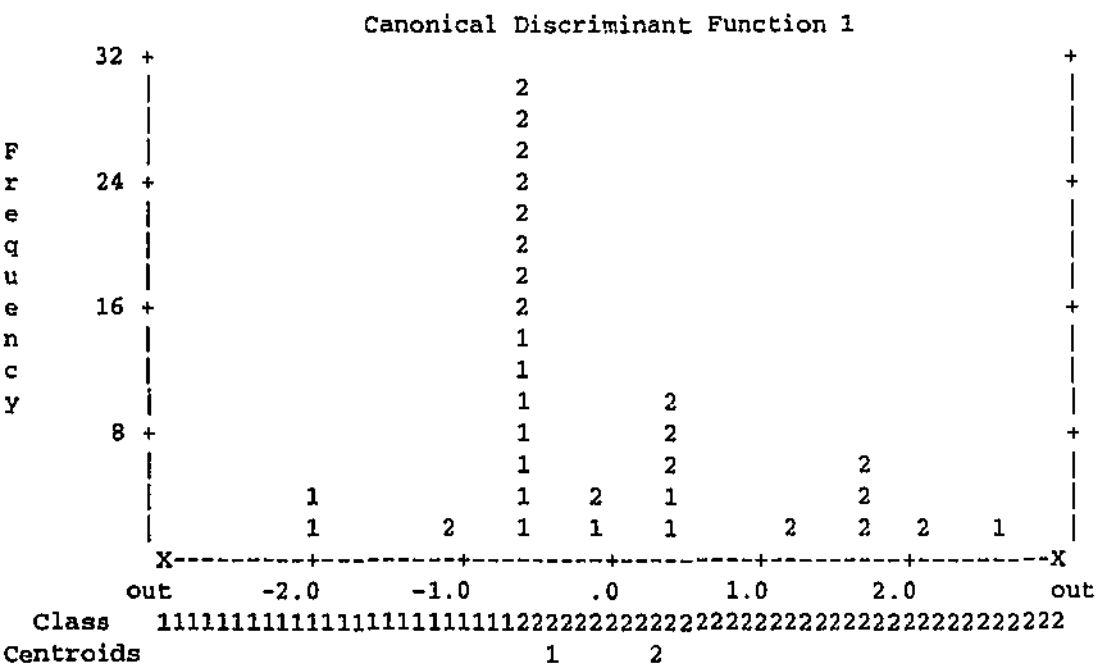
Actual Group	No. of Cases	Predicted Group Membership	
		1	2
Group 1 non re-offender	23	3 13.0%	20 87.0%
Group 2 re-offender	36	1 2.8%	35 97.2%

Percent of "grouped" cases correctly classified: 64.41%

All-groups Stacked Histogram

Symbols used in plots

Symbol	Group	Label
1	1	non re-offender
2	2	re-offender



Appendix J (i)

Risk, Need, Non Aboriginality and Offending Status: Preliminary Analysis

Predictor Variables

The predictor variables were change of address (address), attitude to offence (attitude), number of prior orders (priorord); number of breaches (breaches); age of first conviction (firstcon); number of prior indictable offence (prioroff); convictions for offences types (offentyp); assaultive offences in last two years (assault); time employed in last twelve months (employ) alcohol use problems (alcohol); drug use (drug); marital/family relationships (relation); academic/vocation skills (skills); financial management (finances); companions (company); health (health); mental ability (ability); and emotional stability (emotion).

Pooled within-groups correlation matrix

	ABILITY	ADDRESS	ALCOHOL	ASSAULT	ATTITUDE	BREACHES
ABILITY	.					
ADDRESS	.	1.00000				
ALCOHOL	.	-.06365	1.00000			
ASSAULT	.	-.02121	.14353	1.00000		
ATTITUDE	.	.02131	.07274	-.06015	1.00000	
BREACHES	.	.02610	.19108	-.01011	.10158	1.00000
COMPANY	.	.08631	.22214	-.06260	.21998	.02567
DRUG	.	.11585	.08462	-.16806	.18223	.02443
EMOTION	.	.00330	.03948	.23314	.13396	.04471
EMPLOY	.	.31578	.05051	-.11628	.06718	.16322
FINANCES	.	.13367	.03383	-.24134	.07960	.05466
FIRSTCON	.	.04195	.13142	-.25227	-.01834	.10918
HEALTH	.	.04399	.09616	.09495	.12844	-.03172
OFFENTYP	.	.05983	.02519	-.24717	-.02925	.16068
PRIORD	.	-.03001	.19700	-.08270	.13546	.55263
PRIOROFF	.	.01468	.07151	-.04436	-.11614	.10240
RELATION	.	.22114	.17623	.17361	.08575	-.04328
SKILLS	.	.08972	.08108	.04281	.10766	.05669

	COMPANY	DRUG	EMOTION	EMPLOY	FINANCES	FIRSTCON
COMPANY	1.00000					
DRUG	.31646	1.00000				
EMOTION	.15768	.03490	1.00000			
EMPLOY	.12819	.25954	.05529	1.00000		
FINANCES	.24228	.21024	.04974	.20248	1.00000	
FIRSTCON	.20943	.11352	-.12189	.14593	.03205	1.00000
HEALTH	.03484	.01000	.37665	.13380	.25501	-.06163
OFFENTYP	.13203	.21757	.01709	.15933	.14332	.20678
PRIORD	.02215	.07079	.10207	.20293	.09638	.27143
PRIOROFF	.10553	.14545	.03764	.06340	.00029	.27449
RELATION	.18553	-.00239	.20892	.13415	.19369	.18397
SKILLS	.24168	.00990	-.07011	.08032	.20281	.15212
	HEALTH	OFFENTYP	PRIORD	PRIOROFF	RELATION	SKILLS
HEALTH	1.00000					
OFFENTYP	.09158	1.00000				
PRIORD	.06445	.34310	1.00000			
PRIOROFF	-.03287	.23425	.33001	1.00000		
RELATION	.22355	.03459	.18133	.15996	1.00000	
SKILLS	-.00622	-.09379	.02072	.07335	.06455	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 153 degrees of freedom

Variable	Wilks' Lambda	F	Significance
-----	-----	-----	-----
ABILITY is a constant.			
ADDRESS	.99367	.9746	.3251
ALCOHOL	.97470	3.9714	.0481
ASSAULT	.99773	.3487	.5557
ATTITUDE	.99527	.7274	.3951
BREACHES	.94272	9.2971	.0027
COMPANY	.96785	5.0817	.0256
DRUG	.98311	2.6291	.1070
EMOTION	.99925	.1143	.7357
EMPLOY	.97663	3.6613	.0576
FINANCES	.99157	1.3014	.2557
FIRSTCON	.95605	7.0328	.0088
HEALTH	.99994	.0092	.9236
OFFENTYP	.94385	9.1019	.0030
PRIORD	.94240	9.3514	.0026
PRIOROFF	.99905	.1456	.7033
RELATION	.99983	.0261	.8718
SKILLS	.99778	.3402	.5606

Appendix J (ii)

Risk, Need, Non Aboriginality and Offending Status: Discriminant Analysis

Group means

RECID	ALCOHOL	BREACHES	COMPANY	FIRSTCON
1	.90667	.53333	.77333	2.96000
2	1.37500	1.35000	1.32500	3.52500
Total	1.14839	.95484	1.05806	3.25161
RECID	OFFENTYP	PRIORD		
1	1.42667	1.44000		
2	2.20000	2.40000		
Total	1.82581	1.93548		

Group standard deviations

RECID	ALCOHOL	BREACHES	COMPANY	FIRSTCON
1	1.44422	1.36890	1.47569	1.55477
2	1.47875	1.90336	1.56525	1.06706
Total	1.47619	1.71071	1.54264	1.35126
RECID	OFFENTYP	PRIORD		
1	1.60382	1.93293		
2	1.58633	1.97196		
Total	1.63623	2.00544		

Pooled within-groups covariance matrix with 153 degrees of freedom

	ALCOHOL	BREACHES	COMPANY	FIRSTCON
ALCOHOL	2.1379			
BREACHES	.4656	2.7769		
COMPANY	.4945	.0651	2.3183	
FIRSTCON	.2547	.2412	.4227	1.7571
OFFENTYP	.0587	.4270	.3206	.4371
PRIORD	.5626	1.7987	.0659	.7027
	OFFENTYP	PRIORD		
OFFENTYP	2.5434			
PRIORD	1.0688	3.8149		

Pooled within-groups correlation matrix

	ALCOHOL	BREACHES	COMPANY	FIRSTCON	OFFENTYP	PRIORD
ALCOHOL	1.00000					
BREACHES	.19108	1.00000				
COMPANY	.22214	.02567	1.00000			
FIRSTCON	.13142	.10918	.20943	1.00000		
OFFENTYP	.02519	.16068	.13203	.20678	1.00000	
PRIORD	.19700	.55263	.02215	.27143	.34310	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 1 and 153 degrees of freedom

Variable	Wilks' Lambda	F	Significance
ALCOHOL	.97470	3.9714	.0481
BREACHES	.94272	9.2971	.0027
COMPANY	.96785	5.0817	.0256
FIRSTCON	.95605	7.0328	.0088
OFFENTYP	.94385	9.1019	.0030
PRIORD	.94240	9.3514	.0026

Prior probabilities

Group	Prior	Label
1	.48387	non re-offender
2	.51613	re-offender
Total	1.00000	

Classification function coefficients
(Fisher's linear discriminant functions)

RECID	=	1 non re-offen der	2 re-offender
ALCOHOL		.2482697	.3498889
BREACHES		-.0135159	.1779267
COMPANY		-.0516614	.0989125
FIRSTCON		1.6002928	1.7728828
OFFENTYP		.3020904	.4991445
PRIORD		-.0313049	.0254911
(Constant)		-3.3762909	-4.7919314

Canonical Discriminant Functions

Fcn	Eigenvalue	Pct of Variance	Cum Pct	Canonical Corr	After Fcn	Wilks' Lambda	Chi-square	df	Sig
1*	.1496	100.00	100.00	.3608	: 0	.869842	20.917	6	.0019

* Marks the 1 canonical discriminant functions remaining in the analysis.

Standardized canonical discriminant function coefficients

	Func 1
ALCOHOL	.19320
BREACHES	.41483
COMPANY	.29811
FIRSTCON	.29748
OFFENTYP	.40864
PRIORD	.14425

Structure matrix

Pooled within-groups correlations between discriminating variables
and canonical discriminant functions
(Variables ordered by size of correlation within function)

	Func 1
PRIORD	.63911
BREACHES	.63725
OFFENTYP	.63053
FIRSTCON	.55425
COMPANY	.47113
ALCOHOL	.41650

Unstandardized canonical discriminant function coefficients

	Func 1
ALCOHOL	.1321370
BREACHES	.2489358
COMPANY	.1957935
FIRSTCON	.2244215
OFFENTYP	.2562325
PRIORD	.0738526
(Constant)	-1.9371033

Canonical discriminant functions evaluated at group means (group centroids)

Group	Func 1
1	-.39693
2	.37212

Test of Equality of Group Covariance Matrices Using Box's M

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Group Label	Rank	Log Determinant
1 non re-offender	6	4.267849
2 re-offender	6	4.508693
Pooled within-groups covariance matrix	6	4.704850

Box's M	Approximate F	Degrees of freedom	Significance
47.83440	2.18249	21,	85335.7 .0013

Classification results

Actual Group		No. of Cases	Predicted Group Membership	
			1	2
-----		-----	-----	-----
Group	1	75	51	24
non re-offender			68.0%	32.0%
Group	2	80	25	55
re-offender			31.3%	68.8%

Percent of "grouped" cases correctly classified: 68.39%

Classification processing summary

- 155 (Unweighted) cases were processed.
- 0 cases were excluded for missing or out-of-range group codes.
- 0 cases had at least one missing discriminating variable.
- 155 (Unweighted) cases were used for printed output.

Appendix K

Risk Level, Intervention and Offending Status: Chi-square Analysis

INTERVEN by RECID Recid

Page 1 of 1

		RECID		
		Count		
		Exp Val		
INTERVEN	Row Pct	Non	Re-o	Re-offen
	Col Pct	ffender	der	
	Tot Pct	1	2	Row Total
c/work alone	1	11	58	69
		30.7	38.3	34.8%
		15.9%	84.1%	
		12.5%	52.7%	
		5.6%	29.3%	
specialist	2	30	16	46
		20.4	25.6	23.2%
		65.2%	34.8%	
		34.1%	14.5%	
		15.2%	8.1%	
spec + c/work	3	39	9	48
		21.3	26.7	24.2%
		81.3%	18.8%	
		44.3%	8.2%	
		19.7%	4.5%	
None	4	8	27	35
		15.6	19.4	17.7%
		22.9%	77.1%	
		9.1%	24.5%	
		4.0%	13.6%	
Column		88	110	198
Total		44.4%	55.6%	100.0%

Chi-Square	Value	DF	Significance
Pearson	63.68139	3	.00000
Likelihood Ratio	68.09929	3	.00000
Mantel-Haenszel test for linear association	8.12622	1	.00436

Minimum Expected Frequency - 15.556

Approximate Statistic	Value	ASE1	Val/ASE0	Significance
-----	-----	-----	-----	-----
Phi	.56712			.00000 *1
Cramer's V	.56712			.00000 *1

*1 Pearson chi-square probability

Number of Missing Observations: 0