THE RELATIONSHIP BETWEEN THE URICA AND CORRECTIONAL TREATMENT IN A SAMPLE OF VIOLENT MALE OFFENDERS

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Abstract

The usefulness of the University of Rhode Island Change Assessment scale (URICA) in identifying treatment progress in violent adult offenders was evaluated in this archival study. The 198 men in the study participated in a 21-week treatment program at a Canadian federal institution. On average, individuals were 31 years old with four prior violent convictions. Most offenders were Aboriginal (53%). Study variables included self-report questionnaires (e.g., URICA, Criminal Sentiments Scale–Modified, State-Trait Anger Expression Inventory), staff ratings of treatment participation (Group Behaviour Checklist [GBC]), and risk measures (Security Reclassification Scale, Violence Risk Scale [VRS], Psychopathy Checklist–Revised). Post-treatment institutional misconduct information was available for 193 individuals and recidivism data was collected for the 50 individuals who were released to the community. The psychometric properties of the URICA for this sample were similar to those found in past research. Cluster analyses of pre- and post-treatment URICA data produced five-cluster solutions. These cluster profiles were consistent with previous research and rank-ordered to reflect increasing readiness for change. Profile rankings correlated significantly with anger problems and antisocial attitudes at pre- and post-treatment. GBC scores for individuals in less advanced profiles "peaked" at treatment week 15 and then decreased, whereas those in more advanced profiles improved throughout treatment. Differences in GBC scores between these two profile groups may have been delayed until the second half of treatment due to the increasing difficulty of treatment material. Profile rankings were not

correlated with risk measures and correlated minimally with institutional misconduct/recidivism. Profile rankings correlated significantly with stage membership (from the VRS) at pre- but not post-treatment; the different time frames involved in scoring the URICA and VRS resulted in the URICA being more susceptible to fluctuations in mood or environment at post-treatment. When comparing the strength of the correlations between profile rankings and VRS stages with other variables, the VRS stages had significantly stronger correlations with risk measures. Overall, the URICA was useful in identifying treatment progress, and the URICA's strength was in identifying short-term change rather than long-term change, which was consistent with past research.

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CHAPTER 1: INTRODUCTION[1]

Violence in Canada

The violent crime rate in Canada increased between 1983 and 1993 but has been decreasing since the early 1990s (Johnson & Boe, 1997; Statistics Canada, 2003). In 2002, approximately 275 000 nonsexual violent offences were reported, representing 12% of all Criminal Code violations (Statistics Canada, 2003). In 2000-2001, the conviction rate for violent offences was 54% (Statistics Canada, 2002). It is important to remember that many factors influence official statistics (e.g., changes in legal definitions, police discretionary powers), so the violent crime rate is likely an underestimation of the true number of violent offences that occur each year. However, based on the information that is available to forensic researchers and clinicians, it is clear that a large number of violent offences occur each year with a substantial proportion of individuals charged with these offences coming into extended contact with the criminal justice system.

However, focusing only on individuals that have committed recent violent offences may be misleading since many offenders have violent tendencies. Motiuk and Belcourt (1997) found that over 80% of 6403 male federal inmates had committed a past violent crime. In the 1995 National Inmate Survey, Robinson, Muirhead, and Lefaive (1997) reported that 62% of 3972 male federal inmates had committed a past violent (nonsexual) offence. Thus, many offenders have difficulty in managing violent behaviour and may benefit from some form of treatment during their incarceration.

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[1] The following literature review focuses heavily on research conducted within the Correctional Service of Canada in order to link the previous research as directly as possible to the sample being studied in the current project. Also, although some of the reviewed studies did not report statistically significant outcomes, they provide evidence for the clinical significance of many treatment programs.

The need for treatment was demonstrated by Motiuk and Belcourt's (1997) study of incarcerated offenders. The study participants were federal offenders who were released from custody during 1992 and 1993. Violent offenders (defined as those whose most recent conviction was for violence) were significantly more likely than non-violent offenders to have had committed past violent offences (62% versus 40%). More importantly, during the three-year follow up period violent offenders committed significantly more new offences than non-violent offenders; 40% committed a new offence or breach and 20% were convicted of a new violent offence. This speaks to the need for the development of institutional-based violence treatment programs designed to help violent offenders manage their behaviour, particularly those who are preparing for release from incarceration. The current study is an attempt to measure treatment progress in a sample of violent offenders, with a particular emphasis on motivation to change.

Principles Guiding Forensic Treatment

In wake of the belief that nothing worked in forensic treatment, Andrews (1989) developed three main principles to guide therapeutic interventions. The first is the Risk principle, in which individuals at greater risk for reoffending require more intensive treatment. The second principle is the Needs principle. Treatment interventions designed to reduce reoffending must focus on factors that are empirically and/or theoretically linked to criminal behaviour. Third, the Responsivity principle involves selecting service delivery styles that match the offender's abilities and learning style. Andrews (1989) identified motivation as one responsivity factor that required systematic study. Two studies illustrated the role played by motivation. Baxter, Marion, and Gouguen (1995) administered the Attitudes Toward Correctional Treatment scale (ATCT) to 476 federally incarcerated male Canadian offenders who participated in either an addictions program or an anger management program. Participants with high scores on the motivation subscale of the ATCT received significantly better staff-rated treatment outcomes than low scorers in both programs. Stewart and Millson (1995) collected data for 2400 male Canadian

offenders' Community Offender Management Strategy documents. Level of motivation (as rated by case management officers) was significantly related to conditional release outcome; "offenders rated as highly motivated had generally better outcomes [21% recidivism] than offenders rated as moderately motivated [29%] and considerably better outcomes than those with low motivation [35%]" (p. 6).

Meta-analyses of treatment data have shown considerable support for the utility of the Risk, Needs, and Responsivity principles in reducing recidivism within a variety of populations (e.g., male, female, young offenders) across institutional and community settings (e.g., Andrews, Zinger, Hoge, Bonta, Gendreau, & Cullen, 1990; Antonowicz & Ross, 1994; Dowden & Andrews, 1999a, 1999b; Hill, Andrews, & Hoge 1991; Lipsey, 1995). McGuire (2001) reviewed 18 meta-analyses of treatment outcome studies that were conducted since 1985. Fifteen of the 18 studies found positive effects for treatment reducing recidivism. The mean effect sizes for treatment over control groups were uniformly greater but fairly modest. The mean phi coefficient was estimated to be in the region of 0.1 (see Losel, 1995; McGuire, 2001). This was lower than that obtained for psychotherapy outcomes but larger than the outcomes of certain medical interventions (e.g., use of aspirin to reduce the risk of myocardial infarction). McGuire (2001) pointed out that the meta-analyses included some interventions that did not reduce recidivism or were associated with increases in recidivism (e.g., criminal sanctioning, deterrence), and that if these studies were excluded the mean effect for treatment would have been greater. Although McGuire's (2001) review was encouraging, it is important to note that only one of the 18 meta-analyses reviewed focused specifically on violent adult male offenders and was directly applicable to the current study.

According to Gendreau and Goggin (1996), meta-analyses of offender treatment studies found that programs reduced recidivism by about 10%. However, they pointed out that when programs were "appropriate" (i.e., behavioural, structured, and targeted the

criminogenic attitudes, values and behaviours of higher-risk offenders), there was an average reduction in recidivism of 25% to 30%.

Correctional Treatment Programs for Violent Offenders

Serin and Brown (1997) conducted a national survey of 74 violence treatment programs as part of an effort to catalogue Canadian correctional programs. Unfortunately, the response rate to their inquiries was only 38%. Thirty-one percent of the responding programs focused on an Anger and Emotions Management approach, 18% were comprised of a Living Without Violence program, and 51% were designated as an undisclosed "other". Seventy-three percent of programs were exclusively group-oriented, with the remainder offering both group and individual treatment. Most (85%) of the programs had a cognitive-behavioural focus.

An evaluation of the programs in terms of Andrews' (1989) Risk, Needs, and Responsivity principles produced evidence of weaknesses in the Canadian approach to treating violence. It appeared that some of the programs surveyed violated the Risk principle. The selection criteria for most programs included a current conviction for violence, but few programs considered past violent behaviour as a factor. In fact, only 17% of programs had risk assessment as part of the selection criteria. Furthermore, offenders averaged only 33 hours of therapeutic contact in the programs. Thus, high-risk offenders were not targeted specifically for treatment, nor did they receive intensive services.

The programs fared better in relation to the Needs principle. Over 80% of the responding programs included treatment targets that influence violent behaviour, including insight, communication skills, cognitive distortions, and problem-solving. However, the majority of the programs were exclusively group-oriented. This makes it unlikely that treatment services were individualized in order to address offenders' specific criminogenic needs.

In terms of the Responsivity principle, many programs automatically excluded offenders based on lack of motivation. Thirty percent of programs excluded offenders with low motivation and 12% excluded inmates who denied that they required treatment. Serin and Brown (1997) commented that "with nearly 40% of programs excluding such offenders, this identifies an emerging new treatment target group" (p. 36). These treatment programs were not responsive to offenders' needs and excluded them from treatment rather than attempt to engage them in treatment.

Dowden and Andrews (2000) conducted a meta-analysis of the role of the Risk, Needs, and Responsivity principles in reducing violent recidivism. They reviewed 35 studies that used violent recidivism as an outcome measure and found the overall mean effect size was .07 (suggestive of a mildly positive effect). Further exploration of these results showed that the mean effect size for criminal sanctions alone was -.01. This was significantly different from the .12 mean effect size for human service interventions. When the authors investigated adherence to the Risk, Needs, and Responsivity principles, they found that the mean effect size was greater when these principles were followed. Correlations with effect size found significant results with Needs (Eta = .59) and Responsivity (Eta = .52), and a nonsignificant result with Risk (Eta = .16). Further analysis found that mean effect size increased linearly with increased adherence to each of the principles. The authors concluded that the utility of the Risk, Needs, and Responsivity principles was demonstrated with violent recidivism, "thus further supporting the robustness of these principles" (p. 461).

Thus, effective programs for violent offenders should provide in-depth services to the most high-risk offenders, and treatment should focus on factors that contribute to violence. The manner in which services are provided should be dictated by the offender's learning style, abilities, and level of motivation. Andrews' (1989) theorizing appears compatible with the notion of 'treatability', which is "the clinical determination of which

patients under what treatment modalities and environmental conditions will respond most favorably" (Rogers & Webster, 1989; p. 20).

Specific Treatment Programs

Research on the treatment of violent offending is surprisingly small, particularly in contrast to the research on treatment of sexual and spousal abuse offending (e.g., Blackburn, 1988; Polaschek & Reynolds, 2000; Serin & Preston, 2001). Smiley, Mulloy, and Brown (1997) reported that treatment efficacy studies are scarce since "there are few institutional treatment programs aimed specifically at reducing violent offenders' risk to reoffend" (p. 44). Others (e.g., Losel, 2001; Serin & Brown, 1996) have indicated that research on the treatment of violent offenders has been plagued by methodological limitations such as reliance on self-report measures. Regardless of these limitations, a review of the literature provides guidance for treatment of violent adult offenders.

Recidivism or institutional misconduct as outcome measure. Carney (1977) described an outpatient Special Offender Clinic (SOC) developed by the Maryland Department of Probation. Patients were either outpatient sexual offenders or aggressive offenders who had received multiple assault convictions. The average treatment period was 13.1 months and average follow-up period was 8.8 months. Unfortunately, no description of the treatment process was provided other than statements that it was court-ordered group psychotherapy developed to help participants achieve control over their violent behaviour. The recidivism rate for all participants was 28%; however, no specific data regarding types of new offences was reported. Carney (1977) concluded by reporting "not surprisingly, there were no big changes in the outpatients" (p. 273).

Hughes (1993) evaluated a 12-week cognitive-behavioural anger management program for high-risk offenders with a history of violent offending. The purpose of the study was to evaluate the short- and long-term impact of the treatment program. Fifty-two individuals completed treatment and 27 either dropped out after one or two sessions, or decided not to participate in the treatment. These 27 individuals were used as a

comparison group and did not differ significantly from the offenders who completed the program on any of the initial psychometric assessments. A four-year follow up was conducted to look at the recidivism of the 41 individuals (treatment and comparison groups) who had been released to the community. Program participation showed no effect on general recidivism (56% of treatment vs. 69% of comparison group), but the effect on violent recidivism approached significance (40% of treatment vs. 69% of comparison group). The author concluded that individuals who completed the treatment had a lower violent recidivism rate and the length of time to rearrest was significantly longer.

The Cognitive Self Change programme of the Vermont Department of Corrections targeted attitudes, beliefs, and thinking patterns that support violent behaviour (Bush, 1995). The first two phases of this programme were institutional-based and the third was community-based. During phases I and II, offenders were oriented to the programme, identified their high-risk thinking patterns, learned techniques for controlling and disrupting these patterns, and developed relapse prevention plans for use in the community. In phase III, offenders met twice weekly for one year in community maintenance groups. Outcome data indicated a significant reduction in parole violations and rearrest for those who attended the programme for more than six months; 46% had recidivated at three years compared with 77% of the untreated group. Another evaluation of this programme found that of 55 treated offenders, 50% had a new criminal charge in a two-year follow up compared with 71% of the 141 offenders in the control group (Henning & Frueh, 1996).

In New Zealand, a residential community-based group programme for violent male offenders was developed (Polaschek & Dixon, 1997). It consisted of a series of three-month programmes for offenders on either parole or community supervision for violent convictions. The interventions were cognitive-behavioural and offenders attended up to 40 hours of structured groups per week. Thirty-three individuals completed the

programme during its first two years (1987-1989). Reconvictions over a 2.3 year follow-up were compared with conviction rates for the individuals in the two years prior to programme admission; reductions in frequency and seriousness of violent offending were found. In a five-year follow up of this group, there was "a medium reduction in general reconvictions and a large reduction in violent reconvictions for treated offenders" compared to a matched control group (Dixon & Behrnes, 1996, p. 426 cited in Polaschek & Reynolds, 2000).

Smiley et al. (1997) described the Intensive Treatment Program for Violent Offenders (ITPVO) located at the Regional Health Centre in Abbotsford, British Columbia. It was an eight-month, group-oriented program comprised of 16 offenders per group. The treatment combined cognitive-behavioural and psychosocial dynamic approaches and the therapeutic focus was on reducing skill deficits (e.g., communication, anger management). In the first follow-up study, Motiuk, Smiley, and Blanchette (1996) followed 60 treated inmates and 60 control inmates for an average of two years post-release. The groups did not differ significantly in respect to risk as measured by the Statistical Information on Recidivism scale (SIR; Nuffield, 1982), years in custody, age at release, or sentence length. The authors reported that the groups' post-release recidivism rates did not differ significantly. Forty percent of the treatment group and 35% of the control group committed new offences, and 18% of the treatment group and 15% of the control group committed a new violent offence. Although Motiuk et al. (1996) claimed that the treatment program positively affected post-release violent behaviour, they cautioned that more research was required "before drawing hasty conclusions as to whether treatment has had any impact" (p. 12).

In a second follow-up study of ITPVO participants, Smiley et al. (1997) investigated the post-release behaviour of 132 adult male federal offenders. Most participants (105) completed treatment. The follow-up period ranged from six months to three and a half years. The only significant difference between treatment completers and

non-completers was age (completers were older). During the follow-up period, 91% of non-completers committed a new offence in comparison to 49% of completers. Unfortunately, the authors did not specify the types of offences committed by participants, thus it was unclear whether the groups differed in regard to violent reoffending.

In a third related study, Mulloy and Smiley (1996) studied 79 incarcerated adult male offenders who participated in either the Intensive Treatment Program for Sex Offenders (ITPSO; 32 offenders) or the ITPVO (47 offenders) at the Regional Health Centre in Abbotsford, BC, between 1991 and 1994. Twenty-two offenders were released following treatment (unfortunately, the authors do not differentiate violent offenders from sexual offenders). During a two-year follow-up, 12 (55%) committed some type of new offence.

Robinson (1996) conducted an analysis of Correctional Service of Canada's (CSC) cognitive skills training program. The program targeted factors such as impulsivity, interpersonal problem solving skills, and perspective taking skills using cognitive-behavioural techniques. Although not focused specifically on violence, this program targeted high-risk offenders. The participants were 379 federal male inmates assigned to a wait list and 1746 who attended treatment. The two groups did not differ significantly on most demographic (e.g., age and race) and criminal history (e.g., admission type) variables. However, the wait list control group included fewer offenders with life sentences, more nonviolent property offenders, and more offenders serving shorter sentences. Robinson (1996) used statistical controls to correct for the possible effects of these differences. Overall, 21% of participants assigned to the treatment group did not complete treatment. A minimum 12-month follow-up was conducted for each participant. In terms of total reoffending, 50% of the wait list group was returned to custody in comparison to 47% of the total treatment group (58% of the non-completers and 45% of the completers). In terms of reconvictions, 25% of the wait list group

received new convictions in comparison to 22% of the total treatment group (29% of non-completers and 20% of the completers). Differences between groups were only significant when the wait list participants were compared to the program completers. When wait list participants and program completers were divided on the basis of risk level (using a measure similar to the SIR scale) and compared on the basis of reoffending, "higher-risk offenders appeared to gain little from the program" (p. 7). In particular, program completion had no significant effect on the recidivism rates for the violent offenders most at risk (i.e., offenders with robbery convictions). Thus, although the cognitive skills program targeted high-risk offenders it had little effect on high-risk violent offenders. This is not surprising since it did not focus specifically on issues related to the reduction of violence.

Boe, Belcourt, Ishak, and Bsilis (1997) conducted a follow-up of 73 inmates who participated in the Vancouver District Violent Offender Program. This program was developed for the management of violent offenders under supervision in the community. Most (95%) of the participants had at least one violent conviction and two-thirds had convictions for supervision failures. Approximately half were classified as high or very high risk according to the SIR scale. Each participant was involved in the program sometime between January 1994 and January 1996. Intensive community supervision involved two sessions per week. The minimum follow-up time was six months. During the participants' first six-month follow-up period, 15% of participants recidivated but no new offences were committed (i.e., breaches only). Sixty-four percent of the individuals who recidivated had been rated high or very high risk on the SIR scale and 36% were scored as fair risk. The authors compared their failure rate to Motiuk et al.'s (1996) two samples. In comparison, Motiuk et al.'s (1996) recidivism rates were 17% for the treatment group (none for a new offence) and 15% for the control group (offence type not stated). Since it is unclear clear how Motiuk et al.'s (1996) control group reoffended, there is no evidence that treatment influenced recidivism.

As mentioned above, Dowden and Andrews (2000) conducted a meta-analysis of 35 studies that used violent recidivism as an outcome measure. They found an overall mean effect size of +.07 for the entire sample. This effect size breaks down into a recidivism rate of 47% for the intervention group and a 54% recidivism rate for the control group. When the intervention had some human service elements the average recidivism rate was 44% compared to an average rate of 56% for the control/comparison condition. The authors found that behavioural/social learning programs were associated with substantially larger treatment effects than those produced by non-behavioural approaches. As well, programs that targeted multiple criminogenic needs were associated with larger effect sizes, thus supporting the utility of multimodal treatment approaches. Overall, this study showed a reduction in violent recidivism following treatment for violent offenders.

Wormith and Olver (2002) looked at 93 Canadian Federal offenders admitted to a violent offender treatment program. All had a history of violent offending and were in the treatment program for an average of 6.4 months. Thirty-seven percent of the total sample did not complete treatment. Recidivism information was obtained in a four-year follow-up of the sample. Sixty-nine percent of the total sample was charged with at least one new offence, and 66% were subsequently convicted and sentenced during the follow-up period. Recidivism rates were higher for treatment noncompleters (83% vs. 61%) at all levels of risk (as identified by the SIR). The authors noted that the difference between those who did and did not complete treatment was accounted for by differences in the individuals' risk level. They stated that "one cannot conclude that failure to complete the program per se caused an increase in the recidivism rate . . . . it is the noncompleters' heightened risk level that puts them particularly at risk for recidivism" (p. 466).

The Program for the Aggressive Mentally Ill Offender (PAMIO), a multimodal treatment program consisting of biological and psychosocial interventions, was developed by the Texas Department of Criminal Justice (Wang, Owens, Long, Diamond, & Smith,

2000). Cognitive-behavioural therapeutic techniques such as cognitive restructuring were used. Offenders typically received treatment for 18 months and received follow-up treatment after completing the regular program. Wang et al. (2000) selected a random sample of offenders from the 2362 who had completed the PAMIO program prior to April 1998. They excluded individuals who had left the Texas Department of Criminal Justice, who did not have at least one year of time served prior to and following PAMIO treatment, and who had more than two years difference in time served pre- versus post-PAMIO treatment. The final sample consisted of 66 individuals who were considered life-course-persistent offenders. Information on individuals' total number of disciplinary offences, good time lost (due to disciplinary infractions), and time served prior to and following PAMIO was collected. The authors found that the median annual rates of total disciplinary problems dropped from 12.1 prior to PAMIO treatment to 3.5 subsequent to treatment. Assaults of staff dropped from 0.9 to 0.0, and assaults of inmates dropped from 0.7 to 0.0 following treatment. Good time lost dropped from 311 days lost per year prior to treatment to 7 days lost per year after treatment. The decreases in the annual rates prior to and following treatment were significant for total disciplinary problems, staff assaults, inmate assaults, and good time lost.

The variability among these studies makes it difficult to draw firm conclusions. Different definitions of failure were used (e.g., reconviction vs. return to custody) and violence-specific recidivism data were rarely reported. It was also unclear whether the various treatment programs satisfied the Risk, Needs, and Responsivity principles. The composition of the study samples also varied (e.g., violent offenders only vs. violent and sexual offenders vs. general high risk offenders). However, it appears that participants who completed treatment reoffended less than treatment dropouts or control group participants, which suggested that there was some type of effective component(s) to the treatment programs.

Self-report questionnaires as outcome measures. Stewart (1985) evaluated repeat violent offenders who were incarcerated in a California medical facility. Twenty adult male offenders completed a group psychotherapy program and were compared to 21 wait list control group members. Unfortunately, a full description of the group psychotherapy program was not given. Individuals completed self-report measures related to hostility, tolerance, and likelihood of engaging in violence. Individuals who successfully completed the program had test scores that were interpreted to mean a lower probability of perpetrating violent behaviour than the control group. However, the successful completers did not score in a manner suggestive of greater tolerance of others. The author concluded that this six-month psychotherapy program might have been more successful at altering dysfunctional behaviour than the underlying attitudes and beliefs.

Rokach (1987) compared the pre- and post-treatment scores for 51 treatment group and 44 control group offenders. All of the participants were judged to be angry and aggressive and the control group was comprised of individuals who were referred for treatment but not included because of lack of space or a short time remaining in their sentence. At pre- and post-treatment, all of the participants completed the Novaco Anger Scale (Novaco, 1979) and the Test of Social Insight (TSI; Cassel, 1963). The treatment program was offered in a group setting. The first two phases included cognitive structuring and coping skills training, and were conducted in 1.5 hour, biweekly sessions over an eight-week period. At post-treatment, all participants and their case managers were interviewed regarding anger control, behaviour with peers and correctional officers, and self-perceptions. The third phase of evaluation and readjustment focused on generalization of coping skills to more "real-life" scenarios. Significant differences were found between the treatment and control groups' scores on the Novaco Anger Scale and the TSI. The individuals who completed treatment reported less anger in provocative situations, less aggression, hostility, passivity and withdrawal, and more co-operation. During interviews the case managers of control group individuals reported minimal

change in behaviour. However, case managers of those who participated in treatment reported that the offenders were less impulsive, more co-operative, not as hostile, and better able to express anger in an appropriate manner than before treatment. The treatment participants also reported increased self-control, improved anger regulation, and increased co-operation. Both the case managers and the treatment completers reported a decrease in verbal and physical aggression following treatment. The author concluded that this treatment program was effective in addressing the factors that contributed to the instigation and maintenance of aggression, while also providing participants with alternative ways of responding to others.

Hunter (1993) used changes on self-report questionnaires from pre- to post-treatment as a measure of change in violent offenders. The treatment program was a 10-week anger management program for inmates who had a propensity of acting out violently against other people and/or property. The treatment entailed an anger log, relaxation training, stress management, conflict resolution, and examining cognitive distortions. The sample consisted of 28 treatment and 27 control individuals. All participants were asked to complete the following self-report questionnaires at approximately the same time: Basic Personality Inventory (BPI; Jackson, 1989), State-Trait Anger Scale (Spielberger, Jacobs, Russell, & Crane, 1983), Buss-Durkee Hostility Inventory (B-DHI; Buss & Durkee, 1957), Marlow-Crowne Social Desirability Scale (Crowne & Marlowe, 1960), and the Personality Research Form E (Jackson, 1984). Information on participants' institutional behaviour was obtained from inmate files for two months prior to treatment and two months following treatment. When the differences between the amount and type of change on the outcome variables were compared for the treatment and control groups, the treatment group's scores on the BPI scales for impulsiveness, depression, and interpersonal problems, the assault scale of the B-DHI, and number of times an individual was charged for verbal assaults against staff were significantly lower. For the treatment group, verbal assaults of staff reduced from

eight charges in the two months prior to treatment to one charge in the two months following treatment. The author concluded that this cognitive-behavioural anger management program reduced violent offenders' violent ideation, behaviour, and pathological personality traits.

Serin and Kuriychuk (1994) evaluated the treatment gains, as measured by self-report questionnaires, of offenders who completed a 12 to 16 session cognitive behavioural anger control program. The self-report questionnaires were unspecified tests of assertiveness, empathy, anger knowledge, aggressiveness, and hostility. The sessions were a half-day each and held twice weekly. On average, participants reported ½ SD gains in assertiveness (40% of individuals), empathy (35% of individuals), anger knowledge (70% of individuals), reduced aggressiveness (30% of individuals) and reduced hostility (38% of individuals). The authors pointed out that these improvements "are encouraging, but weak in that they are determined strictly from self-reports" (p. 438).

Watt and Howells (1999) conducted two studies to evaluate the effectiveness of a Skills Training for Aggression Control (STAC) program for adult male offenders in Western Australia. The STAC program involved 10 two-hour sessions over five weeks focusing on cognitive skills, relaxation, social skills, problem-solving, and relapse prevention. In the first study, 25 individuals were selected to be in the treatment group; 18 of these individuals completed the program. Non-completers included individuals who were released, in court, or did not attend. Fourteen offenders who were on the waiting list for the program were used as the control group. At pre- and post-treatment both groups were given the State-Trait Anger Expression Inventory (STAXI; Spielberger, 1991), the Novaco Anger Scale (NAS; Novaco, 1994), and the Watt Anger Knowledge Scale (WAKS; designed by the first author for this study). No improvement in anger knowledge, or decrease in self-reported anger experience and expression was found for the treatment group when compared to the control group. A second study was designed to address limitations of the first study. In study two, the NAS was modified to be more

sensitive to changes over time, the STAXI was used to differentiate individuals as having high or low trait anger at pre-treatment only, and the Modified Overt Aggression Scale (MOAS; Kay, Wolkenfield, & Murrill, 1988) was added to assess participants' aggressive behaviour in prison. The hypothesis was that individuals with high trait anger would have differential change due to the treatment program than the low trait anger group. Thirty-eight individuals completed pre- and post-testing on the NAS, WAKS, and MOAS, and incident reports were obtained for each person for a one-month period prior to the pre- and post-treatment testing. Results did not support the hypothesis; individuals with high trait anger did not score differently from pre- to post-treatment when compared to the control group. Comparisons between the treatment and control groups on aggression, as measured by the MOAS, and frequency of incident reports indicated no significant effects on the behavioural measures. The authors suggested that this lack of difference might be due to the low frequency of incidents on both measures. The authors pointed out that the negative results of these two studies are inconsistent with previous anger management program evaluations, and suggested that the current results may be due to methodological problems such as low motivation of participants and insufficient program time (five weeks).

Several authors have urged caution when interpreting self-report data. Hughes (1993) cautioned that change as measured by self-report questionnaires might not be entirely trustworthy due to the fact that offenders have "many reasons for professing a change in how they feel, and how they would behave hypothetically, after completion of the program" (p. 7). According to Serin (1994), self-report measures "may be an insufficient measure of treatment gain given the demand characteristics, the reality that intervention is often accepted under duress, and where less than favorable post-treatment reports have significant negative consequences" (p. 8).

Conclusions from Treatment Literature

Dowden and Andrews' (2000) meta-analysis provided evidence that programs that adhere to the Risk, Needs, and Responsivity principles had greater mean effect sizes for reduction in violence. However, the weaknesses in specific studies (e.g., incomplete reporting of recidivism rates) make this conclusion difficult to discern at times. In general, treatment has led to decreases in community recidivism (both violent and total) and to reducing institutional misconduct. Sole reliance on psychological testing is not recommended but test results may prove to be useful adjuncts to recidivism in evaluating the effectiveness of programming.

Hard-to-Treat Populations within the Prison System

Dowden and Andrews' (2000) results can be interpreted as support to follow Serin and Brown's (1996) advice to focus on Andrews' (1989) Responsivity principle. Responsivity factors such as motivation (or readiness for change) and psychopathy require further investigation to ensure that program delivery matches the styles and abilities of offenders in order to increase participation rates and treatment effectiveness.

Offenders described as treatment resistant often have diagnoses such as borderline personality disorder and psychopathy[2]. These clients share a number of common characteristics: low motivation for treatment, non-compliance during treatment, high rates of treatment drop-out, few positive behavioural changes, and higher recidivism rates after treatment (Preston & Murphy, 1997). The first characteristic is a responsivity factor, and the remainder are behaviours one would expect after violating the Responsivity principle.

Psychopathy and violence. Psychopathy is a chronic personality disorder described by a constellation of affective, interpersonal, and behavioural traits (Hare,

[2] Some authors (e.g., Leone, 2001) pointed out that "psychopathy" was a pejorative term used to discriminate against others who violated social norms. Other authors (e.g., Gresham, 2001) admitted that this was a concern, but also pointed out that the diagnosis was useful in terms of describing a group of individuals that have specific behavioural and affective characteristics. It is very important that researchers and clinicians use a widely accepted definition and measure of psychopathy in order to avoid futher complicating this concept.

1991). Affectively, the psychopath displays only shallow emotions, lacks genuine empathy, remorse, or anxiety, and is unable to form lasting relational bonds with others. Interpersonally, the psychopath is glib, grandiose, manipulative, deceitful, irresponsible, egocentric, and cold hearted. Behaviourally, the psychopath is impulsive and sensation seeking and tends to violate social norms, which results in frequent contact with the criminal justice system.

Previous criticism that this construct was too elusive to measure (e.g., Gunn, 1978) was resolved with the development of the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 1991). In contrast with older standardised measures such as the Millon Clinical Multiaxial Inventory-2 (Millon, 1987) and the Minnesota Multiphasic Personality Inventory-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) that only tapped the behavioural characteristics (e.g., Sullivan, Dawda, Dempster, Smiley, & Mulloy, 1996), both personality traits and behaviours can be reliably and validly measured using the PCL-R.

As both Serin and Brown (1996) and Preston and Murphy (1997) noted, psychopathy was an important clinical factor to consider when providing treatment services to violent offenders. In addition to presenting as violent and resistant, psychopaths comprise approximately 20% of the prison population (Hare, 1993). In their study of 227 federal inmates, Hare and McPherson (1984) reported that offenders who scored high on the 22-item Psychopathy Checklist (PCL) were significantly more likely to have been convicted for violent crimes in the past. Significance remained even after items relating to violence were deleted from the PCL scores. Serin (1991) found that in a sample of 87 federal inmates, psychopaths (as defined by the PCL) were significantly more likely than nonpsychopaths to have incurred past violent convictions and behaved violently in the past (e.g., weapons use, uttering threats).

There is a relationship between psychopathy and violent recidivism. Harris, Rice, and Cormier (1991) conducted a follow-up of 169 adult male mentally disordered

offenders after their release from a maximum-security psychiatric hospital. PCL scores were related significantly to violent recidivism; 77% of psychopaths recidivated violently as compared to 21% of nonpsychopaths.

Rice, Harris, and Cormier (1992) and Harris, Rice, and Cormier (1994) reported long-term recidivism data for participants from the Social Therapy Unit (STU) in the maximum security hospital at Penetanguishene, Ontario. The participants were in treatment between 1968 and 1978, and several aspects of the program clearly violated the Risk, Needs, and Responsivity principles (e.g., nude encounter groups, little vocational training, participation was not voluntary, use of psychedelics). STU was evaluated by comparing a treatment group and non-treatment group matched for pre-treatment risk for crime, age, index offence, criminal history, and length of follow-up, and official criminal records were used to determine recidivism. File-only PCL-R ratings were completed to assess psychopathy. Rice et al. (1992) reported that "overall, the results showed no effect of the therapeutic community in reducing recidivism" (p. 407). For general recidivism, 87% of treated psychopaths and 90% of untreated psychopaths failed (44% and 58% of nonpsychopaths failed, respectively), and for violent recidivism, approximately 77% of treated and 55% of untreated psychopaths failed (22% and 39% of nonpsychopaths failed, respectively). Given the outdated treatment methods, the lack of impact on recidivism was not surprising.

Salekin, Rogers, and Sewell (1996) conducted a meta-analysis of 15 studies that investigated the relationship between psychopathy (as measured by the PCL, PCL-R, or PCL-SV) and violent recidivism or institutional violence. The authors reported that the mean effect size for 15 studies was .79, with a range from .42 to 1.92, indicating that there is a modest relationship between psychopathy and violence. Furthermore, the importance of psychopathy as a risk factor for violence is recognised in prediction measures such as the Violence Risk Appraisal Guide (Harris, Rice, & Quinsey, 1993) and the HCR-20 (Webster, Eaves, Douglas, & Wintrup, 1995).

The connection between psychopathy and future violence is important for another reason. In a cross-sectional analysis of 35 psychopaths and 47 nonpsychopaths ranging in age from 16 to 50, Hare, Forth, and Strachan (1992) found that psychopaths were violent and aggressive across the life span. Thus, psychopaths are likely to be incarcerated for violent behaviour well into their 50's, making them a long-term concern for correctional services.

The treatment literature regarding psychopaths is negative; comments that psychopaths are not responsive to treatment abound (e.g., Coid, 1998). Both group- and individually-oriented treatments have been considered ineffective with psychopaths (e.g., Cox, 1998; Kernberg, 1998), while the therapist's main role has been to "endure repeated disappointments" (Glover, 1960, cited in Cox, 1998, p. 399). Hansen (1998) provided an insightful quote from Strup's (1968) memoirs regarding the treatment of psychopaths at the Danish detention centre Herstedvester: "I never say that I cure psychopaths; I do claim, however, that during their stay in Herstedvester they have been helped to become nicer psychopaths" (p. 460). Treatment with psychopaths is so fraught with difficulty that some authors avoid the issue altogether (e.g., Dolan, 1998). Coid (1998) recommended secure incarceration as the only avenue to reduce psychopaths' risk for violence.

It is possible that the lack of treatment success with psychopaths is due in part to biological factors. Hare (1998) hypothesised that functional and/or structural neural deficits might be responsible for psychopaths' callousness through interference with cognitive and affective processes. This marks psychopathy as a responsivity factor; treatment programs require modification for use with psychopathic clients just as they would be modified for offenders who were brain injured or deaf. Hare's (1998) concern was that violent psychopaths would be warehoused (as per Coid's [1998] suggestion) rather than treated. Hare (1998) encouraged the development of innovative programs and to discover new ways to motivate psychopaths to become more prosocial. Thus, the issue returns to motivating difficult clients.

Andrews and Hoge's (1995) proposal may have influenced Hare's (1998) thinking. They denounced the practise of excluding participants from treatment on the basis of weak motivation and resistance to therapy. Instead, motivation should be treated as a dynamic responsivity factor and treatment programs should be developed to support treatment participation and increase motivation for treatment (Andrews & Hoge, 1995; Kennedy, 2000; Serin, 1998). Unfortunately, motivation for treatment is a difficult concept to operationalise. Many researchers advocated for the development of a standardised measure of motivation that was psychometrically sound and relevant theoretically and clinically (e.g., Kennedy, 2000; McMurran, Tyler, Hogue, Cooper, Dunseath, & McDaid, 1998; Preston & Murphy, 1997).

According to Serin and Kennedy (1997), Prochaska's Transtheoretical Model of Change (TTM) highlighted "the importance of treatment readiness and is consistent with the responsivity principle" (p. 6). Likewise, Wormith (2001) stated that the TTM might be most relevant to offender responsivity.

The Transtheoretical Model Of Change

There is general agreement among therapists that motivation to change is an important precondition for therapy to succeed (Heather, 1992; Prochaska & DiClemente, 1982). Although there are other factors that are related to therapeutic success, the discussion of these factors is outside the scope of the current study. "Lack of motivation is one of the most frequently cited reasons for patient dropout, failure to comply, relapse, and other negative treatment outcomes" (Ryan, Plant, & O'Malley, 1995, p. 279). Therapists in health-related fields stand out as viewing motivation as a dynamic rather than a static, all-or-nothing phenomenon (e.g., Annis, Schober, & Kelly, 1996).

Horn and Waingrow (1966) suggested there were four steps for engaging in self-protective health behaviour: awareness of a threat, identifying the threat as important, deciding the threat was personally relevant, and deciding to act against the threat. "Although all of these appear to be necessary conditions for self-protective action, the

absence of any *one* can serve to inhibit action" (p. 22, italics in original). Thus, the authors put forward the notion that substantial cognitive work precedes behavioural change, and that each step is necessary but not sufficient for successful change to occur. Horn (1976) refined this theorizing and renamed the four steps as contemplation of change, the decision to change, short-term change, and long-term change. DiClemente and Prochaska (1982) integrated Horn's (1976) seminal work with Prochaska's (1979) efforts to discover the therapeutic elements common among different schools of psychotherapy. This integration resulted in the nucleus of the Transtheoretical Model of Change (TTM).

In their study, DiClemente and Prochaska (1982) hypothesised that cigarette smokers attempting to quit moved through three stages towards successful abstinence: deciding to change, active change, and maintenance of change. The authors compared 29 smokers who attempted to change without professional assistance with two groups who tried to quite smoking using structured programs (18 smokers in aversion therapy and 16 in behaviour management). The groups did not differ in regard to relevant demographic variables or smoking history. Overall, the rates of abstinence and relapse were similar across the three groups. The authors discovered that participants reported that verbal processes (e.g., education) were more useful during the deciding to quit stage while behavioural processes (e.g., stimulus control) were more effective during the second and third stages. Thus, individuals attempting to change behaviours moved through a series of stages and found different intervention techniques more effective at different stages.

The TTM is a theory of behavioural change that describes individuals' progression through a series of six stages of change (Precontemplation, Contemplation, Preparation, Action, Maintenance, and Termination), ranging from when no behavioural change is contemplated to when long-term change has been fully integrated into the individual's lifestyle (Prochaska & Norcross, 1994). Different therapeutic techniques (i.e., the processes of change) are most effective within different stages (Prochaska &

Norcross, 1994). One major advantage of the TTM is that it provided guidelines regarding when, how, and where different therapeutic techniques can be applied to assist clients to change (Rossi, Rossi, Velicer, & Prochaska, 1995). Put more simply, it is "doing the right thing at the right time" (DiClemente & Prochaska, 1998, p. 10).

Major Components of the TTM

Stages of Change

The central construct of the TTM is the stages of change. The stages represent the "when" of change (Prochaska & Norcross, 1994), and "are a way of segmenting the process into meaningful steps consisting of specific tasks required to achieve successful, sustained behavior change" (DiClemente & Prochaska, 1998, p. 4). The current version of the TTM includes six stages: Precontemplation, Contemplation, Preparation, Action, Maintenance, and Termination. Progression through the stages is cyclical rather than linear in nature, since relapsing and having to repeat some stages on the way to successful Termination appears to be the norm (DiClemente & Hughes, 1990; DiClemente & Prochaska, 1998).

Precontemplation represents the stage in which the individual is either unaware of the problem or is ignoring it (DiClemente, 1993; McConnaughy, Prochaska, & Velicer, 1983). The individual may be honestly uninformed about the problem or actively resist being informed (Prochaska & DiClemente, 1982). Individuals entering therapy at the Precontemplation stage are often pressured into attending or are focused on changing the environment or others rather than themselves (McConnaughy, DiClemente, Prochaska, & Velicer, 1989). At this stage, the individual perceives that the costs of changing behaviour far outweigh the benefits (Prochaska, Velicer, Rossi, Goldstein, Marcus, Rakowsi, et al., 1994).

Contemplation involves the client becoming aware that the problem exists or experiencing discomfort associated with the problem (McConnaughy et al., 1989, McConnaughy et al., 1983). The individual wants to change and begins to consider

changing (DiClemente, 1993). At this stage, the costs and benefits of maintaining the problem behaviour are seen to be nearly equal (DiClemente & Prochaska, 1998; Prochaska, Norcross, & DiClemente, 1994). The client begins to seek information and feedback about the problem (Redding, Prochaska, Pallonen, Rossi, Velicer, Rossi, et al., 1999). This appears similar to Horn's (1976) contemplation of change stage.

The Preparation stage represents the culmination of the individual's decision-making process that began in the Contemplation stage (DiClemente & Prochaska, 1998). At this point, the costs of the negative behaviour clearly outweigh its benefits, so the individual makes a firm decision to change (DiClemente, 1993; McConnaughy et al., 1983). However, the individual has either not yet started to make changes to the problem behaviour or has only made small changes (Redding et al., 1999). For individuals who have attempted change in the past and failed, the Preparation stage marks a return to the change attempt. This stage is similar to Horn's (1976) decision to change stage.

In the Action stage, the individual has started to change the problem behaviour. In other words, the Action stage involves the implementation of the plan developed in the Preparation stage (DiClemente, 1993). However, the desired level of change has not yet been achieved (McConnaughy et al., 1983). This is similar to Horn's (1976) third stage, short-term change. Individuals in the Action stage will often seek help from others in order to implement change strategies (McConnaughy et al., 1989). Relapse rates are quite high in this stage as the behaviour change is still new and difficult to sustain (Redding et al., 1999).

During the Maintenance stage, the individual has been successful in making the desired behaviour change (McConnaughy et al., 1983). At this stage, the individual seeks to consolidate his or her gains (McConnaughy et al., 1989). The effort now becomes focused on integrating the behaviour change into the individual's everyday lifestyle (DiClemente, 1993; DiClemente & Prochaska, 1998). This is similar to Horn's final

stage, long-term change. The risk of relapse is lower because the behaviour change is now more habitual, but relapse prevention still requires attention (Redding et al., 1999).

Termination is the final stage. Change has now become completely integrated into the individual's lifestyle (DiClemente & Prochaska, 1998). The individual is 100% confident that he or she can resist the temptation to engage in the problematic behaviour.

There are two main methods of measuring the stages of change. The first is the use of a stage algorithm, in which participants are assigned to discrete stages of change based on their responses to a series of four or five questions asked by an interviewer related to when (or if) the participants were planning on changing the behaviour in question (Carey, Purnine, Maisto, & Carey, 1999). Some questions for smoking include "are you planning to quit smoking in the next 30 days" and "are you contemplating quitting smoking in the next six months" (Farkas, Pierce, Zhu, Rosbrook, Gilpin, Berry, & Kaplan, 1996). The second is the University of Rhode Island Change Assessment scale (URICA; McConnaughy et al., 1983), which is a self-administered 32-item questionnaire designed to measure four stages of change: Precontemplation, Contemplation, Action, and Maintenance. The URICA will be discussed in greater depth in a later section.

While the stages of change make conceptual sense, it was important to show that movement in participants' stages of change occurred over time. Prochaska, Velicer, Guadagnoli, Rossi, and DiClemente (1991) used the stage-based algorithm to assess 544 adult smokers over a two-year period (reassessing every six months). Three main types of stage movement patterns were identified: flat (i.e., no change in stage during the follow-up period), unstable (both regressions and progressions in stage membership), and linear change (i.e., either progression or regression through stages). In a follow-up study, Norman, Velicer, Fava, and Prochaska (1998) administered the stage algorithm to 2088 smokers and followed them up at six-month periods over two years. Participants' stages were tracked over the time period, and were used to differentiate participants into progressing, regressing, or stable movement. According to the authors' results, 44% of

participants were stable (i.e., remained at the same stage over the two-year period), 17% were regressors (backward movement of at least one stage), and 39% were progressors (forward movement of at least one stage). DiClemente (1999) administered the stage algorithm to 300 adult smokers over five sequential six-month periods. Forty-six percent of participants showed a progression in their stage membership, 31% of participants showed no change in stage, and 23% regressed to a less advanced stage of change. Thus, it is clear that changes in stage membership occur over time.

Processes of Change

After the stages of change, the processes of change are the most important component of the TTM. They have been described as "the engines that facilitate movement through the stages of change" (DiClemente & Prochaska, 1998, p. 4) or the 'how' of behavioural change (Prochaska & Norcross, 1994). According to Horn (1976), different cessation procedures were more appropriate for some clients than others. DiClemente and Prochaska's (1982) study of people attempting to quit smoking addressed the issue of processes of change. In that study, participants in earlier stages of change found verbal techniques to be helpful, while participants in later stages of change reported behavioural techniques to be effective. Other researchers have shown that while awareness must precede change and is necessary to help the client plan for needed changes, it is not equivalent to change (Wachtel, 1991) as *in vivo* experience is the second necessary component (Goldfried, 1991). These accounts matched with the processes of change; verbally-oriented processes (e.g., insight) prepare clients for action, and behaviourally-oriented processes (e.g., in vivo experiences) help clients to consolidate change.

The processes of change have been "mapped" onto the stages of change (e.g., DiClemente, Prochaska, Fairhurst, Velicer, Velasquez, & Rossi, 1991). The processes are initially verbally- or insight-oriented. During the Precontemplation stage, individuals use fewer processes than at any other stage; for example, they collect less information and

spend less time re-evaluating themselves (Prochaska & DiClemente, 1986). Clients in the Contemplation stage are most likely to use consciousness-raising techniques (e.g., bibliotherapy, observations), confront their feelings about the problem (i.e., dramatic relief) and to re-evaluate themselves and their environment to find triggers for their problem behaviour (Prochaska & DiClemente, 1986; Redding et al., 1999). During the Preparation stage, clients need to act from a sense of self-liberation, which is a "need to believe that they have the autonomy to change their lives in key ways" (Prochaska & DiClemente, 1986, p. 10). In the Action and Maintenance stages, clients make more use of behavioural techniques, including contingency management, counter conditioning, and stimulus control (Prochaska & Norcross, 1994). When the processes of change are matched to the stages of change in this manner, the term "stage-matched interventions" is appropriate.

Levels of Change

The levels of change are the third and least studied of the basic TTM constructs (DiClemente & Prochaska, 1998). The levels can be interpreted as the 'what' of behavioural change (Prochaska & Norcross, 1994). There are five levels (in descending order): symptom/situational, maladaptive cognitions, interpersonal conflicts, family/systems conflicts, and intrapersonal conflicts (Prochaska & DiClemente, 1986). These levels are meant to reflect that problem behaviours occur "in the context of complex, interrelated levels of human functioning" (Prochaska & Norcross, 1994, p. 470). Initial interventions tend to occur at the symptom/situational level since this is the most conscious level and change typically occurs more quickly. The further down the levels one moves, the less likely one is aware of the determinants of problem behaviour and "the further back in history are the determinants of the problem and the more interrelated the problem is with the sense of self" (Prochaska & DiClemente, 1986, p. 18). The levels are hypothesised to be interrelated insofar as change at one level is likely to produce some degree of change at other levels (Prochaska & DiClemente, 1986).

In summary, the TTM approach promotes treatment as the differential application of therapeutic techniques (the processes of change) at the correct time (the stages of change) on the most appropriate problem (levels of change) (Prochaska & DiClemente, 1986).

Profiles of Change

While the stages of change are relatively simple theoretical concepts, they may not reflect reality accurately. The stages may only represent a convenient form of clinical shorthand. In an attempt to capture real-world diversity, McConnaughy et al. (1983) developed a self-administered stages of change questionnaire. The authors generated 165 items from the theoretical basis of the stages of change. Each item was rated on a five-point Likert scale (1 = strongly agree to 5 = strongly disagree). Items were analysed using principal components analysis that produced a four-factor, 32-item measure named the University of Rhode Island Change Assessment scale (URICA). The four factors were interpreted as being equivalent to the Precontemplation, Contemplation, Action, and Maintenance stages. In order to reduce confusion, the term 'stages' will be used throughout this document to refer to the statistically derived subscales of the URICA. Each stage was composed of eight items. The Preparation stage was dropped because its items loaded on either the Action or Contemplation stages during factor analyses. The URICA was then administered to 155 adult psychotherapy outpatients (99 women and 53 men). The authors discovered that clients endorsed some items that were relevant to other stages in addition to items relevant to their current stage. In other words, "rather than simply being in one stage or another, clients show patterns of differential involvement in each of the stages" (p. 374). Movement from one stage to the next actually involved fluctuations in involvement at every stage (McConnaughy et al., 1989).

Unfortunately, the URICA has been used in ways not endorsed by its developers. Rossi et al. (1995) commented on the proper use of the URICA:

> The URICA has occasionally been used to place individuals into one of the discrete stages of change, for example, by identifying the scale on which an individual scores highest (e.g., Prochaska, Norcross, et al., 1992). The motivation to do this is understandable, but the practice is not well justified from a measurement point of view and should be discouraged. The primary purpose of the URICA is to identify specific stage profiles (typologies) characteristic of transitions between the four basic stages of change . . . . Use of the URICA for identifying stage-specific typologies . . . generally requires the use of cluster analysis with fairly large sample sizes (e.g., 150 - 250) and the use of standardized scoring. (pp. 393 - 394)

Although this may seem to be a trivial issue, the misuse of the URICA is widespread. Many researchers have placed participants into stages based upon their highest URICA mean score (e.g., Derisley & Reynolds, 2002; Franko, 1997; Ginsburg, 2000). In Rosen's (2000) review of studies related to the processes of change, he noted that almost 60% of studies using the URICA placed participants into stages based on their highest stage score.

Using a hierarchical clustering procedure, McConnaughy et al. (1983) produced nine cluster profiles that captured 140 (90%) of the participants:

The Reluctance profile (Precontemplation-average, Contemplation-average, Action-well below average, and Maintenance-below average) was composed of five (3.2%) participants who were described as "reluctant to take action on a problem, although there is a sense that they might be thinking about it. However, there is no commitment to change" (p. 373).

The Immotive profile (Precontemplation-average, Contemplation-below average, Action-below average, and Maintenance-average) accounted for 13 (8.4%) participants that were described as "not contemplating change, nor are they engaged in changing; rather they are maintaining the status quo" (p. 373).

The Uninvolved profile (Precontemplation-average, Contemplation-average, Action-below average, and Maintenance-below average) included 15

(9.7%) participants who "are not ignoring (nor are they thinking about) their problems" (p. 373).

The Non-reflective Action profile (Precontemplation-well above average, Contemplation-below average, Action-above average, and Maintenance-average). These six (3.9%) participants were "taking action while not acknowledging that a problem exists" (p. 373).

The Non-contemplative Action profile (Precontemplation-average, Contemplation-below average, Action-average, and Maintenance-below average) consisted of 14 (9.0%) participants. They were "not thinking about changing, nor are they maintaining any changes they may have made previously" (p. 372).

The Decision-making profile (Precontemplation-below average, Contemplation-above average, Action-above average, and Maintenance-below average) was composed of 20 (12.9%) participants that were "still contemplating their problems but have begun to take action" (p. 371).

The Pre-participation profile (Precontemplation-average, Contemplation-above average, Action-above average, and Maintenance-above average) accounted for 27 (17.4%) participants who were described as "somewhat involved in thinking about, acting on, and maintaining changes, and tend not to ignore the existence of the problem" (p. 372).

The Participation profile (Precontemplation-below average, Contemplation-above average, Action-above average, and Maintenance-above average) included 13 (8.4%) participants. They were "engaged in thinking about the problem, taking some action on changing it, and maintaining changes already made" (p. 372).

The Maintenance profile (Precontemplation-average, Contemplation-average, Action-average, and Maintenance-above average) consisted of 27

(17.4%) participants who were "maintaining previous improvements, and tend not to be involved in rethinking or taking new action" (p. 372).

To make rough comparisons, the Reluctance, Immotive, and Uninvolved profiles were similar to the Precontemplation stage, the Decision-making profile was similar to the Preparation stage, the Pre-participation profile was a mixture of the Preparation and Action stages, the Participation profile resembled the Action stage, and the Maintenance profile was similar to the Maintenance stage. There was no profile consistent with the Contemplation stage, and the Non-reflective and Non-contemplative profiles appeared to represent individuals who may only be paying lip service to change (i.e., Precontemplators masquerading as Action-oriented persons).

McConnaughy et al. (1989) replicated their earlier study with 327 adult outpatients (166 women and 155 men) who were receiving treatment from a state psychiatric facility. Correlational analysis indicated that the Precontemplation stage correlated negatively with the other three stages (Contemplation, Action, and Maintenance), which in turn correlated positively with each other. Using a hierarchical agglomerative clustering procedure, the authors produced eight cluster profiles that accounted for 293 (90%) participants:

> The Precontemplation profile (Precontemplation-above average, Contemplation-well below average, Action-well below average, and Maintenance-well below average) accounted for 18 (5.5%) participants and was translated as indicating "a reluctance to change" (p. 498).
>
> The Immotive profile (Precontemplation-above average, Contemplation-below average, Action-below average, and Maintenance-average) included 41 (12.5%) participants who "are not contemplating change, nor are they engaged in changing; rather, they seem to be maintaining the status quo" (p. 498).
>
> The Uninvolved profile (Precontemplation-average, Contemplation-average, Action-average, and Maintenance-average) consisted of 70 (21.4%)

participants who "demonstrate the lack of an action component to their profile. Meanwhile, they are not ignoring (nor are they thinking about) their problem" (p. 499).

The Discouraged profile (Precontemplation-average, Contemplation-average, Action-average, and Maintenance-well below average) was 35 (10.7%) participants who "are not thinking about changing in new ways, nor are they working to maintain any changes they may have made previously" (p. 499).

The Contemplation profile (Precontemplation-below average, Contemplation-above average, Action-well below average, and Maintenance-average) was composed of 27 (8.3%) participants who "are thinking about changing but have not begun to take action on the problem" (p. 500).

The Decisionmaking profile (Precontemplation-below average, Contemplation-above average, Action-above average, and Maintenance-below average) accounted for 44 (13.5%) participants and was described as "an involvement in thinking and taking action on the identified problem" (P. 498).

The Participation profile (Precontemplation-below average, Contemplation-above average, Action-above average, and Maintenance-above average) included 33 (10.1%) participants who were "reporting involvement in changing" (p. 498).

The Maintenance profile (Precontemplation-above average, Contemplation-above average, Action-above average, and Maintenance-above average) consisted of 25 (7.6%) participants who were "maintaining previous behaviours" (p. 498).

To make general comparisons, the Precontemplation, Immotive, Uninvolved, and Discouraged profiles were similar to the Precontemplation stage, the Contemplation profile appeared similar to the Contemplation stage, the Decisionmaking profile was

similar to the Preparation stage, the Participation profile resembled the Action stage, and the Maintenance profile was similar to the Maintenance stage.

DiClemente and Hughes (1990) addressed the issue of validity by studying how well the profile clusters reflected attitudes not directly tapped by the URICA. They administered the URICA to 224 participants from a Texas outpatient alcoholism treatment program. In addition to the URICA, participants completed several alcoholism and self-efficacy questionnaires. Every participant fit into one of five cluster profiles:

> The Precontemplation profile (Precontemplation-above average, Contemplation-well below average, Action-below average, and Maintenance-below average) accounted for 28% of the participants.
>
> The Ambivalent profile (Precontemplation-well above average, Contemplation-average, Action-average, and Maintenance- above average) included 13% of participants.
>
> The Uninvolved/discouraged profile (Precontemplation- below average, Contemplation-below average, Action- well below average, and Maintenance-well below average) was composed of 12% of the participants.
>
> The Contemplation profile (Precontemplation-below average, Contemplation-above average, Action-below average, and Maintenance-average) included 24% of the participants.
>
> The Participation profile (Precontemplation- below average, Contemplation-above average, Action-above average, and Maintenance-above average) accounted for 23% of the participants.

The Precontemplation group drank as much as the other groups but denied having an alcohol problem. They reported low levels of anxiety about their drinking and low levels of temptation to drink. The Ambivalent group drank as much as the other groups and believed that they had little or no problem. They relied on alcohol for self-enhancement and reported low temptation to drink. The Uninvolved/discouraged group

reported feeling overwhelmed by their dependence on alcohol and reported the least control over their drinking. The Contemplation group admitted to loss of control over drinking and anxiety about their drinking but they had not sought help prior to their current treatment involvement. The Participation group admitted that they had sought help in the past, reported high levels of loss of control over drinking and high levels of anxiety related to drinking. These results suggest that certain groups (i.e., Precontemplation and Ambivalent) engaged in self-deception regarding their problems and that a feeling of being overwhelmed (Uninvolved/discouraged) may have to precede recognition of the problem behaviour (Contemplation) and seeking help (Participation).

Carney and Kivlahan (1995) sought to replicate DiClemente and Hughes' (1990) study. They administered the URICA to 404 admissions to an addictions treatment centre. The four-factor structure of the URICA was replicated. Hierarchical agglomerative cluster analyses produced four cluster profiles almost identical to DiClemente and Hughes (1990). Although an Uninvolved/discouraged profile was not generated, 30% of participants were in the Precontemplation profile, 17% were in the Contemplation profile, 22% were in the Ambivalent profile, and 31% were in the Participation profile. Participants in the Precontemplation profile were significantly less likely to admit to substance abuse on self-report measures, but each profile's averaged score on these measures was in the clinically significant range. Participants in the Participation profile were least likely to report legal pressure to attend treatment.

Willoughby and Edens (1996) administered the URICA to 141 patients prior to the beginning of treatment in a residential-based alcoholism program. They cluster analysed the URICA scores and produced two clusters they labelled Precontemplation and Contemplation/Action. The participants in the Precontemplation profile experienced significantly less worry about their alcohol use and were significantly less receptive to treatment, and the Contemplation/Action profile experienced significantly greater symptoms of anxiety and depression. The authors explained their finding of fewer

profiles as possibly due to the homogeneity of their sample (male Caucasian veterans), a smaller sample size than used in previous cluster studies, and the use of different cluster stopping rules techniques (i.e., cubic clustering criterion, pseudo-F, and pseudo-T^2). In a follow-up study (Edens & Willoughby, 1999) with 133 polysubstance abusers, the authors found the Contemplation/Action profile participants were significantly more likely to complete treatment.

Greenstein, Franklin, and McGuffin (1999) administered the URICA to 89 adolescent patients upon their admission to a private psychiatric facility. The URICA's descriptive statistics for this sample were similar to those from McConnaughy et al.'s (1983; 1989) studies. Three cluster profiles were generated through cluster analysis: Precontemplation (22%) participants reported ambivalence about acknowledging a problem; Uninvolved (58%) participants were more involved in active change than those in Precontemplation, but were not completely invested in change; and Participation (19%) participants appeared involved in both thinking about changing and actively making changes. The authors hypothesised that adolescents with externalizing disorders (e.g., conduct disorder) would be more likely to be from cluster profiles indicative of less readiness to change, and adolescents with internalizing disorders (e.g., depression) would be in cluster profiles indicative of greater readiness for change. The data did not support the hypothesis, but the authors encouraged other researchers "to explore further the relationship between diagnosis and cluster membership to determine if particular diagnostic groups are more or less likely to be motivated to change" (p. 54).

Although the number of cluster profiles generated varied across studies, there was similarity in regard to the content of the cluster profiles. Several different cluster profiles related to the Precontemplation stage typically appeared, and Decision-making and Participation cluster profiles were often found. The cluster profiles also appeared to differ in meaningful ways. Participants from less advanced profiles were less likely to

admit to having problems, whereas those from more advanced profiles admitted to having a problem and experiencing distress related to the problem.

The Relationship of Stages of Change with Treatment in Health Samples

Another important step in establishing the validity of the stages of change was to demonstrate the relationship between treatment completion and stage membership. Simpson and Joe (1993) reported that motivation for change was a significant predictor of staying in treatment for adult outpatients in a methadone maintenance program. McConnaughy, Prochaska, Velicer, and DiClemente (unpublished data, cited in Derisley & Reynolds, 2000) hypothesised that "individuals who enter therapy at the Precontemplation or Contemplation stage are less ready to initiate change and may be more likely to terminate prematurely early in treatment than persons who enter therapy at the later change stages" (pp. 372-373). This is referred to as a stage-outcome effect (Prochaska & DiClemente, 1992).

Several studies have demonstrated the relationship between treatment behaviour and the stages of change. DiClemente et al. (1991) found that stage of change (based on the stage algorithm) predicted participants' attempts to quit smoking and their level of success after one and six months. At pre-treatment there were 166 individuals in Precontemplation, 794 in Contemplation, and 506 in Preparation. Those in Preparation were significantly more likely to have made an attempt to quit in the preceding month(s) than Precontemplators at one- and six-months post-treatment (56% vs. 8%; 80% vs. 26%) or to have ceased smoking (14% vs. 2%; 21% vs. 8%).

Prochaska, Velicer, Fava, Ruggiero, Laforge, and Rossi (1997; cited in DiClemente & Prochaska, 1998) tracked smokers and found that if clients progressed through two stages their rate of taking action increased three to four times. Dijkstra, Roijackers, and DeVries (1998) assigned smokers to stages of change based on the stage algorithm. The authors found that "the higher the readiness to quit, the higher the percentages of smokers who were actively trying to quit" at a three- and fourteen-month

post-treatment follow-up. The authors noted that the predictive power of the stages decreased between three and fourteen months, and interpreted this as indicating that the relationship between intention and behaviour weakened over time.

Prochaska, Norcross, Fowler, Follick, and Abrams (1992) administered the URICA to 30 overweight hospital staff members at the beginning, middle, and end of a behavioural weight-control treatment program (weeks one, five, and ten, respectively). Contemplation stage scores decreased significantly between weeks one and five, and Action stage scores increased significantly between weeks one and five. Participants' pre-treatment Action stage scores were significant predictors of treatment attendance and number of pounds lost during treatment. Higher Action stage scores, lower Maintenance stage scores, and lower Precontemplation stage scores were associated with weight loss at end of treatment.

Pantalon and Swanson (2003) administered the URICA to 120 psychiatric and dually diagnosed adult inpatients participating in treatment for their substance abuse and psychiatric conditions (e.g., psychotic disorder, alcohol abuse). There was a significant negative correlation between the pre-treatment Maintenance stage score and the number of sessions attended during the first month post-discharge. The authors interpreted this as meaning that participants with higher Maintenance scores may have felt they could change on their own and did not require additional formal treatment.

Thus, the stages of change were found to be related to taking positive action in meaningful ways. Stage membership was a significant predictor of attempts to quit smoking, but predictive power may be time-limited (which supports the dynamic nature of readiness for change). In addition, URICA scores predicted treatment attendance and amount of weight loss.

The Relationship of Stages of Change with Treatment Completion in Psychotherapy Samples

Treatment completion (or dropout) has been an important topic in psychotherapy research. Wierzbicki and Pekarik (1993) conducted a meta-analysis of 125 psychotherapy dropout studies and reported a mean dropout rate of 47%. After examining standard demographic variables (e.g., sex, race, age, education, socio-economic status), the authors concluded that "studies that have investigated more complex variables, such as clients' intentions and expectations and client-therapist interactions, have found them to be far more powerfully related to dropout than simple client and therapist variables" (p. 194). After reviewing the factors related to the duration and outcome of psychotherapy, Steenbarger (1994) concluded that the duration—outcome relationship was mediated by a complicated interaction of client, therapist, and environmental factors and identified the TTM as one way to conceptualise this complex interplay. In an unpublished study, McConnaughy, Prochaska, Velicer, and DiClemente (cited in Prochaska & DiClemente, 1986) found that the URICA-based stage scores were better predictors of therapeutic progress than DSM-III diagnoses or symptom severity.

Some clinicians have advocated using the stages of change as a framework for engaging clients in therapy. van Bilsen (1995) supported the use of the stages of change to engage reluctant families in treatment, and Treasure, Schmidt, and Troop (2000) used the stages to guide treatment with clients who have eating disorders. Deffenbacher (1999) commented that "many individuals with anger problems are often at a precontemplative stage of change" (p. 299) and identified that "interventions, if they are to be successful at all, need to identify the individual's stage of readiness and be matched to it in order to move the individual to the next stage of change" (p. 299) although there is limited work applying the TTM to anger management (Howells & Day, in press). While these theory-based reports were useful, data-driven projects are necessary to demonstrate the stages' connection to psychotherapy completion.

Broadwell (1995) administered the URICA to 59 adults seeking outpatient therapy and cluster analysed the scores to generate cluster profiles. Six pre-treatment cluster profiles were generated: Precontemplative, Uninvolved, Discouraged, Decision-making, Action, and Maintenance. Twenty-five clients terminated treatment prematurely. The dropout rate for those in Precontemplation-related cluster profiles was 43%, and 41% for those in more advanced profiles. However, the similarity in dropout rates was explained by reference to the processes of change used in treatment. The participants who dropped out (within any given profile) were significantly more likely to have been exposed to a stage-mismatched intervention. Thus, those who remained in treatment did so because they received stage-matched interventions.

Smith, Subich, and Kalodner (1995) administered the URICA to 74 adult outpatient clients at pre-treatment. Unfortunately, the authors chose to assign participants to stages based on their highest stage score on the URICA. Smith et al. (1995) interpreted their chi-square analyses as indicating that premature terminators began therapy in the Precontemplation stage at a rate greater than expected by chance, whereas appropriate terminators began therapy in the Preparation and Action stages in at a rate greater than that expected by chance.

Franko (1997) used the URICA with 16 bulimic patients (in outpatient cognitive behavioural group therapy) to determine whether readiness for change predicted a reduction in binge frequency. Those participants who reduced their binge frequency at post-treatment had significantly higher pre-treatment Action stage scores than those who did not. The author admitted that not re-administering the URICA during and after treatment was a weakness of the study.

Wilson, Bell-Dolan, and Beitman (1997) administered the URICA to 131 adults enrolled in a four-week outpatient clinical drug trial for generalized anxiety disorder. The URICA was administered at pre-treatment only. Clinically significant improvement was associated with lower Precontemplation scores and higher scores on Contemplation and

Maintenance. Contrary to expectations, only high scores on Maintenance were associated with premature termination from treatment. The authors interpreted this last finding as suggesting that "perhaps patients high on Maintenance left treatment more often because they were satisfied with the progress sooner than other patients" (p. 405). This is possible, since drug treatment is an action-oriented intervention that may have satisfied these participants.

Brogan, Prochaska, and Prochaska (1999) administered the URICA to 60 adult outpatient clients at pre-treatment and then standardized the URICA scores. URICA profiles were generated on the basis of treatment behaviour. The Precontemplation stage was the highest peak on the premature terminators' profile. The Action stage was the highest peak on the appropriate terminators' profile. The continuation group had double high peaks with Contemplation and Maintenance, perhaps indicative of maintenance of considering the need for change.

Derisley and Reynolds (2000) administered the URICA to 60 adult psychotherapy outpatient clients at pre-treatment. URICA stage scores did not predict the number of treatment sessions attended, but low Contemplation scores were significant predictors of premature termination (Precontemplation narrowly missed being significant, $p = .07$). Derisley and Reynolds (2002) reported on the URICA's psychometric properties with the same sample. The authors reported the URICA had acceptable psychometric properties. Unfortunately, the authors advocated identifying stage membership on the basis of highest stage score on the URICA.

Several studies have supported the relationship between premature termination and Precontemplation stage scores. There was also evidence that treatment retention and clinical improvement was associated with Action stage scores. It also appeared that dropout rates could be equalized across stages if participants' stage of change was matched with the appropriate processes of change. These results could be interpreted as

support for Steenbarger's (1994) hypothesis that the TTM is a useful way to conceptualise the duration-outcome relationship in psychotherapy.

Criticisms of the TTM

Although the TTM has received empirical support, it is not without its critics. The criticisms fall into one of five categories: the research base is heavily biased toward addictions; the TTM is not a stage theory; the stages are descriptive in nature rather than explanatory; the stages lack predictive validity; and the URICA lacks psychometric integrity.

The Research Base is Biased

Given that much of TTM work is based on addiction samples and has only recently been applied to other problems (e.g. Petrocelli, 2002), the TTM has been criticized for being overextended to problem areas outside of addiction. While some reviews have examined the application of the TTM across problem behaviours (e.g., Littrell & Girvin, 2002), most reflected the TTM's origin in addictions with substance abuse (Carey et al., 1999; Joseph, Breslin, & Skinner, 1999) and smoking (Sutton, 2000a). Since the TTM was developed with an addictions focus, this is an important consideration when interpreting results from non-addiction samples (e.g., psychotherapy).

The TTM is not a Stage Theory

Bandura (1997, 1998) reported that the stages of change were not true stages. He listed three requirements of a true stage theory. First, there are qualitative transformations across stages. Second, there is an invariant sequence of change. In other words, people always move through the stages in the same order. Third, the stages are non-reversible. Individuals should never relapse during the change process. Bandura (1997, 1998) believed that the TTM must be a dimensional theory since it satisfied none of these criteria.

Bandura's (1997, 1998) three requirements can be addressed in turn. First, in terms of qualitative transformation across stages, every stage-based theory breaks down

when this criterion is applied stringently. Even Bandura's (1997) example of a caterpillar's metamorphosis into a butterfly cannot satisfy this criterion, for at what exact moment does a caterpillar cease being a caterpillar and become a butterfly? Second, in regard to invariant sequences of change, there is no research evidence that research participants skip any of the stages of change. Third, in terms of irreversibility, the stages of change would not meet this criterion, but it is not clear why Bandura (1997, 1998) offers this as a requirement of a stage-based theory. Sutton (2001) commented that "while invariance and irreversibility may be appropriate for developmental stages, it seems unrealistic to insist on such strict assumptions for stages of change of addictive behaviours" (p. 182).

Other authors (e.g., Weinstein, Sutton, & Rothman, 1998) proposed entirely different criteria for stage theories. Weinstein et al. (1998) cite four characteristics: a set of classification rules, a sequential ordering of stages, individuals in the same stage face similar problems, and individuals in different stages face different problems. Furthermore, Weinstein et al. (1998) cited the TTM as an example of a stage model.

Other researchers have argued that the stages are dimensional in nature. Davidson (1998) described the TTM as an artificial, simplistic segmentation of an underlying dimensional nature of change. Davidson (1998) stated that assigning individuals to stages involves creating "arbitrary differences in degree of *intention*" between Precontemplation, Contemplation and Preparation, while Action and Maintenance "are arbitrary divisions on a *behavioral* continuum" (p. 27, italics in original). While the substantial intercorrelations among the URICA stages could be advanced as support for this view, McConnaughy et al. (1983) stated that an invariant stage theory predicts that adjacent stages correlate more highly than nonadjacent ones (i.e., a simplex pattern). However, not all studies with the URICA found this result (e.g., Derisely & Reynolds, 2002).

Littrell and Girvin (2002) reviewed 87 studies related to the stages of change. The authors discussed several topics, including the evidence for discrete stages and sequential transitions. However, their method for reporting results combined studies that used different stage-related measures, despite Carey et al.'s (1999) caution that many of these measures have insufficient psychometric properties. In addition, several of the URICA studies reviewed by Littrell and Girvin (2002) used the URICA in a manner not supported by its developers (i.e., assigning participants to stages based on highest stage score). As a result, their conclusions that "empirical evidence that the proposed [stages] are not discrete" (p. 237) must be interpreted with caution. The authors did comment that "the lack of consistent evidence for distinct stages may be due to flaws in stage measures" (p. 248) of the stages.

Ultimately, a continuing focus on whether the stages of change are stages or dimensional constructs lacks purpose. In a manner reminiscent of the "nature versus nature" debate, too much time and energy has already been expended on this topic. Most critics focus on the stages of change at the expense of other constructs in the TTM. For example, Bandura (1997) criticized the stages of change on the basis that they do not account for risk perception (i.e., costs versus benefits of behaviour) or self-efficacy. However, both concepts are incorporated into the TTM. "It is only when individuals focus on a single variable in the transtheoretical model that concerns arise about continuous versus discrete representations of change" (Prochaska & DiClemente, 1998, pp. 39-40). While there is some evidence that the stages of change are discrete stages, the stages' interactions with dimensional variables such as cost-benefit analysis are of more conceptual and practical relevance (Prochaska & DiClemente, 1998).

The Stages of Change are Descriptive in Nature Rather than Explanatory

Both Bandura (1997) and Davidson (1992, 1998) criticized the stages of change as being descriptive devices rather than explanatory ones. These authors appear to have interpreted the research as promoting the stages as causative (i.e., producing an effect),

whereas the stages may be better understood as explanatory (i.e., making something intelligible or understood). The stages of change assist in explaining how change occurs but are not put forward as the causal factor (Fisher, 1996; Prochaska & Velicer, 1997). Clinical work is replete with the use of categories (e.g., what constitutes remission in cancer treatment, whether a client receives a DSM-IV diagnosis or not). Such descriptions are meant to be communication aids. Furthermore, these descriptions may assist professionals in planning interventions, since they offer suggestions on how people from each category may react. However, it is up to researchers and clinicians to use the stages of change responsibly and not promote them as the causes of change.

The Stages of Change Lack Predictive Validity

Another major criticism is the charge that the stages lack predictive validity. For example, Farkas et al. (1996) studied a stratified random sample of 2066 adult smokers taken from a larger sample of 24 296 adults who participated in the California Tobacco Survey between 1990 (baseline period) and 1992 (follow-up period). Participants were asked a number of historical questions related to cigarette use (e.g., number of cigarettes smoked per day) and the authors used the stage algorithm to place participants into stages of changes. The authors then conducted a logistic regression to develop a prediction equation. The stages of change did not enter into this equation and the authors theorized that this happened because the stages "may share common variance with the indicators of addiction level" (p. 1275). The authors then compared the baseline stages with the baseline historical variables to determine which better predicted cessation of smoking at the follow-up period. While stage of change was related significantly to cessation of smoking at the follow-up period, it was outperformed by a prediction equation generated from the historical variables. Farkas et al. (1996) concluded that the historical variables represent "a more appropriate theoretical basis for designing cessation intervention programs" (p. 1277).

There are problems with Farkas et al.'s (1996) study. The authors compared the predictive ability of a single variable (related to attitudes of future smoking) with several variables (of past smoking behaviour). Since past behaviour should typically be a good predictor of future behaviour and multiple variables should out-predict a single variable, the study design may have been predisposed to favour the historical variables over the stage algorithm. As mentioned earlier, there are many other studies (e.g., Prochaska et al., 1992) that indicated stage of change was a good predictor of treatment behaviour and completion.

Littrell and Girvin (2002) and Sutton (2000b; 2001) made excellent points when they identified that the bulk of the past research about the relationships of the stages of change to other variables have used a cross-sectional design rather than a longitudinal one. The predictive validity of the stages of change will only be confirmed when both stage membership and other relevant variables (e.g., quit attempts) are tracked longitudinally.

The URICA Lacks Psychometric Integrity

The final major criticism focuses on the psychometric properties of the URICA. Carey et al. (1999) reported that the URICA had adequate internal consistency, weak temporal stability, and mixed evidence for a four-stage factor structure. They were also concerned that the number of cluster profiles was sample dependent and highly variable between studies. The authors believed that these problems would make it difficult to interpret a specific individual's score on the URICA until the entire sample's data was cluster analysed.

In contrast, Davidson (1998) stated the URICA had excellent psychometric properties but questioned whether a test responder could draw meaningful distinctions between the eight items devoted to each stage (Davidson's [1998] concern was that each stage seemed to be composed of the same question being asked eight different ways). Prochaska and DiClemente (1998) responded to this by noting that "this question has to

be answered statistically by seeing whether measurement models using LISREL-type methods require correlated error residuals for an adequate fit. Such analyses have not needed such residuals" (p. 40).

Jefferson (1991, cited in Littrell & Girvin, 2002) criticized the wording of the URICA. First, all the items are scored in the same way, which increases the chance of a response set. Second, 13 of the 32 items are 'double-barrelled' in wording, making it unclear which part of the question should be answered. Third, several questions are worded awkwardly and difficult to understand. For example, Littrell and Girvin (2002) identified that "the lack of a clear referent may be confusing to respondents, particularly since the term *problem* appears in both its singular and plural forms" (p. 231, italics in original).

One thing that is clear from the criticisms is that there are many different researchers using different variants of the stages of change. It is not clear whether the variety of results is a reflection of differences in measurement or of the TTM. As Littrell and Girvin (2002) noted, "stages are defined and measured in a variety of ways" (p. 247). In regard to smoking, Sutton (2000b) stated "the lack of standardisation of measures, particularly of the central construct of stages of change, makes it difficult, if not impossible, to accumulate the findings into a coherent body of knowledge" (p. 221).

Some aspects of the TTM have been challenged, but the model has not been falsified. However, the TTM requires more systematic application to psychotherapy samples. There is some evidence that the stages represent discrete categories. The stages appear to have some predictive validity and while there are valid concerns about the wording of the URICA, it appears to have sufficient statistical integrity.

Application of the TTM to Forensic Work

The TTM is a statistically and clinically useful model of readiness to change. The earlier review of developments in the correctional field indicate four things: motivation is related to the Responsivity principle, many programs exclude offenders who lack

motivation, programs must include a motivational enhancement component, and a reliable measure of motivation is needed. However, it is unclear whether the TTM is the most appropriate model of treatment readiness for high-risk violent forensic populations. Wormith (2001) cautioned that "attempts to assess the 'stages of change' (Prochaska et al., 1994) amongst offender populations have not been terribly successful. This may be so because of the multidimensionality of antisocial behavior" (p. 19). However, Prochaska and his colleagues claim that their "approach is appropriate for high-risk populations with multiple behavioral risk factors" (Prochaska et al., 1994, p. 289). In fact, DiClemente and Prochaska (1998) stated that the URICA is quite useful "when the behaviours are illegal or there are perceived consequences for acknowledging lack of readiness" (p. 9). Kennedy (2000) went further, hypothesising that the TTM's "application to correctional intervention with a wide population of offenders, representing a range of offence types and settings, may well provide the conceptual focus that has been lacking" (p. 22) in existing correctional programming.

Treatment Attrition and the TTM

As reported earlier, dropout rates from psychotherapy are substantial (e.g., Wierzbicki & Pekarik, 1993) and the same problem is evident in forensic settings. Attrition rates from outpatient forensic services are considerable. Dalton, Major, and Sharkey (1998) reported that 28% of referrals never attended and another 28% terminated services early. Hambridge (1990) reported an overall non-attendance and early termination rate of 26%. Hird, Williams, and Markham (1997) reported a treatment dropout rate of 82% for outpatient anger management groups. Although Hird et al. (1997) did not use the URICA, they hypothesised that most of their 95 participants were probably in the Precontemplation stage. They recommended that motivation for change must be assessed and ensured prior to beginning an anger management program. In comparison, Serin (2001) reported that the early termination rate is approximately 18% for institutional treatment programs. Serin (2001) also suggested several interventions

consistent with the TTM that could be used to increase treatment attendance and completion rates (e.g., motivational interviewing).

The TTM as a Framework for Forensic Treatment

Several authors have advocated using the TTM as a framework for guiding treatment with different forensic populations. Kear-Colwell and Pollock (1997) advocated the use of the stages of change (in combination with motivational interviewing) as superior to a confrontational approach when working with child molesters. The former approach is hypothesized to "offer better long-term results with respect to the rate of reoffending" (p. 21) by "creating dissonance and a subsequent vision of change and by encouraging offenders to 'own' the process of change and facilitate its occurrence and then its maintenance" (p. 29). Dewhurst and Nielsen (1999) incorporated the TTM into treatment with sexual offenders as part of a relapse prevention approach.

Willoughby and Perry (2002) described how the stages of change could be used to guide treatment interventions with violent young offenders, and cited a case study of how the stages were used to guide treatment. They argued that a TTM-based approach "may keep youth in treatment longer, increasing the likelihood that they will learn the skills necessary to reduce their risk for violence" (p. 323). While the authors offered some practical advice for the application of the model and the potential benefits of providing stage-matched interventions, they did not provide empirical evidence for its utility beyond their case study.

Daniels and Murphy (1997) advocated the use of the stages and processes of change in the treatment of domestic violence as they believed existing programs offered "little guidance for intervention with clients who have not yet seriously contemplated change, clients who are contemplating change but have not yet made a firm commitment to change, and clients who have made important changes but need to maintain them" (p. 143). The authors presented a "mini-manual" complete with specific applications of how to provide stage-matched interventions for batterers. Several other authors (e.g.,

Brownlee, Ginter, & Tranter, 1998; Murphy & Baxter, 1997) also supported the use of a TTM-based approach with batterers. Levesque (2001) has developed a self-help guide for incarcerated domestic batterers that described the stages of change and provided a series of self-guided exercises to help clients move from Precontemplation to Maintenance.

TTM-related Measures and Forensic Samples

Several researchers have used TTM-inspired measures with forensic samples in order to study substance abuse, primarily in a descriptive manner. Farabee, Nelson, and Spence (1993) administered the Texas Christian University scale (TCU; Simpson, 1991) to 176 adult clients (83% male, 56% Caucasian) seeking treatment at an outpatient drug treatment program. Most (77%) were court-ordered to attend treatment. Scores on the TCU related to the Contemplation, Preparation, and Action stages were significantly lower for court-ordered participants. The authors concluded that this result was not surprising "given that involuntary clients in treatment tend to be less compliant initially than voluntary clients" (p. 344).

Grimley, Williams, Miree, Baichoo, Greene, and Hook (2000) administered their own stage algorithm to 204 incarcerated male juvenile offenders regarding readiness to change four health risk behaviours (smoking, alcohol use, drug use, and condom use). The mean age of the sample was 16.2 years, and 80% of participants were African-American. The stage breakdown across health behaviours was remarkably consistent: 45% in Precontemplation, 40% in Contemplation, and 15% in Preparation. The authors concluded that "these incarcerated youth were not too motivated to change their high-risk behaviours" (p. 366).

In contrast, Wells-Parker, Kenne, Spratke, & Williams (2000) conducted a follow-up study with their sample. They administered the Readiness to Change Questionnaire (RTCQ; Rollnick, Heather, Gold, & Hall, 1992) to 670 adults (80% male, 66% Caucasian) who attended a four-week court-mandated treatment intervention after being

convicted of driving while intoxicated. The RTCQ was administered at pre- and post-treatment. More than 75% of participants were in the Action stage at pre- and post-treatment, and approximately 75% of participants remained in the same stage from pre- to post-treatment. Contemplative participants were significantly more likely than Action participants to recidivate following treatment (12% vs. 5%)

Several researchers applied TTM-related measures to forensic samples in order to study criminal behaviour. Project Turnaround (2001) was a highly structured closed-custody program for young offenders in Ontario making use of "best practice" programming. The program lasted from four to six months; 158 high-risk young offenders participated in the program (58% had prior violent offences) and 136 were in a wait-list control group. The authors used multiple measures at pre- and post-treatment, including anger, attitudinal, and motivational tests with 55 treatment participants and 36 control group individuals. The Stages of Change worksheet developed by Miller and Rollnick (1991) was used, and the authors reported significant decreases in Precontemplative scores and significant increases in Action and Maintenance scores at post-treatment. The authors conducted correlational analyses between change scores for the Stages of Change worksheet (post-treatment score minus pre-treatment score) and recidivism, but none of the correlations were statistically significant. Recidivism information was available for 103 treatment group participants and 98 control group individuals. There was no significant difference in general recidivism between the treatment group (37%) and the control group (44%) during the post-treatment follow-up (average of one year). Participants were further identified as having or not having motivational barriers based on their score on a supplementary subscale from the Level of Service Inventory–Ontario Revised (LSI-OR; based on Andrews & Bonta, 1995) completed by a case manager. The recidivism rates for participants with motivational barriers were 50% for the treatment group and 44% for the control group; rates for those without motivational barriers were 34% for the treatment group and 42% for the control

group. The differences in recidivism between motivated and non-motivated groups and between treatment and control groups were not significantly different.

Begun, Murphy, Bolt, Weinstein, Strodthoff, Short, and Shelley's (2003) Safe at Home Stages of Change (SHSC) instrument was a 24-item self-administered test developed from interviews with therapists. The authors had 1349 men who battered their partners complete the SHSC at pre- and post-treatment. Test items were factor analysed into Precontemplation, Contemplation, or Preparation/Action stages. SHSC scores at pre-treatment significantly predicted gain in the use of negotiation to handle conflict (based on self- and other-report) but did not predict change in actual aggression (based on self- and other-report). The authors interpreted their negative findings as suggesting an insufficient follow-up time or that attitudes (assessed by the SHSC) were independent of actual behaviour. The authors concluded by stating "researchers must develop the relevant profiles based on this instrument" (p. 104).

Application of the URICA to Forensic Samples

Since there is concern that offenders may try to fake good on the URICA, it is important to identify the "fakeability" of the measure. Brigham (1996) administered the URICA to 150 adults (68% male, 57% African-American) seeking inpatient substance dependence treatment. Participants were randomly assigned to one of three conditions: fake good (i.e., "present yourself in the best possible light"), fake bad (i.e., "present yourself in the worst possible light"), and control (i.e., "present yourself as you really are"). There were no significant differences between the control and fake good groups on the stage scores. In contrast, the fake bad group's scores were significantly different from the control group's (i.e., higher on Precontemplation and lower on Contemplation, Action, and Maintenance). The author recommended that the URICA should be administered along with a socially desirable responding measure in situations in which faking is expected to occur.

URICA and Mental Health or Substance Abuse Studies

The URICA has been applied to several forensic samples to study its relationship to mental health or substance abuse issues. O'Hare (1996b) administered the URICA to 376 adult clients (57% female, 94% Caucasian) who sought treatment for outpatient services. Twenty-one percent of the sample was court-ordered to attend treatment. Five cluster profiles were generated through cluster analysis: Precontemplation (11% of participants), Uninvolved (42%), Contemplation (13%), Participation (24%), and Maintenance (10%). Participants in the Precontemplation and Uninvolved cluster profiles rated their distress about personal psychological problems and family problems as significantly less than participants from other clusters. O'Hare (1996a) provided additional information about cluster profile membership for court-ordered and non-court-ordered participants in another study. There was a significant difference in cluster profile membership between court-ordered and voluntary participants: Precontemplation (33% vs. 3%), Uninvolved (38% vs. 42%), Contemplation (8% vs. 14%), Participation (15% vs. 30%), and Maintenance (5% vs. 11%).

El-Bassel, Schilling, Ivanoff, Chen, Hanson, and Bidassie (1998) administered the URICA to 257 incarcerated adult female offenders (mean age 35 years, 63% African-American). Five profiles were generated through cluster analysis: Denial (60% of participants), Uninvolved (9%), Ambivalent (13%), Decision-making (13%), and Participation (9%). Participants in the Denial cluster profile were least likely to be depressed, whereas those in the Uninvolved and Participation cluster profiles were most likely to be depressed. Participants in the Denial cluster profile were also least likely to endorse symptoms of psychological distress.

Ginsburg (2000) investigated the utility of motivational interviewing with a sample of 83 incarcerated adult male Canadian offenders that had symptoms of alcohol dependence. Participants were divided into a control group and a treatment group (including motivational interviewing). The author administered several readiness for

change instruments at pre- and post-treatment, including the Readiness to Change Questionnaire–Treatment version (RCQ-TV; Heather, Luce, Peck, Dunbar, & James, 1999), the Stages of Change Readiness and Treatment Eagerness Scales (SOCRATES; Miller & Tonigan, 1996), and the URICA. The RCQ-TV and SOCRATES detected stage progressions between pre- and post-treatment; however, the URICA did not (the majority of participants were in the Contemplation stage at pre- and post-treatment). However, the lack of findings with the URICA may be explained by the author's method for assigning stage membership, as "the participant's stage of change was determined by the highest stage of change scale score" (Ginsburg, 2000, p. 91); the Contemplation stage scores are often the highest when stage scores are not standardised.

Overall, results from these studies indicated that court-ordered individuals were more likely to be placed in less advanced cluster profiles. Individuals in less advanced profiles were less likely to be distressed than those in more advanced profiles. There was some evidence that when motivation was a treatment focus, offenders' readiness for change increased.

URICA and Juvenile Offenders

Lerner (1990) administered a 16-item version of the URICA to 186 juvenile offenders (65% incarcerated, 82% male, 33% Caucasian, 29% Hispanic, 24% African-American). On this abbreviated URICA, there were five items related to Precontemplation, three items for Contemplation, four items for Action, and four for Maintenance (items were chosen to maximize alpha coefficients and minimise socially desirable responding and extreme scores). Unfortunately, the Precontemplation and Maintenance stages had low alpha coefficients. The author then grouped participants based on a self-administered stage algorithm and compared the groups' URICA scores. While URICA Precontemplation scores were significantly higher in the algorithm-based Precontemplators, this was the only clear-cut difference; URICA Contemplation scores did not differentiate Contemplators, Actors, and Maintainers from each other, algorithm-

defined Actors and Maintainers had similar URICA Action scores, and URICA Maintenance scores were similar across all four groups.

Hemphill and Howell (2000) administered the URICA to 225 young offenders. Most (78%) were male and ranged in age from 12 to 18. In addition to the URICA, participants completed the Paulhus Deception Scales (PDS; Paulhus, 1998) and the Multidimensional Anger Inventory (MAI; Siegel, 1986). Hemphill and Howell (2000) found that the basic psychometric data for the URICA was similar to that from past research, but reported a slightly different four-stage factor structure. Impression management was not significantly correlated with the stages, indicating that social presentation was unrelated to self-reported involvement in change. The pattern of correlations between the URICA and the MAI indicated that the Precontemplation stage was inversely related to expressing angry feelings whereas the Action stage was positively related. The authors also commented that their cluster analysis results (not reported in the study) were similar to those of McConnaughy et al. (1983). They concluded by advocating the use of the URICA in clinical practise.

URICA and Domestic Violence

Levesque, Gelles, and Velicer (2000) developed the URICA-Domestic Violence scale (URICA-DV) to specifically address male batterers' readiness to change. The URICA-DV was composed of 20 items related to domestic violence; the four stages (Precontemplation, Contemplation, Action, and Maintenance) were derived through factor analysis and each was composed of five items. Two hundred and fifty-eight men, the majority of whom were court-ordered for treatment, completed the URICA-DV. The authors produced seven cluster profiles that captured 236 (91.5%) of the participants. The following profiles were generated:

The Reluctant profile (Precontemplation-average, Contemplation-below average, Action-below average, and Maintenance-below average) was composed

of 28 (10.9%) participants, and this profile was described as "representing a reluctance to change" (p. 186)

The Immotive profile (Precontemplation-above average, Contemplation-below average, Action-below average, and Maintenance-average) accounted for 27 (10.5%) participants who were "likely to retain the status quo" (p. 188).

The Nonreflective action profile (Precontemplation-above average, Contemplation-below average, Action-above average, and Maintenance-below average) included 27 (10.5%) participants, and "these clients have not yet done the reflective work that should precede Action" (p. 188).

The Unprepared action profile (Precontemplation-below average, Contemplation-below average, Action-average, and Maintenance-below average) consisted of 27 (10.5%) individuals, and "these individuals have not fully acknowledged the extent of the problem and may be unprepared to sustain the changes they are making" (p. 188).

The Preparticipation profile (Precontemplation-average, Contemplation-average, Action-average, and Maintenance-average) accounted for 77 (29.8%) participants who were described as "somewhat engaged in thinking about, making, and sustaining changes" (p. 188).

The Decision-making profile (Precontemplation-below average, Contemplation-above average, Action-above average, and Maintenance-average) included 33 (12.8%) participants and "represents a transitional stage in which individuals are contemplating change and beginning to take action" (p. 190).

The Participation profile (Precontemplation-below average, Contemplation-above average, Action-above average, and Maintenance-above average) was composed of 17 (6.6%) individuals who were described as "thinking about the benefits of changing, actively working on ending their violence, and are acutely aware of the potential for relapse" (p. 190).

These profiles were similar to those developed in previous studies. Levesque et al. (2000) commented that the predictive validity (e.g., treatment attendance) of these profiles needed to be investigated.

Levesque et al. (2000) conducted five analyses comparing the cluster profiles with each other on relevant treatment variables. Four of the five hypotheses were supported or partially supported. Participants from less advanced cluster profiles were in treatment for shorter periods of time (although the result was nonsignificant). Individuals from more advanced cluster profiles used significantly more concrete strategies to stop their violence in the prior six months. Men from less advanced cluster profiles engaged in significantly more partner blame, and those from more advanced cluster profiles identified significantly more benefits to ending their domestic violence. Contrary to the researchers' expectations, men from more advanced cluster profiles reported more incidents of psychological aggression during the past year. The authors reported this could indicate these individuals' greater willingness to admit to such activity or that psychological aggression increased as these individuals reduced their use of physical aggression.

URICA and Treatment

It appears that the TTM is theoretically relevant to forensic populations. The stages have been found to be meaningfully related to substance use in forensic samples, and the cluster profiles generated for forensic participants were similar to those from non-forensic samples. The apparent difficulty in faking good on the URICA is a benefit when working with a forensic sample

Both Hemphill and Howell (2000) and McConnaughy et al. (1983) commented that the URICA profiles might have interpretative and clinical utility much like MMPI profiles. In addition, Levesque et al. (2000) suggested that stage-matched interventions would have greater therapeutic impact than generic action-oriented programs currently in use. The lack of matching treatment interventions to the offenders' readiness for change

may help to explain the substantial treatment non-completion rate in correctional treatment. Furthermore, a stage- (or profile-) matched approach is particularly important since clients who are coerced into treatment are likely to revert to old patterns of behaviours once the coercion is lifted (Prochaska & DiClemente, 1986). This may help to explain why treatment completers often do not fare better than control groups. If supported, these points would confirm what happens when the Responsivity principle is violated.

Serin and Kennedy (1997) attempted to develop a treatment responsivity protocol for adult male offenders. Participants were 72 federal offenders (21 treated sex offenders, 20 untreated sex offenders, and 31 treated non-sex offenders). The authors stated that 84% of the sample had violent index offences. Participants were administered the URICA, the Paulhus Deception Scales, and two author-developed measures (the Interpersonal Style Rating scale and the Treatment Evaluation Rating scale) before and after treatment. On the basis of nonsignificant correlations between the Treatment Evaluation Rating scale and the URICA, the authors concluded that "the URICA may be less applicable to offender populations that [sic] other clinical populations" (p. 11).

However, Serin and Kennedy's (1997) use of the URICA does not appear to have been appropriate. The authors reported that 45% of participants were at the Precontemplation stage prior to treatment and that none were in the higher stages. It is not clear how the remaining 55% of the sample was classified. In any case, their practise of placing participants into stages on the basis of URICA scores was discouraged by Rossi et al. (1995) because the URICA should be used to develop profiles. The authors' failure to conduct a cluster profile analysis of their participants' URICA scores resulted in the loss of interpretative and clinical utility.

McMurran et al. (1998) administered the URICA to 115 forensic inpatients (89 men and 26 women) who had been detained in an English hospital following violent offences. Every participant was diagnosed with psychopathic disorder as defined in the

English *Mental Health Act* of 1983. At an undisclosed point during an unexplained treatment program, participants completed the URICA, a self-esteem measure, and a self-efficacy measure. The authors found that the self-esteem measure did not correlate with the URICA. This is not surprising, since psychopathic individuals would likely have a healthy self-image regardless of their stage of change. The self-efficacy measure correlated significantly with the Action stage (.31) in the expected direction but nonsignificantly in the opposite direction with the Maintenance stage (-.17). Since the participants were hospitalised, this negative correlation may be reflective of an attitude of "maybe I'm getting better but I don't have the opportunity to prove it in the real world".

Like Serin and Kennedy (1997), McMurran et al. (1998) failed to conduct cluster profile analyses and instead grouped participants on the basis of their highest URICA factor. The authors concluded that their sample showed a Participation profile. A standardization of their results based on mean scores from other studies (e.g., Greenstein et al., 1999; Hemphill & Howell, 2000; Levesque et al., 2000; McConnaughy et al., 1983) indicated that their sample may be better conceptualised as an Immotive profile in which individuals "are likely to retain the status quo" (Levesque et al., 2000, p. 188). This profile would be particularly fitting if the participants were psychopathic and presumably less prepared to change.

Rationale for the Current Study

There are clear theoretical reasons why the TTM could be applied to a treatment program for high-risk violent offenders. First, as has been indicated in the review of previous research, the stages have been useful in describing clients' reduction of high-risk behaviours (e.g., Prochaska et al., 1992), and violence can be conceptualised as a high-risk behaviour. Second, as per Andrews' (1989) Responsivity principle, treatment should match (among other things) an individual's degree of motivation, and the TTM is a model of motivation. Third, the URICA has already been applied to forensic samples in order to generate psychometric data and cluster profiles. These profiles and data were consistent

with those from addiction-based research. Fourth, cluster profiles may function like MMPI profiles in that they may offer suggestions in terms of what to expect from client's future treatment behaviour. Fifth, the TTM provided a guideline for provision of therapeutic techniques (i.e., the processes of change).

It seems clear that a rigorous research approach must be carried out with the TTM. Previous applications of the TTM to offenders resulted in estimations of stage membership after the fact without use of a stage-based measure (e.g., Hird et al., 1997), not cluster analysing URICA scores (e.g., McMurran et al., 1998; Serin & Kennedy, 1997), or only using the URICA in a descriptive manner (e.g., Hemphill & Howell, 2000). Howells and Day (2002) commented that the stages of change have "received little research attention in relation to violent offenders" (p. 225) and that "the phenomenon of low readiness in violent individuals is poorly understood" (p. 226).

McMurran et al. (1998) stated that "the predictive validity of [the URICA] needs to be examined to see if it can tell us something about the progress of offenders in treatment programs" (p. 50). Levesque et al. (2000) mentioned that additional research is necessary to "assess the relationship between the profile clusters and measures of future behaviour. Measures of behaviour should be drawn from a variety of sources . . . the goal is to examine whether stage of change at intake predicts treatment attendance, completion, and gains" (p. 196).

These studies have highlighted the need to apply the URICA at pre- and post-treatment to offenders who are participating in a clearly defined, empirically-based treatment program, using standardised measures for treatment progress and treatment outcome, and conducting cluster profile analyses to help interpret URICA data. Evaluation of the Aggressive Behaviour Control (ABC) treatment program at the Regional Psychiatric Centre (Prairies) (RPC) would meet these requirements. The ABC treatment program was established in 1993 and provides treatment to male offenders who have an extensive history of violence, anger control problems, and/or serious institutional

misconduct. It was recently accredited by an accreditation panel of international experts in the field of treatment for violence. The program is based on social learning principles and uses a cognitive-behavioural/TTM-based treatment approach. Program goals include assisting individuals in changing their attitudes and behaviours, and helping them to develop an individualized comprehensive relapse prevention plan. A program workbook is used by patients and program delivery staff to help provide structure and consistency in delivery, as well as to provide patients with a step-by-step guide to the treatment (Wong, 1997). A program database exists that holds participant responses to standardised psychological tests relevant to violence and aggression. The URICA has been administered to treatment participants both before and after treatment. Finally, cluster analysis of URICA scores is possible since a large number of offenders have participated in the program.

The current archival study involved a sample of violent offenders who attended the ABC treatment program. Cluster analyses were conducted on archival URICA data to generate cluster profiles. The relationships between the cluster profiles and other pre- and post-treatment psychological tests (including measures of antisocial attitudes and anger) were examined. In addition, the relationships between the URICA cluster profiles and individuals' risk levels, and behaviour during and after treatment (including community recidivism) was investigated.

Hypotheses of the Current Study

The main question of the current study is "what is the utility of the TTM, as measured by the URICA, for identifying treatment progress in violent adult male offenders?" The study was divided into four parts and each of the hypotheses listed below addresses this main question in a different way.

1. In Part 1 of this study, the psychometric properties of the URICA were examined since this was the chosen TTM-related measure. It was hypothesized that:
    a. The URICA's mean scores, inter-stage correlations, and internal consistencies will be similar to those found in past research.
    b. Distinct profiles can be developed by cluster analysing the URICA stage scores at pre- and post-treatment.
    c. The cluster profiles will be similar to those found in previous research and can be "ranked" in terms of least to most ready to change at both pre- and post-treatment.
    d. The cluster profiles will be independent of sample demographics; however, Self Deceptive Enhancement scores of the Paulhus Deception Scale (PDS; Paulhus, 1998) will correlate negatively with cluster profile rankings (since individuals that are less ready to change are presumed to be less willing to admit that they have a problem).
2. Part 2 involved an examination of whether the study variables were able to measure change in the sample from pre- to post-treatment. Pre- and post-treatment scores regarding anger, antisocial attitudes, knowledge of relapse prevention techniques, and overall risk were compared. In addition, it was hypothesized that as time in treatment progresses, weekly averaged group behaviour checklist (GBC) scores will increase.
3. Part 3 of this study explored the relationship between the pre- and post-treatment cluster profiles and measures of criminal behaviour and attitudes. It was hypothesized that:

a. Subscale scores from the State-Trait Anger Expression Inventory (STAXI) will correlate positively with the cluster profile rankings at pre- and post-treatment.

b. Relapse Prevention Inventory (RPI) scores will correlate positively with the cluster profile rankings at pre- and post-treatment (after controlling for IQ).

c. Scores from the Criminal Sentiments Scale-Modified (CSS-M; Shields & Simourd, 1991) will correlate negatively with the cluster profile rankings at pre- and post-treatment.

d. Individuals' reason for discharge from treatment will be related to pre- and post-treatment cluster profiles.

e. More advanced cluster profiles will be associated with greater GBC scores throughout treatment than less advanced cluster profiles.

f. Individuals from more advanced cluster profiles will be a qualitatively unique group in terms of treatment behaviour (as measured by the GBC).

g. Psychopathy Checklist-Revised (PCL-R) total, Factor 1, and Factor 2 scores will correlate negatively with the cluster profile rankings at pre- and post-treatment. Given the importance attributed to psychopathy in forensic settings (e.g., Hare, 1998), additional hypotheses were generated to explore psychopathy in this sample:

    i. It is expected that PCL-R scores will correlate positively with Violence Risk Scale (VRS; Wong & Gordon, 2002) scores (total,

static, and dynamic) and Security Reclassification Scale (SRS; Luciani, in press) scores (total and category).

ii. Psychopaths are expected to score significantly higher than nonpsychopaths on the VRS and SRS.

iii. It is expected that PCL-R scores will correlate negatively with GBC scores and that psychopaths will score lower than nonpsychopaths on the weekly GBC scores.

iv. It is expected that PCL-R scores will correlate positively with the amount of institutional misconduct and community recidivism, and correlate negatively with time to first misconduct and recidivism.

v. Psychopaths are expected to receive significantly more misconducts and recidivism and significantly earlier than nonpsychopaths.

h. SRS scores will correlate negatively with the cluster profile rankings at pre- and post-treatment.

i. VRS scores will correlate negatively with the cluster profile rankings at pre- and post-treatment.

j. After controlling for VRS total score, the amount of violent and nonviolent institutional misconduct received post-RPC will correlate negatively with the cluster profile rankings at pre- and post-treatment.

k. After controlling for VRS total score, the time to first institutional misconduct post-RPC will correlate positively with the cluster profile rankings at pre- and post-treatment.

l. After controlling for VRS total score, the amount of community recidivism will correlate negatively with the cluster profile rankings at pre- and post-treatment.

m. After controlling for VRS total score, the time to first community recidivism will correlate positively with the cluster profile rankings at pre- and post-treatment.

4. In Part 4 of the study, individuals were placed into discrete stages of change using the VRS (for both pre- and post-treatment).

   a. The cluster profile rankings will correlate positively with VRS stages at pre- and post-treatment.

   b. The relevant analyses conducted with cluster profiles in Parts 1 and 3 were repeated for the VRS stages. It was hypothesised that the VRS stages will have significantly greater correlations with these other variables than did the cluster profile rankings. This was expected because the VRS was developed specifically to assess risk for violent offenders and the other variables in the correlational analyses were either risk factors (e.g., antisocial attitudes measured by the CSS-M), other risk measures (e.g., PCL-R), or results of poorly managed risk (e.g., community recidivism).

CHAPTER 2: METHOD

Approval to conduct this study was received from the University of Saskatchewan Advisory Committee on Ethics in Behavioural Science Research and the Regional Psychiatric Centre (RPC) Research Review Committee. The approval forms are attached in Appendix A.

File Reviews

Data was collected from the institutional files of 198 federally incarcerated male offenders. Each individual received at least one conviction for a violent offence, participated in the ABC treatment program at the RPC between October 1997 and April 2002, and voluntarily completed the RPC's standard pre- and/or post-treatment questionnaire battery. Of most importance was that each person had completed a pre- and/or post-treatment URICA. Given the archival nature of this study, it was not possible to ensure that all data components were available for all 198 individuals. For example, although a person was included in the study because he completed the URICA, he may not have completed all other self-report instruments. Table 1 identifies the information available for each individual whose file was reviewed.

Table 1

Sample size based on instrument

	Pre-treatment *N*	Post-treatment *N*	Pre- and Post-treatment *N*
URICA	192	129	123
CSS-M	194	134	130
STAXI	192	134	128
RPI	149	103	99
PDS	150	104	99
GBC	N/A	N/A	67
VRS	198	198	198
PCL-R	N/A	N/A	198
SRS	128	144	104
Institutional Misconduct	N/A	193	N/A
CPIC Recidivism	N/A	50	N/A

Given the unequal sample sizes for pre- and post-treatment data, the possibility of a self-selection sampling bias was explored. Individuals who completed both pre- and post-treatment testing were compared to those who completed pre-treatment testing only. No significant differences were found using *t* test analyses to compare the two groups on age, education, IQ, or security classification; although there was a significant finding for length of sentence (see Table 2).

Table 2

Comparisons of Those With and Without Post-treatment Data

	Pre & Post Testing	Pre Testing Only	*t* test
Age	30.9 (123)	31.8 (69)	$t(190) = .68$
Education	9.8 (114)	9.5 (63)	$t(175) = -1.26$
IQ Percentile	35.75 (115)	29.92 (66)	$t(179) = -1.59$
Security Classification	22.12 (85)	21.74 (39)	$t(122) = -.42$
Sentence in Months	94.10 (89)	69.82 (56)	$t(142.89) = -3.15$***

Note: Numbers in parentheses represent number of individuals.

*** $p < .005$.

Using chi-square analyses, no significant relationships were found between post-testing availability and marital status (χ^2 [1, n = 190] = 1.32, p = .25), ethnic background (χ^2 [2, n = 191] = 4.91, p = .09), occupation (χ^2 [3, n = 165] = 1.94, p = .59), or having a life sentence (χ^2 [1, n = 44] = 2.26, $p > .05$). A significant relationship was identified between post-testing availability and discharge reason (χ^2 [3, n = 190] = 87.67, p = .00; see Table 3). This result is expected since removal from treatment prematurely would result in the individual not being available for post-treatment testing.

Table 3

Discharge Reason

	Completed Treatment	Paroled	Patient Requested	Removed from Treatment
Pre-testing only	28 (19%)	2 (100%)	13 (100%)	26 (96%)
Pre- & Post-testing	120 (81%)	0 (0%)	0 (0%)	1 (4%)

These results suggested that individuals who completed pre-treatment testing but not post-treatment testing had shorter sentences and were more likely to be discharged

from the RPC without completing the treatment program (i.e., patient requested, paroled, or removed by treatment staff). Overall, it appeared that individuals who completed pre-treatment testing only are similar to those who completed both pre- and post-treatment testing on a number of demographic variables. However, it is possible that those individuals who were less interested in, or ready for, treatment self-selected themselves out of the post-testing. Therefore, the post-treatment comparisons in this study may include a more positive or more determined group of inmates than the pre-treatment comparisons.

As an additional check for sampling bias, the cluster analyses described in Part 1 of the Results section and the correlational analyses described in Part 3 of the Results section were conducted with the subsample of individuals who completed both pre- and post-treatment testing (n = 123). The pattern of correlations was similar to those found for the entire sample. These results provide further support that individuals who completed pre-treatment testing only were similar to those individuals who completed both pre- and post-treatment testing.

The average age of the 198 individuals in this study was 31 years (range of 18 to 63 years). The ethnic background of the sample included 85 Caucasians (43%), 104 Aboriginals (53%), and nine (4%) of other decent (i.e., Hispanic, Black, Asian). One hundred and nineteen individuals (60%) were single, 61 (31%) were in a relationship, and 16 (8%) had separated or divorced from their partner. Marital status was unknown for two individuals (1%). The average education of the individuals was 9.7 years (range of 4 to 13 years), and the average sentence was 85.64 months (range of 24 to 280 months). In addition, there were 44 individuals who had received life sentences. Twenty-six (13%)

individuals identified their occupation as blue collar (e.g., electrician, iron worker, city worker), 97 (49%) were labourers (e.g., cleaner, dishwasher, logger), 46 (23%) were unemployed, and one (1%) person was a white-collar worker (i.e., businessman). Occupational information was unavailable for 28 people (14%).

Prior to admission to RPC, the individuals had an average of four violent convictions (range of zero to 25). The index conviction was the first violent conviction for 67 people. Individuals had an average of three violent charges (range from zero to 66). Fifteen people had no violent charges prior to their index offences.

Of the 198 individuals whose files were reviewed, institutional misconduct information was available for 193 of them. These individuals were incarcerated for an average of 18.3 months (range of one to 54 months) post-RPC treatment. Sixty-five percent of the sample received at least one institutional misconduct. One hundred and twelve (58%) individuals in the sample received convictions for nonviolent misconduct and 70 (36%) received charges for nonviolent misconduct. Twenty individuals (10%) received convictions for violent misconduct and 17 (9%) received charges for violent misconduct. Given the relatively small base rate of violent misconduct, the number of convictions and charges were combined resulting in 123 (64%) people engaging in nonviolent misconduct and 29 (15%) engaging in violent misconduct.

Of the 198 individuals whose files were reviewed, 50 (25%) were released from prison for at least nine months after completing treatment and before the final follow-up date of July 15, 2002. These individuals were in the community for an average of 22.4 months (range of nine to 50 months). Of these 50 individuals, 32 (64%) were reconvicted of an offence and 15 (30%) received a criminal charge. Individuals could receive both

nonviolent and violent charges and convictions. Of the 32 individuals who recidivated, 11 (34%) received violent convictions and 30 (94%) received nonviolent convictions. Of the 15 individuals who received a criminal charge while in the community, 9 (60%) received violent charges and 14 (93%) received nonviolent charges.

Materials

Self-Report Pre- and/or Post-treatment Process Variables

The University of Rhode Island Change Assessment scale (URICA; McConnaughy et al., 1983) consists of 32 items designed to measure four stages of change: Precontemplation, Contemplation, Action, and Maintenance. There are eight items per stage, and each item is scored using a five-point Likert scale ranging from Strongly Agree (1) to Strongly Disagree (5). This scale was developed originally for use with psychotherapy clients and scale items refer to a generic "problem". The wording of the URICA used at the RPC was adapted slightly in order to make it easier to read (see Appendix C). Researchers have been discouraged from using the URICA to classify individuals into stages due to the fact that respondents often endorse elements of various stages simultaneously (Carey et al., 1999). They are instead encouraged to use cluster analysis to develop cluster profiles (Rossi et al., 1995). However, the number of profiles identified is sample dependent and therefore variable.

In a sample of psychotherapy patients, McConnaughy et al. (1983) reported alpha coefficients of .88 to .89 for each stage. In the same sample, the Precontemplation stage correlated negatively with the Contemplation, Action, and Maintenance stages (-.50, -.20, and -.20, respectively), whereas the three latter stages correlated positively with each other. Abellanas and McLellan (1993) also found the scores on the Precontemplation

stage correlated negatively with the scores on the other three stages. Another study of psychotherapy clients (McConnaughy et al., 1989) found the internal consistency ranged from .79 to .84. Factorial evidence for the validity of the URICA has been mixed. In two studies with psychotherapy clients (McConnaughy et al., 1983, 1989), factor analysis supported the URICA's four stages. DiClemente and Hughes' (1990) study with a sample of alcohol treatment outpatients replicated the four stages, however, one item was dropped from each subscale due to weak or inconsistent loadings. Belding, Iguchi, and Lamb (1996) failed to replicate the factor structure in a sample of drug abusers (they also cited two unpublished studies that failed to replicate the stages).

The Criminal Sentiments Scale–Modified (CSS-M; Shields & Simourd, 1991) is a modified version of the original Criminal Sentiments Scale (CSS; Gendreau, Grant, Leipciger, & Collins, 1979). It is a 41-item measure designed to assess attitudes that are favourable to criminal behaviour and criminal peers. Items are scored using a three-point Likert scale (Agree, Undecided, and Disagree), with higher scores reflecting greater criminal attitudes. The CSS-M consists of five scales: Attitudes toward the Law; Attitudes toward the Police; Attitudes toward the Courts; Tolerance for Law Violations (TLV); and Identification with Criminal Others (ICO). The first three subscales assess respect for the law and criminal justice system. The TLV subscale measures justifications for criminal behaviour, and the ICO taps personal evaluative justifications for criminal behaviour. The CSS and CSS-M have been administered to a wide range of populations including probationers, provincial and federal inmates, young offenders, probation officers, and university students (Andrews, Wormith, & Kiessling, 1985; Wormith & Andrews, 1984; 1995).

In a sample of Canadian federal inmates (Andrews & Wormith, 1990), alpha coefficients for the subscales were .80, .80, .81, .81, and .53 respectively. In this same sample, the Attitudes toward the Law, Police, and Courts scales intercorrelated .70 to .71 with each other, and these three scales together correlated -.67 with ICO, and -.45 with TLV. In a study of 381 male offenders from a medium-security Canadian federal institution, Simourd and Olver (2002) found good internal consistency for the CSS-M total score (.91) and moderate internal consistency for the individual subscales: Law (.72), Courts (.76), Police (.72), TLV (.76), and ICO (.51). Simourd and van de Ven (1999) found a moderate degree of internal consistency (.75) for the CSS-M total score with a sample of 141 violent and nonviolent federal offenders. When they looked at the internal consistency based on offence type, they found reasonable levels for violent (.73) and nonviolent (.75) offenders. In a sample of 114 federal offenders, Simourd (1997) found acceptable levels of internal consistency for the CSS-M total and subscales (.70 to .76) and modest correlations among the subscales (r = .15 to .91).

In Simourd's (1997) sample, significant correlations were found between the CSS-M and total number of institutional misconducts. The CSS correlated .44 with reconviction during a three-year follow-up (Andrews & Wormith, 1990). The CSS was found to predict recidivism among mainly first-time property offenders (Wormith & Andrews, 1995) and re-arrest among violent offenders (Simourd & van de Ven, 1999). Witte, Di Placido, Gu, and Wong (2002) found the CSS total and subscales to be significantly correlated to violent and non-violent recidivism at 39 and 55-month follow-up periods for a sample of sexual offenders who had completed treatment (correlations ranged from .26 to .37). They also found significant receiver operating characteristics

(ROC) curves indicating that the pre- and post-treatment CSS total scores predicted violent and non-violent reconvictions. Significant ROC curves were not evident for sexual reconvictions. However, Mills and Kroner (1997) found that the CSS was not correlated with reconviction or parole violations during a 16-month follow-up among a sample of older violent offenders.

The Relapse Prevention Inventory (RPI) is a 71-item multiple-choice measure developed by the RPC Research Department. Individuals' knowledge of relapse prevention techniques is tested through the application of treatment material to vignettes. For example, individuals are asked to decide if the following statement is true or false: "Most people learn their patterns of anger from the environment they grow up in". In a study with 183 sexual offenders and 121 violent offenders, the pre- and post-treatment scores on the RPI were correlated significantly with therapist and treatment improvement ratings (correlations ranged from .32 to .46 at pre-treatment, and from .33 to .58 at post-treatment; Chopin, Di Placido, Witte, & Wong, 2003). In this same study, the alpha coefficient was .89 at pre-treatment, and .88 at post-treatment. The authors found no significant correlations between the RPI and institutional misconduct. However, they did find that pre- and post-treatment RPI scores were significantly correlated with nonviolent recidivism in an average follow-up of 18 months (r = -.29 at pre-treatment; r = -.28 at post-treatment). No further validity, reliability, or normative studies have been conducted on this instrument.

The Paulhus Deception Scale (PDS; Paulhus, 1998) is a 40-item measure used to assess individuals' level of socially desirable responding. Each item is scored on a five-point Likert scale ranging from Not True (1) to Very True (5). There are two subscales:

Impression Management (IM) and Self-deceptive Enhancement (SDE). The IM assesses wilful deception in presenting the self in a more favourable light. Respondents are asked to "rate the degree to which they typically perform various desirable, but uncommon, behaviours (e.g., I always obey laws even if I'm unlikely to get caught)" (p. 9). If respondents claim an over-abundance of the unlikely behaviours, they may be purposely exaggerating. High scores obtained in situations where there is some pressure to engage in impression management can be safely interpreted as conscious distortion. The SDE assesses unintentional emphasis on positive attributes of the self. "High-scorers show a form of self-enhancement best described as rigid overconfidence akin to narcissism" (p. 9). This instrument is now part of the standard assessment battery administered to inmates entering the Ontario correctional system (Paulhus, 1998).

The alpha coefficients for the total score, IM, and SDE were .86, .84, and .72, respectively, for Canadian inmates (Paulhus, 1998). The two subscales correlated .20 with each other, indicating that they were tapping related yet independent aspects of social desirability. The PDS total score correlated .73 with the Marlowe-Crowne Scale of Social Desirability (Crowne & Marlowe, 1960). SDE scores have been found to be positively associated with objective indicators of overconfidence, hindsight bias, overclaiming, self-inflation, and self- and peer-reports of adjustment. Scores on the IM were more sensitive to situational demands for self-presentation.

The State-Trait Anger Expression Inventory (STAXI; Spielberger, 1991) is a 44-item scale designed to measure the expression and experience of anger. Individuals rate themselves on a four-point Likert scale for each item. Spielberger (1991) hypothesized that anger has two major components: State Anger and Trait Anger. "State anger is

defined as an emotional state marked by subjective feelings that vary in intensity from mild annoyance or irritation to intense fury and rage" (p. 1). It is influenced by perceptions of injustice or unfair treatment by others. "Trait anger is defined as the disposition to perceive a wide range of situations as annoying or frustrating, and the tendency to respond to such situations with more frequent elevations in state anger" (p. 1). In addition, the expression of anger has three major components: Anger-in (i.e., the suppression of angry feelings), Anger-out (i.e., the outward expression of angry feelings), and Anger Control (i.e., the extent to which the individual attempts to control the expression of anger).

Normative data for this instrument has been collected from research with adults, adolescents, and college students (Spielberger, 1991). The alpha coefficients for adults on the subscales of the STAXI ranged from .69 to .91. Concurrent validity studies with undergraduate college students and Navy recruits found that the State Anger and Trait Anger subscales correlated positively with the Neuroticism and Psychoticism scales of the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975). The Trait Anger subscale correlated positively with scores from the Buss-Durkee Hostility Inventory (Buss & Durkee, 1957). The anger expression subscales correlated appropriately with blood pressure measures (i.e., positive correlations for the Anger-In subscale and negative correlations for the Anger-Out subscale; Johnson, 1984). Normative data has also been collected for prison inmates (Spielberger, 1991). The mean scores of the prison inmates were substantially higher than all other normative groups. The alpha coefficients for the prison inmates were comparable with the alphas for non-criminal adults, adolescents, and college students. Kroner and Reddon (1995) administered both the STAXI and the BPI to

a sample of Canadian inmates. They found that anger scores were positively correlated with interpersonal problems, alienation, and impulsivity.

Staff-report Treatment Process Variables

Individuals' behaviour and progress during the ABC treatment program was rated using an RPC-developed group behaviour checklist (GBC). The GBC was designed as an ongoing assessment of each individual's group behaviour over the course of his treatment program. One group facilitator completed the checklist for each individual after all groups were completed for that day. The ratings are meant to reflect an individual's overall daily behaviour. This checklist includes information regarding individuals' punctuality, overall participation, self-disclosure, provision of feedback, receptiveness to feedback, challenge of co-patients, helping and hindering roles, preparation for group, emotional expression, and understanding of concepts. The ratings are on a five-point scale, with higher scores indicating better group treatment behaviours.

Other than the face validity of this instrument, no additional validity, reliability, or normative studies have been conducted. There are potential limitations in using the GBC data. First, it cannot be guaranteed that the staff completed their GBC ratings in a timely manner after group given the busy clinical environment. As a result, the accuracy of the ratings may fluctuate based on staff recall of group behaviour. Second, there may have been problems with the reliability and validity of GBC scores. Although all staff were trained on appropriate rating procedures, there may have been rater drift over time given the lack of "booster" training sessions. In addition, it was not possible to calculate interrater reliability since no double ratings of GBC scores were completed.

Risk Variables

The Violence Risk Scale (VRS; Wong & Gordon, 2002) was designed to assess the risk of violent recidivism for incarcerated forensic clients. The instrument is comprised of six static factors (e.g., age at first violent conviction) and 20 dynamic factors (e.g., interpersonal aggression). Each factor is scored on a four-point scale, where higher scores indicate a stronger relationship with violent behaviour. Information for scoring is obtained from interview and collateral file sources. Since risk for violence can fluctuate, the VRS was designed to evaluate changes in risk levels as a result of treatment. Using an adapted version of Prochaska and DiClemente's (1982) stages of change, each dynamic factor is rated before and after treatment in order to assess treatment gain (i.e., movement through the stages).

Gordon (1998) reported that the pre-treatment rating of risk was internally consistent (alpha = .92), and demonstrated high interrater reliability (r = .85). In looking at a sample of 19 male federal offenders, Wong, Flahr, Maire, Wilde, Gu, and Wong (2000) also found high interrater reliability for the static (.98), dynamic (.82), and total (.92) scores on the VRS at pre-treatment. Assessing the amount of change in offenders' scores as a result of treatment had high internal consistency (.92; Gordon, 1998), and can be rated reliably (Dhaliwal, Demyon, Gordon, & Wong, 1999). Dhaliwal et al. (1999) found that two raters identified the same amount of change from pre- to post-treatment for 78% of VRS items on a sample of 20 federal offenders. Toni (1999) found good internal consistency for the VRS total score (.85) with a sample of 20 psychopathic offenders.

Gordon (1998) reported that the VRS total score correlated significantly with four subscales from the Interpersonal Behavior Survey (Mauger & Adkinson, 1980; general aggression [.28], expression of anger [.33], physical aggression [.40], and passive aggressiveness [.29]), the General Statistical Information on Recidivism (GSIR; Nuffield, 1982; .49), the Level of Service Inventory-Revised (Andrews & Bonta, 1995; .83), and the Psychopathy Checklist-Revised (PCL-R; Hare, 1991; .78). Burt and Wong (1999) found significant correlations between the VRS pre-treatment total score and PCL-R total (.46), Factor 1 (.33), and Factor 2 (.52) scores. Similar results were found for the VRS post-treatment total score with PCL-R total (.48), Factor 1 (.36), and Factor 2 (.54) scores. Significant correlations were also found between the pre-treatment VRS rating and the GSIR (.60), and the post-treatment VRS ratings and the GSIR (.59) in a sample of 47 mentally disordered offenders (Wong, Olver, Wilde, Nicholaichuk, & Gordon, 2000).

In a sample of 71 male federal inmates, VRS pre-treatment risk ratings were significantly correlated with the postdiction of violent convictions (.40) and the VRS post-treatment change ratings were negatively correlated (-.28) with post-treatment violent convictions (Wong, Gordon, Vander Veen, & Gu, 1999). They found that the VRS post-treatment total scores were significantly correlated with post-treatment violent conviction rate (.26) but not with pre-treatment violent conviction rate. Burt and Wong (1999) found that with a sample of 38 male federal offenders, the change between the VRS pre- and post-treatment ratings was significantly correlated with changes in rate of violent recidivism (.32) at a one year follow up period but not at a two year follow-up period. Both pre- and post-treatment VRS total scores were significantly correlated with number of violent offences post-treatment (.47 and .45, respectively). In a study looking

at 47 mentally disordered offenders, Wong et al. (2000) found that the VRS scores were correlated significantly with violent recidivism (.25), and general recidivism (.36). Narine, Burt, Witte, Wong, and Gu (2001) found significant correlations between the VRS and violent recidivism (.33) and nonviolent recidivism (.30) in a sample of 44 paranoid schizophrenic offenders who were followed-up in the community for an average of 100 months. Overall, the results of these studies provide evidence that the VRS can predict violent and general recidivism among offenders.

The Psychopathy Checklist-Revised (PCL-R; Hare, 1991) was designed to assess psychopathy in adult populations. The measure is comprised of 20 items, and is divided into two factors: Factor 1 (personality traits) and Factor 2 (antisocial behaviour). The scores on the PCL-R range from 0 to 40, with a score of 30 and above warranting a diagnosis of psychopathy. Hare (1991) pooled data from 11 studies into two samples (offenders and forensic patients) to demonstrate the validity and reliability of the PCL-R. For the sample of 1192 inmates, alpha coefficients for the Total, Factor 1, and Factor 2 scores were .87, .84, and .77 respectively and the mean inter-item correlations were .26, .40, and .28 respectively. In the sample of 440 forensic hospital patients the alpha coefficients were .85 for the Total score, .80 for Factor 1, and .77 for Factor 2. The mean inter-item correlations were .22, .34, and .28 respectively. The interrater reliability averaged over two ratings and measured by the intraclass correlation coefficient was .91, .86, and .91 for the Total, Factor 1, and Factor 2 scores when based on a subsample of 385 inmates. For a subsample of 90 forensic hospital patients, the averaged interrater reliability was .93, .88, and .92 for the three scores respectively. In order to demonstrate the concurrent validity of the PCL-R, Hart, Hare, and Harpur (1992) reported that the

point-biserial correlations between PCL-R Total scores and DSM-III/DSM-III-R diagnoses of antisocial personality disorder averaged about .55.

The PCL-R has been found to predict conditional release violations in a number of studies (e.g., Hare, McPherson, & Forth, 1988; Serin, Peters, & Barbaree, 1990) and also appears useful in predicting violent recidivism (e.g., Harris, Rice, & Cormier, 1991; Rice, Harris, & Quinsey, 1990). The PCL-R is considered to be a reliable measure when completed retrospectively using file information only if thorough file information is available (Grann, Langstrom, Tengstrom, & Stalenheim, 1998).

The Security Reclassification Scale (SRS; Luciani, in press) is a research-based tool designed to assist caseworkers (usually institutional parole officers) to determine the most appropriate level of security at key points throughout an offender's sentence. It is completed once approximately every 12 months. The scale is composed of 15 items that are divided into three sections. The institutional adjustment section includes items related to disruptive institutional behaviour. The escape risk section involves factors such as history of escape attempts from custody. The public safety section includes items related to whether the offender has made progress toward addressing personal criminal risk factors. Numerical cut-off scores are used to determine whether the offender received a minimum, medium, or maximum security classification with higher scores representing higher risk and resulting in higher security ratings. Caseworkers can use professional judgement to override a score and a rationale must be provided for the override decision (Correctional Service of Canada, 2001). The SRS has been validated and field-tested with results suggesting a high degree of concurrent validity (Blanchette, 2001).

Outcome Variables

Institutional misconduct that occurred after treatment at RPC was collected for each individual through an institutional file review. Misconducts were coded as violent if physical or verbal aggression was involved (e.g., fighting, threats). Misconducts were coded as nonviolent if there was no violent component to the misbehaviour (e.g., failing to stand for count, possession of contraband).

Recidivism information for those individuals who were released to the community following treatment was collected through a review of individuals' institutional and Canadian Police Information Centre (CPIC) files. It has been argued (e.g., Maltz, 1984; Simourd & van de Ven, 1999) that reconviction and reincarceration may be overly stringent indicators of offenders' conduct post-release particularly with a relatively short follow-up period. We therefore collected information about the number, date, and type of charges as well as convictions that individuals received.

Procedure

Since this was an archival study, there was no direct contact between the researcher and the individuals whose information was used. It is important to note that even though there was no direct contact, it was still essential to address individuals' vulnerability. Every precaution was taken to ensure the confidentiality and rights of the individuals whose files were reviewed. In order to do this, each person was assigned a confidential identification number and one master list was created that matched individuals' names with their number. Only the researcher and her supervisor have access to this list, which is stored in a locked filing cabinet within the Research Unit at the RPC. All data collected in this investigation will be stored in a separate locked filing

cabinet at the RPC for a minimum of five years. This data will only be available to the researcher, the Director of Research at RPC, and the Coordinator of Research at RPC. No individual information collected as part of this study was released to the Correctional Service of Canada or will be included in any future publications. However, a final copy of the study results, involving group data only, will be made available to the RPC for their records. In addition, the researcher received enhanced security clearance from the Correctional Service of Canada in order to access institutional files and is obligated to adhere to conditions in the Privacy Act. When the data was collected by someone other than the researcher (e.g., research assistant), this person had also received enhanced security clearance and was obligated to adhere to the conditions of the Privacy Act.

Forensic researchers using archival data must ensure that the potential benefits of their research outweigh the inherent costs. In the current study, the costs included (1) individuals consented to complete the self-report measures for research purposes, and although the current study clearly falls within the bounds of appropriate research the individuals did not know that their data was used for this study in particular, and (2) individuals did not receive any direct feedback about the results of the current study and therefore did not benefit directly. However, it was believed that these costs were outweighed by the potential benefits to society in general and future program participants in particular through increasing our knowledge of the role motivation plays in changing violent criminal behaviour.

The majority of the information was collected from an existing program evaluation database maintained by the RPC Research Department. Descriptive information for each individual (including age, marital status, ethnic background,

education level, occupation, date of admission, date of discharge from RPC, reason for discharge from RPC, and IQ, [as measured by the Quick Test; Ammons & Ammons, 1962]), and pre- and post-treatment scores on the CSS-M, URICA, RPI, PDS, and STAXI questionnaires were obtained from this database. This information was then entered into another database that was specific to the current study.

Individuals' behaviour and progress during the ABC treatment program was obtained from the GBC forms that were normally completed by the ABC treatment staff and kept on file in the treatment units. Unfortunately, an unknown number of the GBC forms were destroyed by treatment staff. As a result, this information was available for approximately one-third of the total sample (n = 67). Individuals for whom GBC information was available were compared with individuals for whom this information was not available. No significant differences were found using t test analyses to compare the two groups on age, sentence length, education, IQ, and security classification (see Table 4). Using chi-square analyses, there were no significant relationships between GBC availability and marital status (χ^2 [1, n = 196] = .02, p = .88), occupation (χ^2 [3, n = 170] = 6.57, p = .09), ethnic background (χ^2 [2, n = 197] = 1.74, p = .42), or having a life sentence (χ^2 [1, n = 44] = .41, p > .05). However, there was a significant finding with discharge reason (χ^2 [3, n = 196] = 13.22, p = .004), indicating that individuals who did not have the GBC were more likely to have requested to leave treatment or been removed by staff. Almost three-quarters (73.3%) of those without the GBC completed treatment, while 89.2% with the GBC completed treatment.

Table 4

Comparisons of those with and without GBC on Demographic Variables

Demographics	GBC	No GBC	*t* test
Age	31.18 (67)	31.46 (131)	$t(196) = .21$
Sentence in months	86.88 (51)	85.00 (98)	$t(147) = -.21$
Education	10.03 (64)	9.51 (119)	$t(196) = -1.92$
IQ Percentile	31.65 (62)	34.71 (123)	$t(154.14) = .91$
Security Classification	22.60 (64)	21.48 (64)	$t(126) = -1.41$

Note: Numbers in parentheses represent number of individuals. All p values > .05.

The available GBC data were entered into the database. GBC data were available for 67 individuals. Of those, 39 completed the full 21-weeks of treatment, seven completed an abbreviated (approximately 11-week) treatment program, four individuals started late but completed the program, eight individuals completed the program but left the RPC early (approximately one or two weeks), two individuals started late and left early but were considered to have completed the program requirements, and seven individuals did not complete the program. Of the seven treatment noncompleters, three requested to leave the program, two were dismissed for misconduct, and two were paroled.

When dealing with individuals who were missing some GBC data (e.g., data were missing for one week of treatment), there were three possible alternatives: the complete case approach (i.e., include only those individuals who have every data point), case or variable deletion approach, and the imputation approach (Hair, Anderson, Tatham, & Black, 1998). The complete case approach was rejected since this would have reduced

the sample size substantially (from 67 to 39). The case or variable deletion approach was rejected because no variables or individuals were represented disproportionately in the missing data. The imputation approach was the most appealing option. It is the process of using empirical relationships that were identified in the sample's available data to estimate values for the missing data. For the current study, the regression imputation method was used and involved conducting stepwise regression analyses to estimate the value for an individual's missing GBC weekly variable (e.g., week 20) based on its relationship with other GBC weekly variables (e.g., weeks 18 and 19).

Individuals' scores on the SRS and VRS risk variables were found in their institutional files and entered into the database. When the VRS was not already completed, the researcher completed the scale based on a thorough review of the institutional files. The researcher was fully trained to complete this scale. Individuals were identified as being in one of the five stages of change (at pre- and post-treatment) based upon which stage was endorsed most frequently in the relevant VRS rating. The number of times each stage was identified for the dynamic VRS items was added up, and the stage with the highest number of occurrences determined the individual's stage membership. This is consistent with clinical practise at RPC. When two different stages tied for highest score, individuals were assigned to the less advanced stage.

The researcher was also fully trained in the use of the PCL-R and completed retrospective PCL-R ratings for each individual after a thorough review of their institutional files. The raters were blind to individuals' institutional misconduct and recidivism information while making these risk ratings.

In order to determine interrater reliability, a subsample of individuals (n = 45) were double-rated by a research assistant or a registered psychologist fully trained on the use of the VRS and PCL-R. Interrater reliability was determined through generating intraclass correlation coefficients (ICC). For the pre-treatment VRS total scores, the ICCs between the researcher and the two research assistants were .92 and .97. For the post-treatment VRS total scores, the ICCs between the researcher and the two research assistants were .94 and .95. For the PCL-R total scores, the ICCs between the researcher and the two research assistants were .97 and .95; the ICCs between the researcher and two psychologists were .94 and .93.

Individuals' post-treatment institutional charges and recidivism information were obtained from a review of each person's institutional and CPIC files and this data was entered into the new database. In order to avoid potential bias, this information was collected last.

Analyses

Some hypotheses required multiple statistical tests to be computed. However, Bonferroni error rates to control for chance significant results were not used for three reasons. First, reporting results in a standardized notational system (e.g., * = $p < .05$, ** = $p < .01$) made the information in different tables more directly comparable, whereas the notational systems for different Bonferroni error rates would vary from table to table and may be difficult to follow. Second, as mentioned by Stevens (1996), the use of Bonferroni error rates is most appropriate for large result sets (e.g., correlational matrix of 150 between-variable correlations) where a large number of results could be due to chance (e.g., 150 correlations x .05 error rate = 7.5 significant results by chance). In the

current study there are no such large result sets. Third, the treatment program upon which results were based was developed with a focus on clinical utility rather than research (e.g., individuals were selected on the basis of real-life need rather than to satisfy research protocols). As a result, the dataset will produce more "noisy" results than those from a research-driven treatment program. The use of Bonferroni error rates may compound the difficulties in uncovering true relationships. All analyses were conducted using the Statistical Package for Social Sciences for Windows Version 10.0 (SPSS).

Part 1: The URICA and Developing Cluster Profiles

The initial step was to generate pre- and post-treatment URICA stage mean scores, standard deviations, and internal consistencies. Inter-stage correlations (at both pre- and post-treatment) were generated using Pearson's *r*.

The results from the current study were then compared with those from other studies that used the URICA. Two-tailed independent *t* tests were used to compare the pre-treatment URICA mean stage scores with those from forensic and non-forensic samples. The comparison studies were DiClemente and Hughes (1990), Hemphill and Howell (2000), McConnaughy et al. (1983, 1989), McMurran et al. (1998), O'Hare (1996b), Pantalon and Swanson (2003), and Serin and Kennedy (1997). See Appendix B for a summary of these comparison studies.

The pre-treatment inter-stage correlations were compared with those from Hemphill and Howell (2000) and McConnaughy et al. (1983, 1989) using two-tailed *z* tests for independent correlation coefficients. The alpha coefficients for the pre-treatment URICA stages were compared with those from DiClemente and Hughes (1990), Hemphill and Howell (2000), McConnaughy et al. (1983, 1989), and Pantalon and Swanson (2003)

through visual inspection.

Hierarchical agglomerative cluster analyses using Ward's method were conducted on the four URICA stages (Precontemplation, Contemplation, Action, and Maintenance) to generate pre- and post-treatment cluster profiles. Cluster analysis is used to group objects together based on similar scores on the variables of interest in order to generate taxonomies, identify patterns of relationships and distinguish subgroups or clusters in larger samples (Hair, et al., 1998; Rapkin & Luke, 1993). The clusters that emerge can then be described using their profile of mean scores on each variable of interest (Rapkin & Luke, 1993). The quality of the cluster solution can be judged using several criteria: identification of distinct clusters that reliably classify the majority of cases, the interpretability of the mean score profile of each cluster, and the replicability of clusters across samples (Rapkin & Luke, 1993).

Aldenderfer and Blashfield (1984) outlined several topics that researchers should be cautious of when conducting cluster analysis. First, the choice of cluster analytic methods will influence the final results. Different techniques may produce different cluster results when applied to the same data set. Second, although the purpose of cluster analysis is to discover underlying structure in data, the method of operation is to impose structure on the data. As a result, cluster analysis can impose structure where none in fact exists. Third, cluster analysis methods are heuristics, or "plausible algorithms that can be used to create clusters of data" (p. 14). Given this level of abstractness, researchers should not reify their cluster solutions. Fourth, there is a lack of consensus among researchers on how to determine number of clusters in a cluster solution. The relative strengths and weaknesses of the cluster analysis method selected for the current study is

addressed below.

The cluster analyses for the current study were conducted using the five-step cluster analysis procedure described by Hair et al. (1998), which is nearly identical to the five steps outlined by Aldenderfer and Blashfield (1984). Step one is to state the objective of the cluster analysis. The purpose of the cluster analyses in this study was to develop an empirically-based classification of individuals using pre- and post-treatment stages of change (as operationalised by the URICA). The clustering variables selected for these analyses were the four stages of the URICA. There was one cluster analysis for pre-treatment data and one for post-treatment data.

In step two three decisions must be made. The first decision was how to identify outliers that can influence clustering results, the second was how to measure individuals' similarity, and the third was whether to standardize the clustering variables.

The univariate detection approach was used to detect outliers (Hair et al., 1998). This approach involved examining whether individuals' (transformed) *z* score clustering variable value was above (or below) a specific critical value. Since the sample sizes at pre- and post-treatment were greater than 80, a critical *z* score of +/- 3.5 for each stage score was chosen (Hair et al., 1998; Romesburg, 1990). It is important to identify outliers as clustering algorithms' performances deteriorate in the presence of outliers (Punj & Stewart, 1983). Any individual who had two or more stage scores exceed the critical value would be removed from subsequent analyses.

The squared Euclidian distance method was chosen to measure individuals' similarity on the clustering variables. The squared Euclidian distance is the sum of the squared differences between corresponding variables from each profile, or the square of

the measure of the length of a straight line drawn between two cases (Hair et al., 1998; Rapkin & Luke, 1993). The squared Euclidian distance is the most commonly used distance measure and it takes into account the three aspects of profiles: shape (the pattern of highs and lows across clustering variables), elevation (the absolute magnitude of the pattern of highs and lows across clustering variables), and scatter (distribution of scores around their average) (Borgen & Barnett, 1987; Gore, 2000).

URICA stage scores were standardized in order to control for differences among the means and standard deviations of the URICA stages (Borgen & Barnett, 1987; Milligan & Cooper, 1987; Romesburg, 1990). This was done because variables with larger standard deviations have greater influence in the clustering analysis (Hair et al., 1998). Standardization of data is also recommended when using the squared Euclidian distance (Everitt, 1974; Gore, 2000) and when the clustering algorithm being used is Ward's method (see below; Borgen & Barnett, 1987).

In step three of the cluster analysis, two issues were addressed: representativeness of the sample and multicollinearity. The current sample represented 71% of all inmates who were sent to the ABC program between October 1997 and April 2002. Since nearly three-quarters of individuals sent to the ABC program were included in the study, the current study's sample can be interpreted as being representative of all those who participated in the program. Multicollinearity involved examining whether the clustering variables used were correlated too highly with one another, resulting in one (or more) variables being explained by other variables in the cluster analysis. As multicollinearity increases, the results become more difficult to interpret because the variables' interrelationships make it more complicated to determine the effect of any single variable

(Hair et al., 1998). In order to test for multicollinearity, regression analyses must be conducted with each URICA stage being treated as a dependent variable and the remaining three stages treated as independent variables. The regression analysis data is then examined for three values: *R*, tolerance, and variance inflation factor (VIF). Tolerance is "the amount of variability of the selected independent variable not explained by the other independent variables" (Hair et al., 1998, p. 193); thus, as the tolerance value approaches zero the dependent variable is highly predicted (or collinear) with the independent variables. VIF is the inverse of tolerance, and thus large VIF values indicate a high degree of multicollinearity. An *R* value greater than .90, a tolerance value less than .10, and a VIF value greater than 10.0 are evidence for multicollinearity (Hair et al., 1998).

Step four involved the selection of a specific clustering algorithm and deciding upon a stopping rule for cluster formation (i.e., the final number of clusters to be formed). Ward's method (Ward, 1963) was chosen for the current study for two reasons. First, it provided the most direct way to compare the cluster analysis results from the current study with Prochaska and colleagues' past work since they used Ward's method in their research. Second, Ward's method has been found repeatedly to be among the most accurate when compared directly to other clustering techniques (e.g., Bayne, Beauchamp, Begovich, & Kane, 1980; Blashfield, 1976; Borgen & Barnett, 1987; Breckenridge, 2000; Milligan & Cooper, 1987; Mojena, 1977; Morey, Blashfield, & Skinner, 1983; Overall, Gibson, & Novy, 1993; Punj & Stewart, 1983).

Ward's method is a hierarchical agglomerative cluster procedure that uses the squared Euclidian distance as the measure of distance and was developed to "generate

clusters in such a way as to minimize the within-cluster variance" (Punj & Stewart, 1983, p. 139). According to Milligan and Cooper (1987), in hierarchical clustering methods each individual is considered as a cluster at the first step of analysis. At each successive clustering step, the two most similar clusters are merged until only one cluster (containing the entire dataset) remains. According to Hair et al. (1998), in Ward's method the distance between any two clusters is the sum of squares between the two clusters summed over all variables (the squared sum of the distances of each object from the mean value of the cluster). At each successive step in the clustering procedure, the cluster that results in the least increase in the sum of squares is generated by combining two clusters from the previous step (Gore, 2000; Hair et al., 1998). Ward's method suffers from two biases: a tendency to combine clusters that have small numbers of observations, and producing clusters that have similar number of observations (Hair et al., 1998).

In terms of the stopping rule for cluster formation, there are no standard objective selection procedures (Hair et al., 1998; Milligan & Cooper, 1985). According to Milligan and Cooper (1985), stopping with too few clusters is a more serious decision error than stopping with too many clusters because information is lost with the merging of distinct clusters. The approach recommended in the SPSS advanced statistical analysis manual (SPSS Inc, 2001) to determine the appropriate number of clusters is a version of the inverse scree test described by Lathrop and Williams (1987; 1989; 1990). When conducting cluster analyses, the SPSS output includes a set of clustering coefficient values within the default agglomerative schedule printout. The coefficient values "represent the squared Euclidian Distance between the two objects (or clusters) being joined. As such, small coefficients indicate that fairly homogenous clusters are being

joined, whereas larger values indicate that dissimilar clusters or objects are being joined" (Gore 2000; p. 316). The researcher looks for substantial relative change in the size of the coefficient value; this should indicate the optimal number of clusters. Other rules of thumb for determining the appropriate number of clusters include significant one-way ANOVA results on profile variables (i.e., clusters should differ significantly from each other on the variables used for clustering), an adequate number of individuals per cluster, and interpretability (Rapkin & Luke, 1993).

Step five of the cluster analysis involved an interpretation of the clusters. Each cluster was assigned a name that reflected accurately the nature of the cluster. To accomplish this, the clusters developed from this sample at pre- and post-treatment were compared with those developed by previous URICA researchers: Carney and Kivlahan (1995), DiClemente and Hughes (1990), Levesque et al. (2000), McConnaughy et al. (1989), and McConnaughy et al. (1983). Once this was accomplished, the pre- and post-treatment URICA cluster profiles were rank ordered from lowest (i.e., most resembling the Precontemplation stage) to highest (i.e., most resembling the Action or Maintenance stages), in order to use this ranking in correlational analyses.

One-tailed Spearman's r_s were calculated between the pre- and post-treatment cluster profile rankings and the pre- and post-treatment Self-deceptive Enhancement (SDE) and Impression Management (IM) subscales of the PDS.

Two-tailed Spearman's r_s were calculated between the pre- and post-treatment URICA cluster profile rankings and age and number of years of education. Chi-square analyses were conducted between the pre- and post-treatment cluster profiles and marital status (single, married/common-law), occupation (white collar, blue collar, labour, other),

and race (Caucasian, Aboriginal, other).

Part 2: Indicators of Change During Treatment

Descriptive statistics were calculated for individuals' pre- and post-treatment scores on the self-report measures and the risk measures. Movement of scores would indicate that change had occurred in the context of treatment attendance and provide support for examining the relationships between the cluster profile rankings and these measures. The significance of changes in scores was tested using paired-sample *t* tests.

Two-tailed Pearson's *r* were calculated between the pre- and post-treatment IM and SDE subscales and pre- and post-treatment scores on the URICA, STAXI, CSS-M, and the RPI. Significant correlations would indicate the presence of deceptive or socially desirable responding and suggest a cautious approach to interpreting self-report measures.

Next, individuals' behaviour during the ABC treatment was evaluated. In order to generate a statistically manageable GBC variable, three steps were taken. First, the ten daily treatment variables from the GBC were averaged in order to create one variable of averaged daily group behaviour per individual. Second, the five averaged daily group behaviour ratings were averaged in order to create one variable of weekly group behaviour per individual. Third, the weekly group behaviour ratings were averaged across individuals in order to create one variable of overall weekly group behaviour (i.e., an average of how all individuals performed in the same week of treatment). This results in the variable referred to in the current study as "GBC".

A linear regression analysis was conducted to identify whether GBC scores increased as time in treatment progressed. In addition, the data were plotted graphically. A positive slope would support using the GBC scores as indicators of change due to

treatment and therefore appropriate for further analyses to aid in the validation of the cluster profiles.

Part 3: Relationships Between Cluster Profile Rankings and Self- and Staff-report Treatment Process Variables, Risk Variables, and Outcome Variables

One-tailed Spearman's r_s were calculated between the pre- and post-treatment cluster profile rankings and the pre- and post-treatment STAXI subscales and CSS-M subscales.

One-tailed partial correlations were calculated between the pre- and post-treatment cluster profile rankings and the pre- and post-treatment RPI scores (after controlling for IQ scores).

Chi-square analyses were conducted between the pre- and post-treatment URICA cluster profiles and reason for discharge (patient request, treatment complete, paroled, removed by treatment staff).

Next, the relationship between the cluster profiles and treatment progress was investigated. A linear regression was computed in order to determine whether individuals in more advanced cluster profiles received higher GBC scores throughout treatment. The GBC weekly averages were graphed on the basis of first and second halves of treatment to highlight the differences between cluster profiles.

Cluster profile rankings were examined in terms of their relationships to risk-related measures. It was expected that the cluster profile rankings would correlate negatively with PCL-R, SRS, and VRS scores. One-tailed Spearman's r_s were calculated between the pre- and post-treatment URICA cluster profile rankings and PCL-R total,

Factor 1, Factor 2 scores, SRS total and category scores, and VRS total, static, and dynamic scores.

Further analyses were conducted exploring the relationship of PCL-R scores with the other variables (presented in Appendix F). One-tailed Pearson's *r* were calculated between PCL-R scores (total, Factor 1, Factor 2) and the pre- and post-treatment VRS scores (static, dynamic, total). Psychopaths were compared to nonpsychopaths on the VRS variables using one-tailed independent *t* tests. One-tailed Pearson's *r* were also calculated between PCL-R scores (total, Factor 1, Factor 2) and the SRS scores (total and category scores). Psychopaths were compared to nonpsychopaths on the SRS variables using one-tailed independent *t* tests. One-tailed Pearson's *r* were calculated between PCL-R scores (total, Factor 1, Factor 2) and weekly GBC scores. Psychopaths were compared to nonpsychopaths on the GBC scores using one-tailed independent *t* tests. Linear regression analyses were conducted for psychopaths and nonpsychopaths to identify whether GBC scores increased as time in treatment progressed. One-tailed Pearson's *r* were calculated between PCL-R scores (total, Factor 1, Factor 2) and the amount of nonviolent and violent institutional misconduct post-RPC incarceration, and any recidivism if released to the community. One-tailed Pearson's *r* were also calculated between PCL-R scores (total, Factor 1, Factor 2) and the time to the first institutional misconduct and/or community recidivism. Psychopaths were compared to nonpsychopaths on all the preceding variables using one-tailed independent *t* tests.

The relationships between the cluster profile rankings and criminal behaviour were also explored. One-tailed partial correlations (controlling for VRS total score) were calculated between the pre- and post-treatment cluster profile rankings with amount of

nonviolent and violent institutional misconduct following treatment at RPC and any recidivism if released to the community.

One-tailed partial correlations (controlling for VRS total score) were calculated between the pre- and post-treatment cluster profile rankings and the time to first institutional misconduct following treatment at RPC and community recidivism.

Part 4: Comparison of Cluster Profiles and VRS

Individuals were placed into discrete stages of change using the VRS (for both pre- and post-treatment). One-tailed Spearman's r_s were calculated between cluster profile rankings and VRS stages at pre- and post-treatment. The same correlational analyses conducted for cluster profile rankings in Part 3 were conducted for the pre- and post-treatment VRS stages. The strengths of these two sets of correlations (i.e., correlations with profile cluster rankings and correlations with VRS stages) were compared using Hotelling's T analyses for nonindependent correlations.

CHAPTER 3: RESULTS

Part 1: The URICA and Developing Cluster Profiles

Summary: In Part 1 the psychometric properties of the URICA were explored. Overall, the mean scores, inter-stage correlations, and internal consistencies of the URICA were similar to those found in past research. Five-cluster solutions were generated through cluster analyses for the URICA at both pre- and post-treatment, and each cluster had been found in previous research. Pre- and post-treatment cluster profiles were ranked in an ascending order that reflected progression in readiness for change. The rankings were based on previous research as well as an understanding of which stages of change were represented by each cluster profile. There was evidence of movement between the profiles when individuals' cluster profile memberships were compared at pre- and post-treatment. Cluster profiles were independent of demographic information for this sample, with the exception that Aboriginal offenders tended to be in less advanced clusters at pre-treatment. There was no evidence for the cluster profiles to be related to socially desirable responding. Overall, these results indicated that the URICA's application to an offender population was psychometrically similar to its application to a health psychology population (e.g., Prochaska & Norcross, 1994).

Section I: Psychometric Properties

Hypothesis: The URICA's mean scores, inter-stage correlations, and internal consistencies will be similar to those found in past research.

The pre- and post-treatment URICA stage mean scores, standard deviations, and internal consistencies are presented in Table 5. The alpha coefficients were in the moderate range, suggesting an acceptable level of internal consistency for each stage.

Table 5

Pre- and Post-treatment URICA Psychometric Properties

	Pre-treatment (n = 192)				Post-treatment (n = 129)			
URICA Stage Scores	Total	M	SD	Alpha	Total	M	SD	Alpha
Precontemplation	15.22	1.90	.56	.79	14.38	1.79	.57	.84
Contemplation	34.73	4.34	.41	.76	34.98	4.37	.41	.76
Action	33.72	4.21	.41	.72	35.28	4.40	.38	.72
Maintenance	26.33	3.29	.56	.69	26.31	3.28	.59	.67

Two-tailed independent t tests were used to compare the pre-treatment URICA's mean stage scores with those from the following studies: DiClemente and Hughes (1990), Hemphill and Howell (2000), McConnaughy et al. (1983, 1989), McMurran et al. (1998), O'Hare (1996b), Pantalon and Swanson (2003), and Serin and Kennedy (1997). As shown in Table 6, the mean pre-treatment URICA stage scores are most similar to those from McConnaughy et al. (1983, 1989), Hemphill and Howell (2000), and O'Hare (1996b). A review of the studies listed in Table 6 showed a range of mean stage scores. This range is expected given the diversity of populations and problems represented in these studies (e.g., Carey et al., 1999). The current study's mean stage scores generally fall within the ranges established by previous researchers. However, the mean pre-treatment URICA Action score from the current study is significantly greater than the mean URICA Action score from each comparison study.

Table 6

Comparison of Mean Pre-treatment URICA Stage Scores Across Studies

	Precontemplation	Contemplation	Action	Maintenance
Current study	1.90	4.34	4.21	3.29
DiClemente & Hughes (1990) [*t* (414)]	1.46****	3.91****	3.49****	3.29
Hemphill & Howell (2000) [*t* (415)]	2.05*	4.32	3.85****	3.58****
McConnaughy et al., (1983) [*t* (345)]	1.95	4.26	3.92****	3.34
McConnaughy et al., (1989) [*t* (513)]	2.02	4.28	3.91****	3.66****
McMurran et al. (1998) [*t* (305)]	2.59****	3.84****	3.89****	3.51***
O'Hare (1996b) [*t* (566)]	2.01	4.16****	3.84****	3.41
Pantalon & Swanson (2003) [*t* (310)]	2.18****	4.27	4.05***	3.88****
Serin & Kennedy (1997) [*t* (262)]	1.83	1.57****	.41****	1.87****

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

The alpha coefficients from the current study's pre-treatment URICA stages were compared with those reported by DiClemente and Hughes (1990), Hemphill and Howell (2000), McConnaughy et al. (1983), McConnaughy et al. (1989), and Pantalon and Swanson (2003). All alpha coefficients are reproduced in Table 7. The alpha coefficients from the current study were similar to those from other studies, although the Maintenance alpha was noticeably lower.

Table 7

Comparison of Pre-treatment URICA Alpha Coefficients Across Studies

	Precontemplation	Contemplation	Action	Maintenance
Current study pre-treatment	.79	.76	.72	.69
DiClemente & Hughes (1990)	.69	.75	.82	.80
Hemphill & Howell (2000)	.80	.87	.87	.83
McConnaughy et al., (1983)	.88	.88	.89	.88
McConnaughy et al., (1989)	.79	.84	.84	.82
Pantalon & Swanson (2003)	.78	.76	.82	.83

Although an alpha coefficient of .69 is considered to be at the lower bounds of an acceptable level, post hoc analyses were conducted in order to further explore the lower alpha coefficient for the Maintenance stage (see Appendix C). It was hypothesized that the lower alpha may be due to wording changes that were made to the URICA in order to make it easier to read for this population. The interitem correlations were explored. The mean interitem correlation was .22, ranging from a high of .35 to a low of -.07. The largest increase in the alpha coefficient occurred when item 27 was deleted ("I am trying hard to prevent myself from having a relapse of my problem"); the alpha coefficient increased to .70. These results suggest that there is no one item that is causing a reduction in the alpha since all interitem correlations are relatively low and the overall alpha coefficient does not increase noticeably if items are removed from the analyses.

Given the above findings, further post hoc exploration focused on the hypothesis that there may have been something unusual about the individuals whose scores were used in the analysis. First, it was hypothesized those individuals who competed pre- but

not post-testing may not have been similar to the rest of the sample. This lack of similarity may be responsible for the lower alpha coefficient. In order to test this, the sample size was reduced (n = 123) to include only those individuals who had both pre- and post-treatment URICA scores. The alpha coefficient for this reduced sample was .71. Since this alpha coefficient did not differ greatly from that of the larger sample it was concluded that individuals not completing the post-treatment URICA were not responsible for the lower Maintenance stage alpha coefficient.

Second, it was hypothesized that individuals who were more ready for change would produce a higher alpha coefficient on the URICA scales than individuals who were less ready for change. Individuals were grouped into being more advanced or less advanced based on their cluster profiles developed in Section II of Part 1 of this dissertation. The Decision-making, Preparticipation, and Participation cluster profiles were grouped together as more advanced, while the Immotive and Precontemplative cluster profiles were grouped together as less advanced. For all URICA stage scores (Precontemplation, Contemplation, Action, and Maintenance), the alpha coefficient was higher for individuals in the more advanced cluster profiles than for individuals in the less advanced cluster profiles (see Appendix C). This suggests that there was a systematic difference in how individuals in the more and less advanced profiles answered the URICA.

One possible explanation was that the individuals in more advanced profiles were better able to understand the questions on the URICA. This post hoc hypothesis was tested by comparing the intelligence score (from the Quick Test) for individuals in the more and less advanced profiles. A t test showed a significant difference between the two

groups with individuals in the more advanced profiles having higher IQ scores (t (179) = -2.33, p = .021). This suggested that individuals in the more advanced profiles would be better able to read and understand the URICA items and raised the question of the readability of each of the URICA stages. The grade level of the writing for each of the URICA stages was explored using the Flesch-Kincaid Grade Level (Coh-Metrix Project, 2003). The Maintenance stage was found to have the highest grade level at 6.5, Action was 5.0, Contemplation was 4.1, and Precontemplation was 3.1. Overall, these post hoc analyses suggest that the lower Maintenance stage alpha coefficient found in this study may be a result of the higher grade level needed to understand the Maintenance questions interacting with the relatively low interitem correlations. However, an alpha coefficient of .69 can be considered acceptable and therefore allows for further analyses of the URICA.

The one-tailed inter-stage correlations of the pre- and post-treatment URICA stages are presented in Table 8. The direction of inter-stage correlations was as expected, with the Precontemplation stage correlated negatively with the other stages. The only exception was the weak positive correlation between Precontemplation and Maintenance at post-treatment.

Table 8

Pre- and Post-treatment URICA Inter-stage Correlations

Pre-treatment			
	Contemplation	Action	Maintenance
Precontemplation	-.53****	-.51****	-.10
Contemplation	-	.64****	.33****
Action	-	-	.27****
Post-treatment			
	Contemplation	Action	Maintenance
Precontemplation	-.37****	-.37****	.04
Contemplation	-	.71****	.39****
Action	-	-	.31****

**** $p < .001$.

Inter-stage correlations from the current study's pre-treatment URICA stages were compared with those reported by Hemphill and Howell (2000), and McConnaughy et al. (1983, 1989) using two-tailed z tests for independent correlation coefficients. Thirteen of the 18 comparisons did not differ significantly (see Table 9). Thus, the inter-stage correlations from the current study were similar to those from other studies.

Overall, the hypothesis was supported. The psychometric data for the URICA in the current study were similar to those from previous studies. The most significant difference was the comparatively high Action stage score from the current study in comparison with that from other studies.

Table 9

Comparison of Pre-treatment URICA Inter-stage Correlations Across Studies

URICA Stages	Current Study	McConnaughy et al., (1983)	McConnaughy et al., (1989)	Hemphill & Howell (2000)
PC / C	-.53	-.45	-.52	-.68
PC / A	-.51	-.16****	-.23****	-.41
PC / M	-.10	.05	-.22	-.42****
C / A	.64	.53	.50	.59
C / M	.33	.27	.45	.64****
A / M	.27	.38	.48**	.46

Note: Numbers represent the correlations reported in the comparison studies. PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance.

** $p < .01$. **** $p < .001$.

Section II: Cluster Analysis of Pre-treatment URICA

Hypothesis: Distinct profiles can be developed by cluster analysing the URICA factor scores at pre-treatment.

Step one of the cluster analysis was a theoretical question that was addressed in the Methods section. In step two of the cluster analysis, the pre-treatment URICA data was checked for outliers. Using the univariate detection approach, each individual's four stage scores were transformed into *z* scores and the data was examined for values exceeding the critical *z* score of +/- 3.5 (Hair et al., 1998; Romesburg, 1990). One individual's Precontemplation stage score was high, and another individual's Action score was low. Since each individual only exceeded the critical value for one of four stage scores, neither was excluded from the database. The next part in step two was to

standardize the data. Pre-treatment URICA stage scores were transformed to *T* scores to facilitate comparisons with Prochaska's earlier work.

In step three of the cluster analysis the representativeness of the sample was examined. The current sample represented 71% of all patients who were in the ABC treatment program between October 8, 1997 and April 17, 2002. The 29% of patients who were not included in this sample did not complete the URICA at either pre- or post-treatment. Unfortunately, no demographic data were available for these individuals and as a result they could not be compared statistically with those who were included in the study. There were several reasons why these individuals may not have completed the URICA (e.g., unavailability of psychological technician, patients declined participation). Since there did not appear to be a systematic reason why these people did not complete the URICA, it was decided that the current sample was representative of the entire population.

The possibility of multicollinearity was also examined at step three. As reported above, the pre-treatment URICA stages were significantly intercorrelated (with the exception of the Precontemplation – Maintenance correlation). The presence of multiple significant correlations indicated the need to test for multicollinearity. Regression analyses were performed with each stage being treated as a dependent variable and the remaining three stages treated as independent variables. The regression analysis data was then examined for three pieces of information: multiple correlation (*R*), tolerance, and variance inflation factor (VIF) values. An *R* greater than .90, a tolerance value less than .10, and a VIF value greater than 10.0 are evidence for multicollinearity (critical values are from Hair et al., 1998). None of the pre-treatment URICA stages produced scores

exceeding critical levels (see Table 10). As a result, it was concluded that there was no evidence for multicollinearity and each stage was entered as a clustering variable into the cluster analysis.

Table 10

Testing for Multicollinearity

Dependent Variable	Independent Variable	Tolerance	VIF	*R*
PC	C	.56	1.79	.58
	A	.58	1.72	
	M	.89	1.13	
C	PC	.74	1.35	.71
	A	.70	1.43	
	M	.93	1.08	
A	PC	.72	1.39	.68
	C	.65	1.55	
	M	.88	1.13	
M	PC	.68	1.48	.35
	C	.53	1.88	
	A	.55	1.83	

Note: PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance

Step four involved the application of Ward's method to the pre-treatment URICA data (192 individuals). The agglomeration schedule table containing clustering coefficients for pre-treatment data was examined to start the process of determining the most appropriate number of clusters. The relevant information is reproduced in Table 11. The absolute value of the clustering coefficient showed large increases between one and eight clusters (e.g., going from two clusters to one is 764 - 493.86 = 270.14). In order to identify large relative increases in cluster homogeneity, the percentage of change in the clustering coefficient for one to eight clusters was calculated (e.g., for two clusters to one

cluster, 270.14/493.86 = 54.7%). The percentage of change in the clustering coefficients column was examined for large increases between values. Large increases would suggest that dissimilar clusters were combined. For example, the coefficient change going from six clusters to five is 10.9% and from five clusters to four is 13.4%, for a difference of 2.5%. This increase is relatively large suggesting that combining five clusters into four might not be appropriate. The one and two cluster solutions were discarded as they lacked theoretical and/or statistical usefulness. Thus, there was a possibility of a three, five, or seven cluster solution for the pre-treatment data.

Table 11

Analysis of Agglomeration Coefficient for Ward's Method

Number of Clusters	Agglomeration Coefficient	Coefficient Change to Next Lower Level	% Coefficient Change to Next Lower Level	Percentage Difference
9	230.15	19.05	8.2%	0.1%
8	249.20	21.57	8.7%	0.5%
7	270.77	28.88	10.7%	2.0%
6	299.65	32.52	10.9%	0.2%
5	332.17	44.61	13.4%	2.5%
4	376.78	46.38	12.3%	1.1%
3	423.16	70.70	16.7%	4.4%
2	493.86	270.14	54.7%	38.0%
1	764.00	-	-	-

The next phase in determining the most appropriate number of clusters was to conduct one-way ANOVAs on the clustering variables (Precontemplation, Contemplation, Action, and Maintenance stages) for each possible solution to determine

which solution showed the largest percentage of differences (i.e., differences in clustering variables between clusters). Significant *F* values were found for each stage in each solution (see Table 12).

Table 12

Oneway ANOVA Comparisons of Possible Cluster Solutions

Cluster Solution	Stage	*df*	*F*
3	PC	2	87.71****
	C	2	103.30****
	A	2	71.96****
	M	2	50.57****
5	PC	4	74.24****
	C	4	58.92****
	A	4	52.26****
	M	4	59.96****
7	PC	6	66.73****
	C	6	47.62****
	A	6	49.77****
	M	6	63.74****

Note: PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance

**** $p < .001$.

Next, Tukey's HSD analyses were conducted on the three, five, and seven cluster solutions. As shown in Table 13, each of the three, five, and seven cluster solutions had numerous significant comparisons (92%, 83%, and 81%, respectively).

Table 13

Tukey's HSD Comparisons

3 Cluster Solution 11/12 or 92% of comparisons are significantly different			
PC	C	A	M
1.38_{a}	4.51_{a}	4.31_{a}	3.02_{a}
1.59_{b}	4.76_{b}	4.62_{b}	3.85_{b}
2.26_{c}	4.07_{c}	3.98_{c}	3.12_{a}
5 Cluster Solution 33/40 or 83% of comparisons are significantly different			
PC	C	A	M
1.38_{a}	4.51_{a}	4.31_{a}	3.02_{a}
1.96_{b}	4.65_{a}	4.41_{a}	3.87_{b}
2.26_{c}	4.00_{b}	3.91_{b}	2.77_{c}
2.26_{c}	4.14_{b}	4.05_{b}	3.48_{c}
1.16_{a}	4.88_{c}	4.87_{c}	3.83_{b}
7 Cluster Solution 68/84 or 81% of comparisons are significantly different			
PC	C	A	M
1.07_{a}	$4.67_{a, b}$	$4.64_{a, b}$	2.28_{a}
1.96_{b}	$4.65_{a, b}$	$4.41_{a, c}$	3.87_{b}
$2.07_{b, c}$	4.13_{c}	4.05_{d}	2.70_{c}
2.26_{c}	4.14_{c}	4.05_{d}	3.48_{d}
1.47_{d}	4.46_{a}	$4.22_{c, d}$	3.24_{d}
2.58_{e}	3.80_{d}	3.67_{e}	2.88_{c}
1.16_{a}	4.88_{b}	4.87_{b}	3.83_{b}

Note: PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance. Means in the same column that do not share subscripts differ at $p < .05$ in the Tukey HSD comparison.

The next phase in determining the most appropriate number of clusters was to examine the number of individuals in each cluster for every solution. In the three cluster solution there were clusters of 102, 40, and 50 individuals. In the five cluster solution there were clusters of 40, 27, 51, 51, and 23 individuals. For the seven cluster solution, there were clusters of 9, 27, 32, 51, 31, 19, and 23 individuals. The seven cluster solution produced two clusters of smaller size, which may pose a problem for statistical analyses (i.e., lack of power).

It was decided that the five cluster solution was the best choice. It was superior to the seven cluster solution on statistical bases. The five cluster solution had a larger percentage change in the clustering coefficient than the seven cluster solution (2.5% versus 2.0%) and a greater percentage of significant post-hoc comparisons than the seven cluster solution (83% versus 81%). The seven cluster solution produced two clusters that each captured less than 10% of the sample. In addition, outliers (i.e., clusters of one individual each) began to appear when the cluster analyses were taken beyond seven clusters; this may indicate that a seven cluster solution was the upper limit for this sample and may not be replicable.

The three cluster solution outperformed the five cluster solution in a statistical sense. The three cluster solution had a larger percentage change in the clustering coefficient than the five cluster solution (4.4% versus 2.5%) and a greater percentage of significant post-hoc comparisons than the five cluster solution (92% versus 83%).

However, the five cluster solution was chosen as being more appropriate for several reasons. First, the five cluster solution was more clinically interesting. The TTM is a model of change (i.e., movement), and the five cluster solution allowed for a more fine-grained examination of individuals' progression and regression through the cluster profiles (i.e., a four-step process rather than a two-step process). Second, the three cluster solution produced one cluster that contained more than half of the individuals (i.e., every precontemplative-type individual), which is not typical in prior research. Past studies indicated the existence of multiple precontemplative-type cluster profiles. Third, having so many individuals in one cluster in the three cluster solution may produce statistical problems for correlational analyses (i.e., restricted range) resulting in Type II errors. This is similar to Milligan and Cooper's (1985) concern that generating too few clusters in cluster analysis is a more serious error than producing too many clusters, because information is lost when distinct clusters are merged.

Overall, the hypothesis that cluster profiles could be developed for pre-treatment URICA data was supported.

Section III: Ranking the Cluster Profiles

Hypothesis: The cluster profiles will be similar to those found in previous research and can be "ranked" in terms of least to most ready to change.

Step five of the cluster analysis involved an interpretation of the five cluster solution. The standardized *T* scores for each stage and percentage of individuals placed into each cluster generated in this study are presented in Table 14.

Table 14

Standardized Stage *T* scores

Cluster Profile	PC *T* score	C *T* score	A *T* score	M *T* score	*n*	% of total sample
Immotive	56.4	45.1	45.9	53.3	51	27%
Precontemplative	56.3	41.8	42.6	40.7	51	27%
Decision-making	40.6	54.0	52.3	45.2	40	21%
Preparticipation	50.9	57.4	54.6	60.1	27	14%
Participation	36.7	63.0	65.7	59.4	23	12%

The ranking of cluster profiles from least to most advanced was determined after consideration of three factors: Levesque et al.'s (2000) study that ranked URICA-DV cluster profiles; other researchers' (e.g., McConnaughy et al., 1983, 1989) descriptions of cluster profiles; and which stage scores were low, average, or high in each of the cluster profiles developed in the current study.

The cluster profiles are presented in Figures 1 to 5 from least advanced to most advanced. The profile in Figure 1 was labelled "immotive" due to its similarity in shape and elevation to the profile labelled "immotive" by McConnaughy et al. (1983, 1989), and "precontemplative" by Carney and Kivlahan (1995). This profile appeared to be the least advanced due to its below average scores on Contemplation and Action, and its above average scores on Precontemplation and Maintenance. It appeared that individuals in this profile were maintaining a pattern of not acknowledging the presence of their problems, and were neither thinking nor acting in a way to produce prosocial change. The immotive profile could correspond to being in the very early portion of the Precontemplation stage.

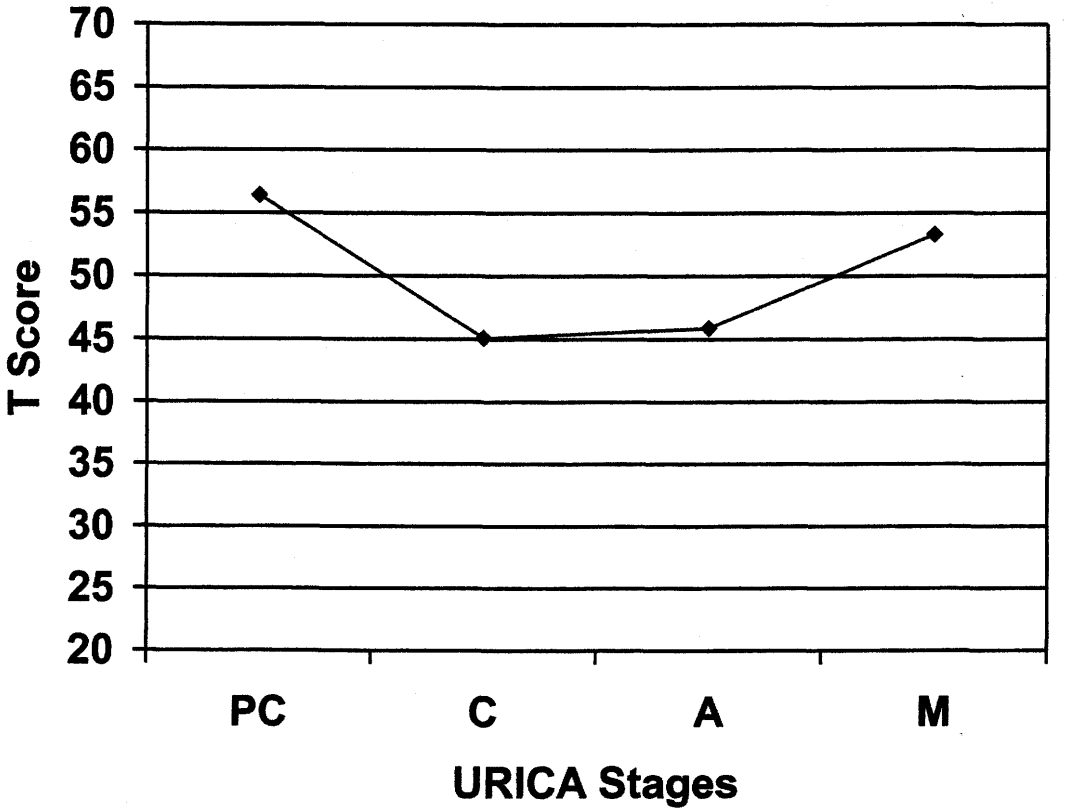

Figure 1. Immotive profile.

The profile in Figure 2 was labelled as "precontemplative" due to its similarity in shape and elevation to the profile labelled "precontemplative" by DiClemente and Hughes (1990). The precontemplative profile was the next most advanced. While the Precontemplation, Contemplation, and Action stage scores were similar to the Immotive profile, the Maintenance stage was lower; thus, there may be less propensity to maintain a lack of change. Although these individuals were not thinking about changing, they may have been more open to considering change than individuals in the "immotive" profile. This profile could correspond to being in the middle or later portions of the Precontemplation stage.

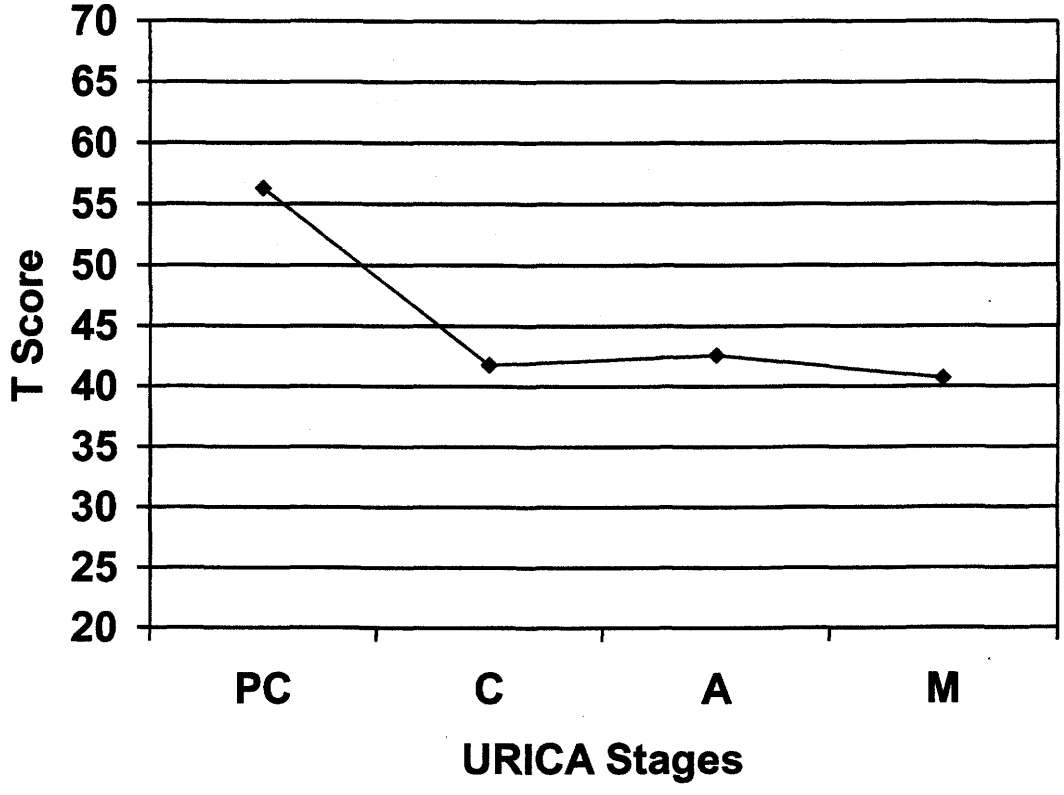

Figure 2. Precontemplative profile.

The profile in Figure 3 was labelled "decision-making" as it was most similar in shape and elevation to the profile labelled "decision-making" by McConnaughy et al. (1983, 1989), and Levesque et al. (2000). The highest stage scores for this profile were Contemplation and Action, with the Precontemplation and Maintenance stages being below average. This could be interpreted as meaning that individuals within this profile were seriously considering making prosocial changes in their lives but had not done so. The decision-making profile could correspond to being in the later portion of the Contemplation stage or the early portion of the Preparation stage.

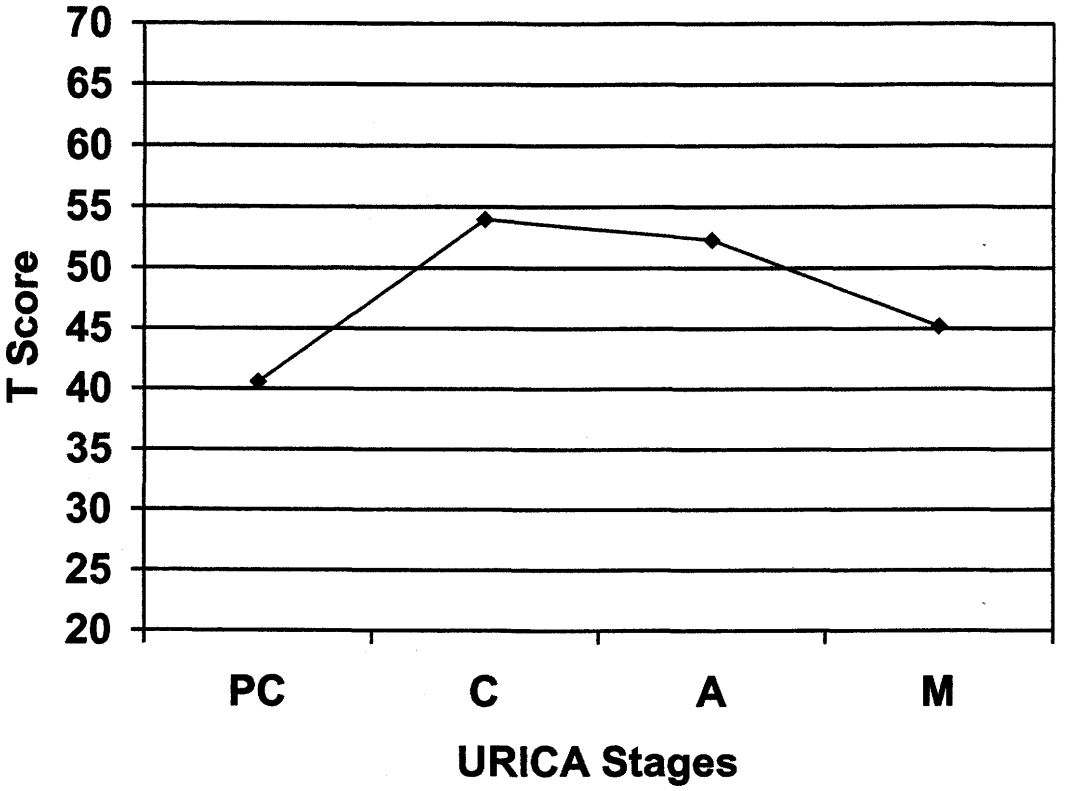

Figure 3. Decision-making profile.

The profile in Figure 4 was labelled "preparticipation" due to its similarity in shape and elevation to the profile labelled "preparticipation" by Levesque et al. (2000) and "maintenance" (of lack of change) by McConnaughy et al. (1989). Preparticipation was the next most advanced profile as it is similar to the "decision-making" profile but with an elevated Maintenance stage score; this could indicate that individuals were committing to making some form of behavioural change. This profile could correspond to being in the middle or later portions of the Preparation stage or the very early portion of the Action stage.

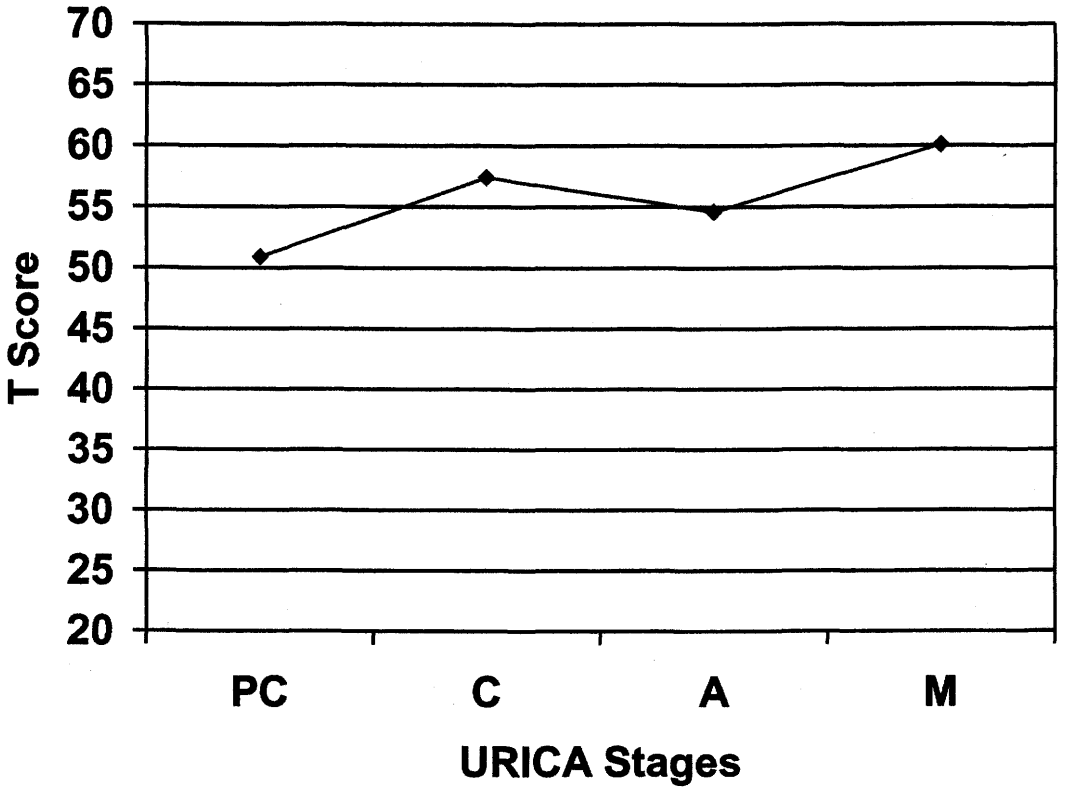

Figure 4. Preparticipation profile.

The profile in Figure 5 was labelled "participation" due to its similarity in shape and elevation to the profile labelled "participation" by Carney and Kivlahan (1995), DiClemente and Hughes (1990), Levesque et al. (2000), McConnaughy et al. (1983, 1989). This was the most advanced profile as the Precontemplation stage was well below average and the Contemplation, Action, and Maintenance stages were well above average. Individuals in this profile were likely making and maintaining some type of changes to their lifestyles. The participation profile could correspond to being in the Action stage of change.

All of the profiles generated were similar to those found in previous research, and they were rank-ordered based on past research. Thus, this hypothesis was supported.

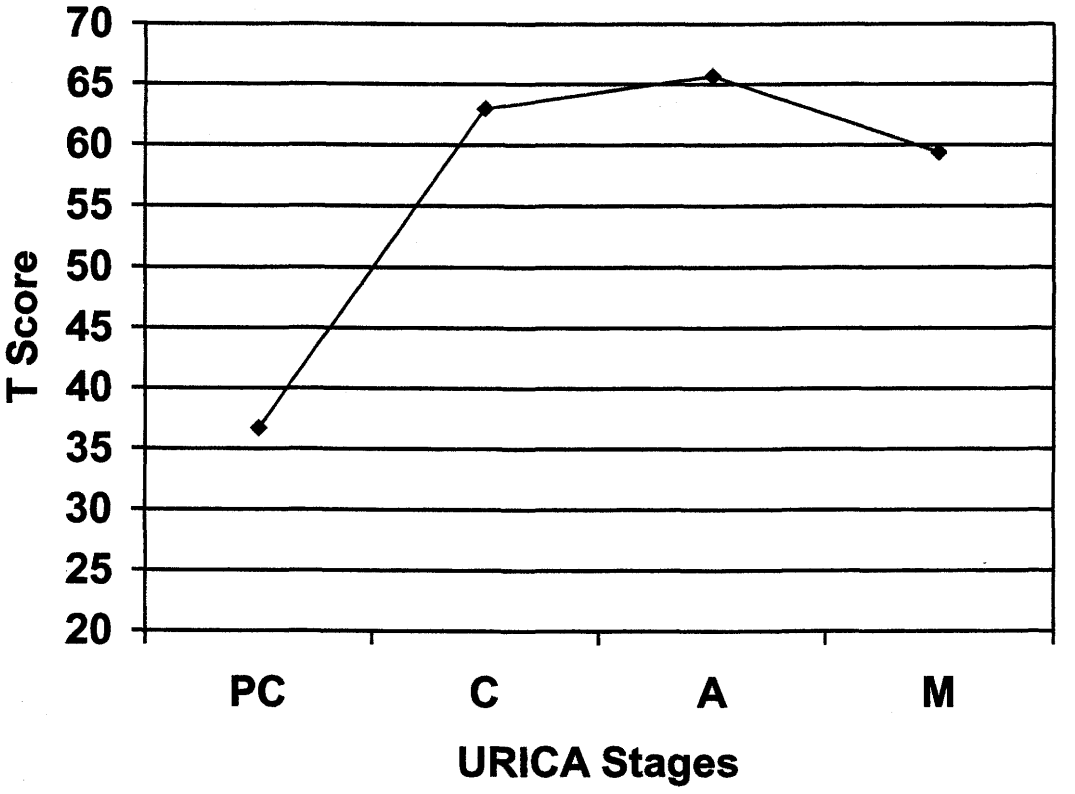

Figure 5. Participation profile.

Section IV: Cluster Analysis of Post-treatment URICA

Hypothesis: Distinct profiles can be developed by cluster analysing the URICA factor scores at post-treatment.

The five steps of cluster analysis described above were repeated for the post-treatment URICA data. In step two, the post-treatment URICA data was checked for outliers. No outliers were found and therefore all data were transformed to *T* scores to facilitate comparisons with Prochaska's earlier work.

The possibility of multicollinearity was examined at step three. Regression analyses were performed with each stage being treated as a dependent variable and the remaining three stages treated as independent variables. The regression analysis data were then examined for *R*, tolerance, and VIF values above the critical values described previously. As shown in Table 15, none of the post-treatment URICA stages produced scores exceeding critical levels. As a result, it was concluded that there was no evidence for multicollinearity and that each stage should be entered as a clustering variable into the cluster analysis.

Table 15

Testing for Multicollinearity Post-treatment

Dependent Variable	Independent Variable	Tolerance	VIF	*R*
PC	C	.47	2.15	.45
	A	.50	2.01	
	M	.84	1.19	
C	PC	.84	1.19	.75
	A	.76	1.32	
	M	.88	1.14	
A	PC	.82	1.21	.72
	C	.70	1.43	
	M	.81	1.24	
M	PC	.84	1.19	.45
	C	.49	2.06	
	A	.49	2.06	

Note: PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance

Step four involved the application of Ward's method to the post-treatment URICA data (129 individuals). The agglomeration schedule table containing clustering coefficients for post-treatment data was examined to start the process of determining the most appropriate number of clusters. The relevant information is reproduced in Table 16. The absolute value of the clustering coefficient showed large increases between one and six clusters (e.g., going from two clusters to one is 512 – 328.05 = 183.95). In order to identify large relative increases in cluster homogeneity, the percentage of change in the clustering coefficient for one to six clusters was calculated (e.g., for two clusters to one cluster, 183.95/328.05 = 56.1%). The percentage of change in the clustering coefficients column was examined for large increases between values. Large increases would suggest that dissimilar clusters were combined. For example, the coefficient change going from

six clusters to five is 15.1% and from five clusters to four is 21.6%, for a difference of 6.5%. This increase is relatively large suggesting that combining five clusters into four might not be appropriate. The one and two cluster solutions were discarded since they lacked theoretical and/or statistical usefulness. Thus, there is a possibility of a three, four, five, or six cluster solution for the post-treatment data.

Table 16

Analysis of Agglomeration Coefficient for Ward's Method Post-treatment

Number of Clusters	Agglomeration Coefficient	Coefficient Change to Next Lower Level	% Coefficient Change to Next Lower Level	Percentage Difference
9	123.00	11.21	9.1%	1.7%
8	134.21	11.72	8.7%	0.4%
7	145.93	15.39	10.5%	1.8%
6	161.32	24.30	15.1%	4.6%
5	185.62	40.13	21.6%	6.5%
4	225.75	42.61	18.9%	2.7%
3	268.36	59.69	22.2%	3.3%
2	328.05	183.95	56.1%	33.9%
1	512.00	-	-	-

The next part involved conducting one-way ANOVAs on the clustering variables (Precontemplation, Contemplation, Action, and Maintenance stages). This was done for each possible solution to determine which solution showed the largest percentage of differences (i.e., differences in clustering variables between clusters). Significant *F* values were found for each stage in each solution (see Table 17).

Table 17

Oneway ANOVA Comparisons of Possible Cluster Solutions Post-treatment

Cluster Solution	Stage	*df*	*F*
3	PC	2	36.69****
	C	2	85.23****
	A	2	82.76****
	M	2	40.74****
4	PC	3	24.26****
	C	3	59.96****
	A	3	64.05****
	M	3	85.55****
5	PC	4	49.55****
	C	4	44.76****
	A	4	61.30****
	M	4	65.80****
6	PC	5	39.41****
	C	5	62.04****
	A	5	57.29****
	M	5	59.74****

Note: PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance

**** $p < .001$.

Next, Tukey's HSD analyses were conducted for each cluster solution. Each of the three, four, five, and six cluster solutions had numerous significant comparisons (83%, 79%, 83%, and 77%, respectively [see Table 18]).

Table 18

Tukey's HSD Comparisons Post-treatment

3 Cluster Solution 10/12 or 83% of comparisons are significantly different			
PC	C	A	M
1.43_{a}	4.69_{a}	4.72_{a}	3.39_{a}
2.17_{b}	4.18_{b}	4.16_{b}	3.44_{a}
1.84_{c}	3.81_{c}	4.10_{b}	2.22_{b}
4 Cluster Solution 19/24 or 79% of comparisons are significantly different			
PC	C	A	M
1.43_{a}	4.65_{a}	4.66_{a}	3.11_{a}
2.17_{b}	4.18_{b}	4.16_{b}	3.44_{b}
1.84_{b}	3.81_{c}	4.10_{b}	2.22_{c}
1.44_{a}	4.81_{a}	4.91_{c}	4.16_{d}
5 Cluster Solution 33/40 or 83% of comparisons are significantly different			
PC	C	A	M
1.43_{a}	4.65_{a}	4.66_{a}	3.11_{a}
2.02_{b}	4.17_{b}	4.11_{b}	$3.42_{a,c}$
1.84_{b}	3.81_{c}	4.10_{b}	2.22_{b}
3.42_{c}	4.23_{b}	4.56_{a}	3.67_{c}
1.44_{a}	4.81_{a}	4.91_{c}	4.16_{d}
6 Cluster Solution 46/60 or 77% of comparisons are significantly different			
PC	C	A	M
1.43_{a}	$4.65_{a,d}$	4.66_{a}	3.11_{a}
1.99_{b}	$4.45_{a,c}$	4.24_{b}	$3.61_{b,d}$
2.04_{b}	3.97_{b}	4.01_{c}	$3.28_{a,b}$

1.84_{b}	3.81_{b}	$4.10_{b,c}$	2.22_{c}
3.42_{c}	4.23_{c}	4.56_{a}	3.67_{d}
1.44_{a}	4.81_{d}	4.91_{d}	4.16_{e}

Note: PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance. Means in the same column that do not share subscripts differ at $p < .05$ in the Tukey HSD comparison.

The next phase in determining the most appropriate number of clusters was to examine the number of individuals in each cluster for every solution. In the three cluster solution there were clusters of 59, 56, and 14 individuals. In the four cluster solution there were clusters of 43, 16, 56, and 14 individuals. In the five cluster solution there were clusters of 43, 16, 50, 6, and 14 individuals. For the six cluster solution, there were clusters of 43, 16, 21, 29, 6, and 14 individuals.

It was decided that the five cluster solution was the best choice. It had the largest percentage change in clustering coefficients (6.5%) in comparison to other solutions and tied for the greatest percentage of significant post-hoc comparisons (83%) with the three cluster solution. The one weakness of the five cluster solution is the existence of one cluster that only captures 5% of the sample.

Overall, cluster analysis was completed successfully for the post-treatment URICA data. The hypothesis was supported.

Section V: Ranking the Post-treatment Cluster Profiles

Hypothesis: The cluster profiles will be similar to those found in previous research and can be "ranked" in terms of least to most ready to change.

Step five involved an interpretation of the five cluster solution. The standardized *T* scores for each stage and percentage of individuals placed into each cluster are presented in Table 19.

Table 19

Standardized Stage Scores Post-treatment

Cluster Profile	PC *T* score	C *T* score	A *T* score	M *T* score	*n*	% of total sample
Immotive	53.8	45.1	42.1	52.1	50	39%
Reluctant/Discouraged	50.7	36.3	41.9	32.1	14	11%
Ambivalent	78.1	46.5	53.9	56.3	6	5%
Decision-making	43.6	56.6	56.4	47.0	43	33%
Participation	43.7	60.6	62.8	64.5	16	12%

The cluster profiles are presented in Figures 6 to 10 from least advanced to most advanced. The profile in Figure 6 was labelled "immotive" due to its similarity in shape and elevation to the profile labelled "immotive" by McConnaughy et al. (1983, 1989). It was very similar to the "immotive" pre-treatment profile from the current study.

The immotive profile appeared to be the least advanced due to its below average scores on Contemplation and Action, and its above average scores on Precontemplation and Maintenance. It appeared that individuals in this profile were maintaining a pattern of not acknowledging the presence of their problems, and were neither thinking nor acting in a way to produce prosocial change. This profile could correspond to being in the very early portion of the Precontemplation stage.

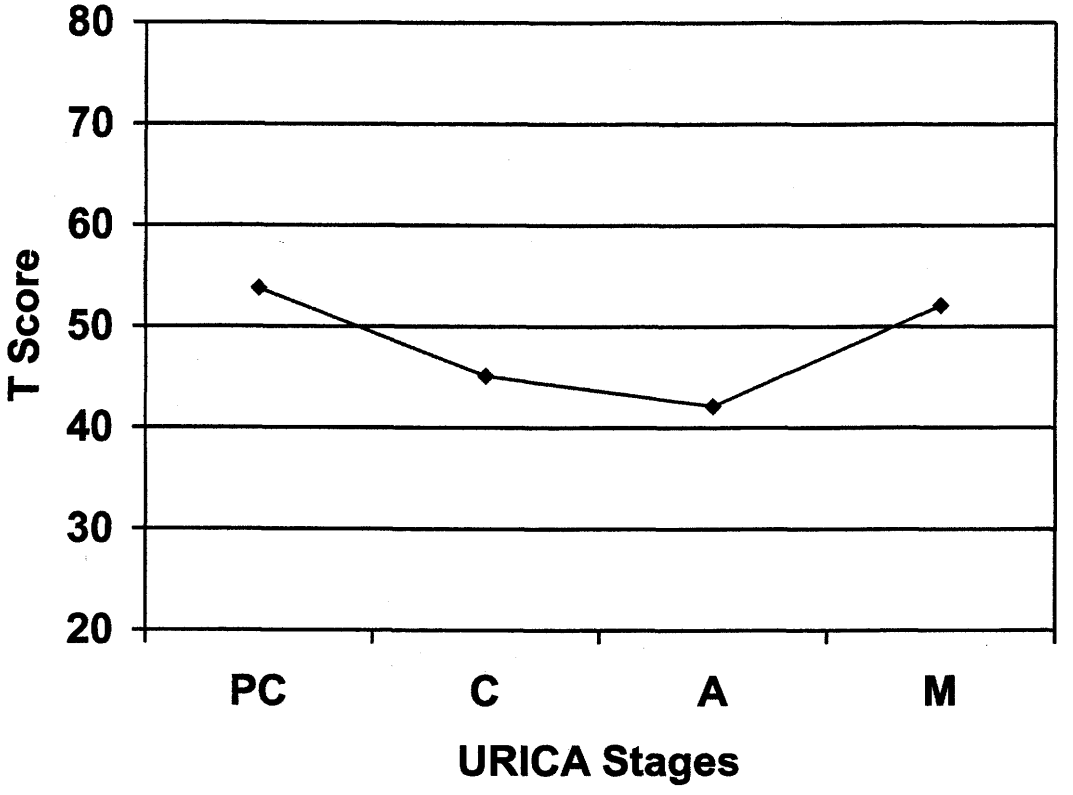

Figure 6. Immotive profile post-treatment.

The next profile (see Figure 7) was labelled "reluctant/discouraged" due to its similarity in shape and elevation to the profile labelled "reluctance" by McConnaughy et al. (1983), "discouraged" by McConnaughy et al. (1989), "uninvolved/discouraged" by DiClemente and Hughes (1990), and "reluctant" by Levesque et al. (2000).

The Precontemplation stage was above average and the other three stages were below average. While these individuals were not thinking about change currently, they may have been less likely to maintain a negative lifestyle than individuals in the "immotive" profile if they were approached in the proper manner. The reluctant/discouraged profile could correspond to being in the middle portion of the Precontemplation stage.

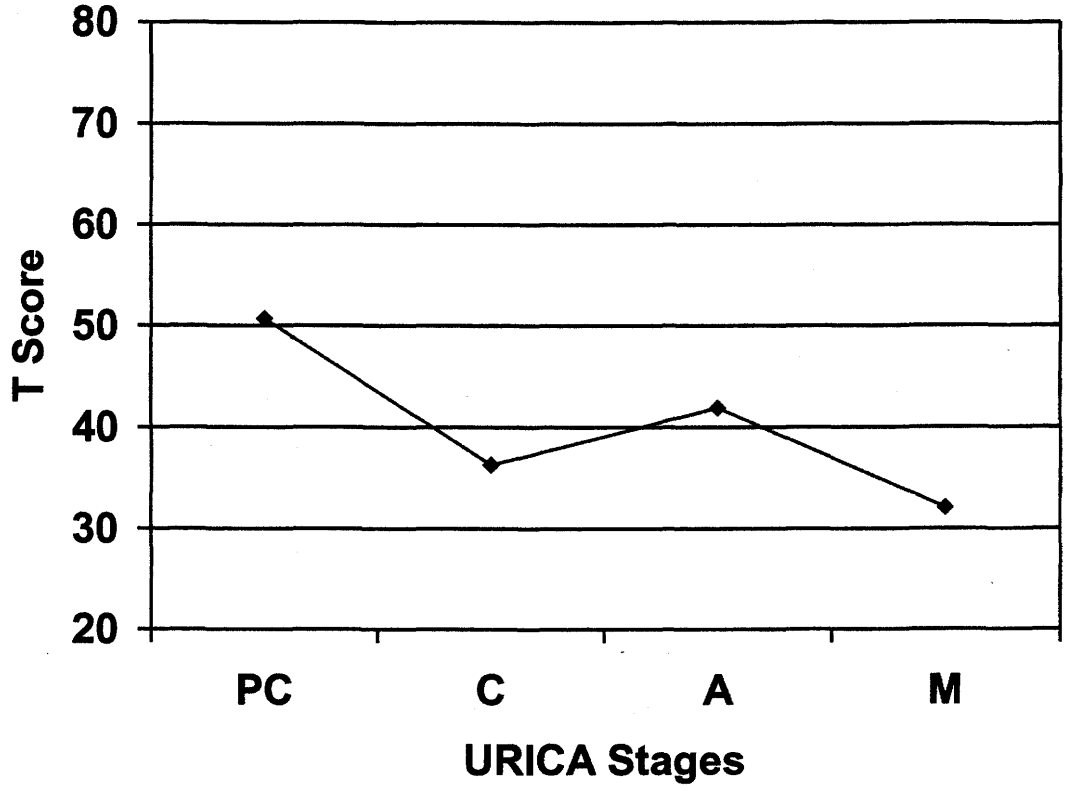

Figure 7. Reluctant/Discouraged profile post-treatment.

The profile in Figure 8 was labelled "ambivalent" due to its similarity in shape and elevation to the profile labelled "nonreflective action" by McConnaughy et al. (1983), "ambivalent" by Carney and Kivlahan (1995), and "ambivalent" by DiClemente and Hughes (1990). With only six individuals, this was the smallest cluster profile generated in this study.

The ambivalent profile was characterized by a well above average Precontemplation stage score, with the other three stage scores being in the average to above average range. This could be interpreted as meaning that these individuals were "of two minds" about their negative lifestyle. While they were not actively endorsing the existence of problems, they were thinking (and perhaps) acting in a prosocial manner.

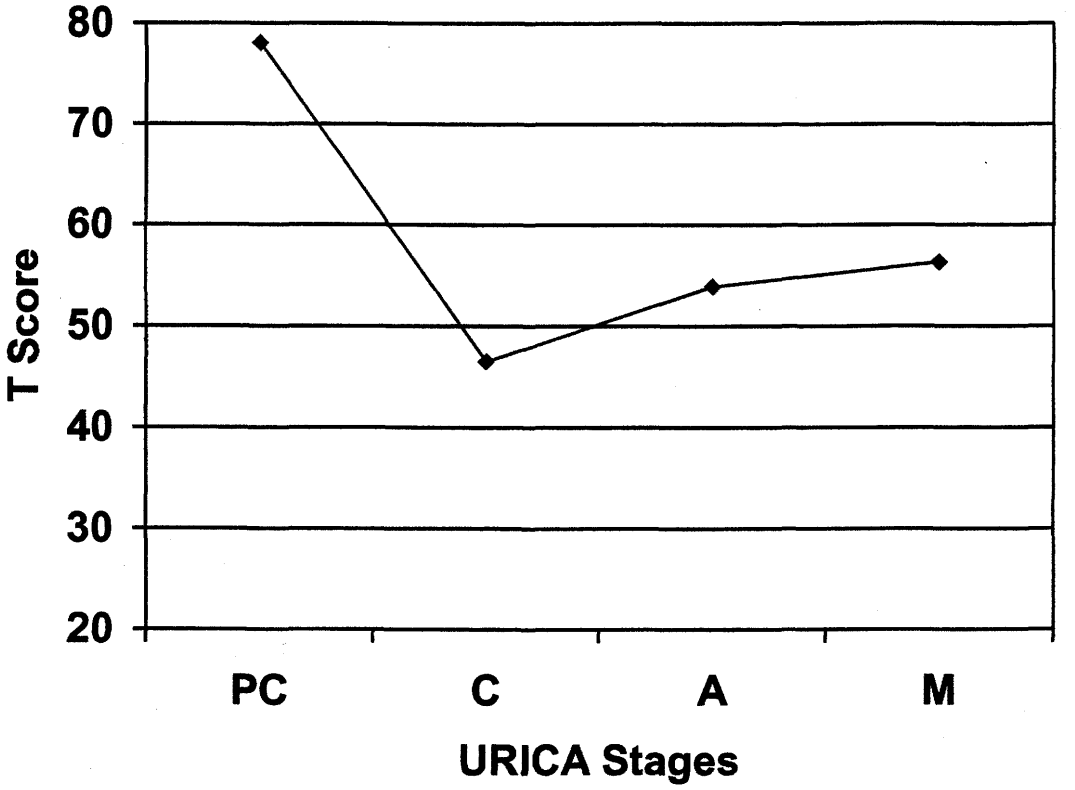

Figure 8. Ambivalent profile post-treatment.

The profile in Figure 9 was labelled "decision-making" as it was most similar in shape and elevation to the profile labelled "decision-making" by McConnaughy et al. (1983, 1989). It was also very similar to the pre-treatment "decision-making" profile from the current study.

The highest stage scores were Contemplation and Action, with the Precontemplation stage being below average and the Maintenance stage approximately average. This could be interpreted as meaning that individuals within this profile were seriously considering making prosocial changes in their lives but had not done so. The decision-making profile could correspond to being in the later portion of the Contemplation stage or the early portion of the Preparation stage.

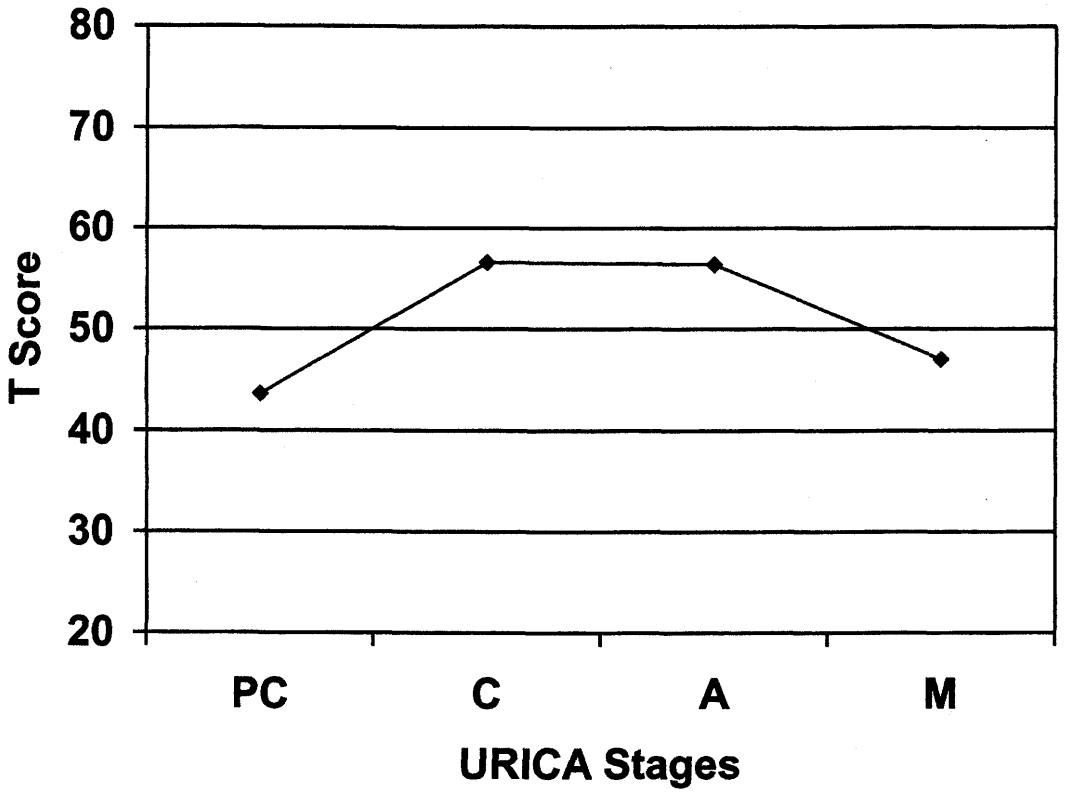

Figure 9. Decision-making profile post-treatment.

The profile in Figure 10 was labelled "participation" due to its similarity in shape and elevation to the profile labelled "participation" by Carney and Kivlahan (1995), DiClemente and Hughes (1990), Levesque et al. (2000), McConnaughy et al. (1983, 1989). It was also very similar to the pre-treatment "participation" profile from the current study.

This was the most advanced profile as the Precontemplation stage was below average and the Contemplation, Action, and Maintenance stages were well above average. Individuals in this profile were likely making and maintaining some type of changes to their lifestyles. The participation profile could correspond to being firmly in the Action stage of change.

Overall, the profiles generated from the post-treatment URICA scores were similar to those found in previous research and could be rank-ordered. Thus, this hypothesis was supported.

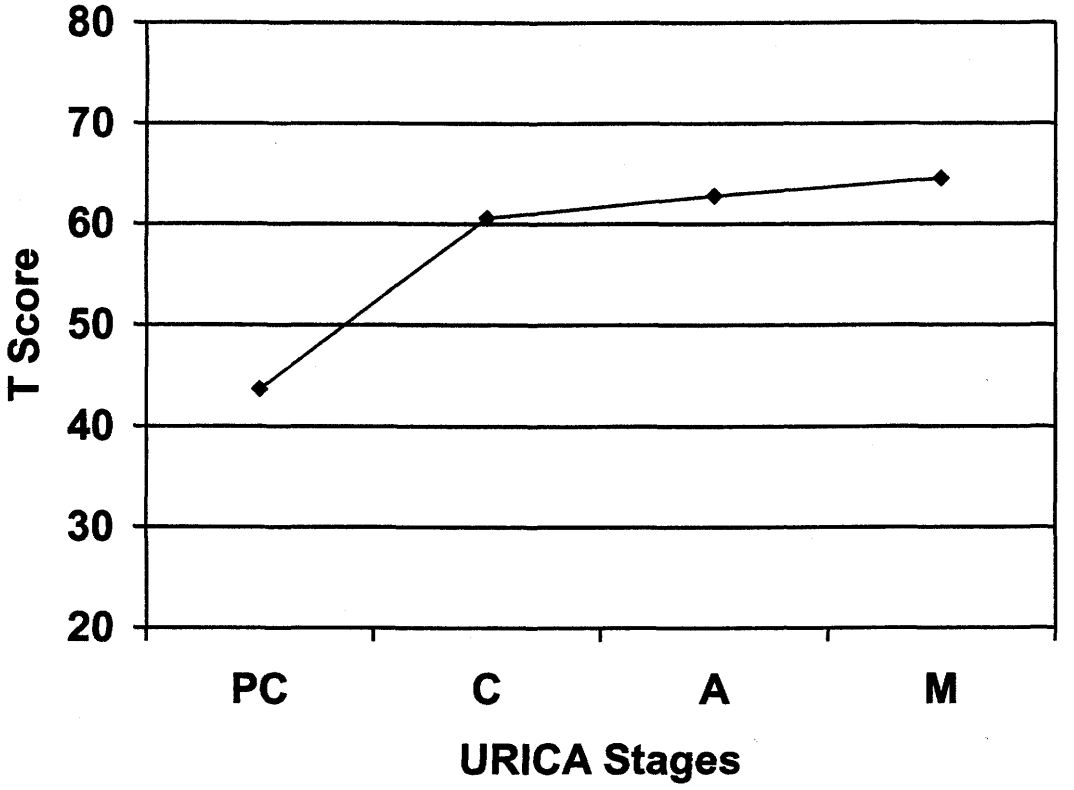

Figure 10. Participation profile post-treatment.

Section VI: Progression, Regression, and No Movement

Progression through readiness for change from pre- to post-treatment was tracked by constructing a "movement matrix." For the matrix, the pre- and post-treatment URICA cluster profiles of the 123 individuals who completed the URICA at both pre- and post-treatment were compared to see if individuals' profiles progressed, regressed, or stayed the same between pre- and post-treatment assessment (see Table 20).

Table 20

Pre-treatment Cluster Profiles to Post-treatment Cluster Profiles

Post Pre	IM	RD	AM	DM	P
IM	21	**2**	**1**	**6**	**2**
PC	11	6	**3**	**8**	**1**
DM	6	6	1	13	**2**
PP	6	0	1	8	**2**
P	3	0	0	6	8

Note: IM = Immotive, PC = Precontemplative, DM = Decision-making, PP = pre-participation, P = Participation, RD = Reluctant/Discouraged, AM = Ambivalent. Numbers represent number of individuals. Underlined numbers indicates no change. Bolded numbers indicate progression through the profiles. Standard presentation numbers indicate a regression through the profiles.

As seen in Table 20, 27 (22%) individuals progressed through the profiles, 48 (39%) stayed at the same or similar profile, and 48 (39%) regressed through the profiles. Of the individuals who began treatment in less advanced profiles (Immotive and Precontemplative), 23 (38%) progressed, 27 (44%) stayed the same, and 11 (18%) regressed through the cluster profiles. Of the individuals who began treatment in more

advanced profiles (Decision-making, Preparticipation, and Participation), four (6%) progressed, 21 (34%) stayed the same, and 37 (60%) regressed through the cluster profiles.

Unexpectedly, nine people moved from being in the least advanced cluster profile at pre-treatment to the most advanced cluster profile at post-treatment, and nine people moved from being in the most advanced cluster profile at pre-treatment to the least advanced cluster profile at post-treatment. It was hypothesized that if these extreme progressions and regressions were representative of true change for the 18 individuals, then these individuals would also score differently on the other variables of interest in this study. Post hoc *t* test and chi-square analyses were conducted to test this hypothesis (see Appendix D for details). The "extreme" progressors and "extreme" regressors were placed into separate groups and compared to the remaining sample on age, length of sentence, education, intelligence score, pre- and post-treatment CSS-M, RPI, STAXI, PDS, VRS, SRS, PCL-R, and amount of institutional misconduct. Only one significant difference was found; the "extreme" regressors scored significantly higher than the rest of the group on the post-treatment Anger-in subscale of the STAXI (t [123] = -2.38, p = .019). Chi-square analyses identified no significant relationships between the "extreme" progressors, "extreme" regressors, and other individuals with discharge reason, marital status, ethnicity, and occupation. These results indicated that the post hoc hypothesis was not supported; the "extreme" movers did not score differently on most variables of interest in this study.

Given that the "extreme" regressors are more clinically puzzling, further post hoc exploration focused on whether these individuals were different from other individuals

who were also in the least advanced cluster profile at post-treatment. It was hypothesized that the nine "extreme" regressors would be different from other individuals in the Immotive cluster profile at post-treatment. Post hoc two-tailed t tests were used to test this hypothesis comparing the two groups on their standardized URICA stage scores. The "extreme" regressors were found to have significantly lower Precontemplation T scores (t [48] = -2.20, p = .033), significantly higher Contemplation scores (t [48] = 2.93, p = .005), and higher Action and Maintenance scores. The distribution of the "extreme" regressors' scores supported the hypothesis that they were somewhat different from the other individuals in the Immotive cluster profile. In fact, they appeared to be a more thoughtful, action oriented group that was more likely to acknowledge problems and maintain their current functioning. However, they still remained more similar to individuals in the Immotive profile than individuals in the other cluster profiles.

Section VII: Cluster Profiles, Demographics, and Socially Desirable Responding

Hypothesis: The cluster profiles will be independent of sample demographics; however, Self Deceptive Enhancement scores will correlate negatively with cluster profile rankings.

Two-tailed correlational analyses were used to look at the relationship between the cluster profile rankings and the current sample's mean age and education. Cluster profile rankings were not correlated significantly with age or education at pre- and post-treatment (age: pre-treatment r_s = .11, p = .119, n = 192; post-treatment r_s = .10, p = .263, n = 129; education: pre-treatment r_s = .09, p = .248, n = 177; post-treatment r_s = .03, p = .719, n = 120).

Using chi-square analyses no significant pre-treatment relationships were found between cluster profiles and marital status (χ^2 [4, n = 190] = .89, p = .925) or occupation (χ^2 [12, n = 165] = 11.66, p = .473). However, a significant result was found with ethnic background (χ^2 [8, n = 129] = 22.84, p = .004).

There were no significant post-treatment relationships between cluster profiles and marital status (χ^2 [4, n = 128] = 1.91, p = .752), occupation (χ^2 [12, n = 110] = 14.63, p = .262), or ethnic background (χ^2 [8, n = 129] =14.12, p = .079). Although more Aboriginal offenders than Caucasian offenders began treatment in less advanced cluster profiles the statistical relationship disappeared by the end of treatment (see Table 21).

Table 21

Cluster Profile with Ethnic Background

Pre-treatment Cluster Profiles						
	IM	PC	DM	PP	P	*n*
Caucasian	15 (18%)	18 (22%)	22 (27%)	10 (12%)	17 (21%)	82
Aboriginal	35 (35%)	28 (28%)	15 (15%)	17 (17%)	6 (6%)	101
Other	1 (13%)	4 (50%)	3 (38%)	0 (0%)	0 (0%)	8
Post-treatment Cluster Profiles						
	IM	RD	AM	DM	P	*n*
Caucasian	23 (37%)	5 (8%)	0 (0%)	23 (37%)	12 (19%)	63
Aboriginal	26 (43%)	8 (13%)	5 (8%)	18 (30%)	4 (7%)	61
Other	1 (20%)	1 (20%)	1 (20%)	2 (40%)	0 (0%)	5

Note: IM = Immotive, PC = Precontemplative, DM = Decision-making, PP = Pre-participation, P = Participation, RD = Reluctant/Discouraged, AM = Ambivalent.

The scores for the PDS at pre- and post-treatment are listed in Table 22. One-tailed correlational analyses were used to investigate the relationship between Self-

deceptive Enhancement (SDE) and Impression Management (IM) with the URICA cluster profile rankings. SDE did not correlate significantly in a negative direction with either pre-treatment cluster profile rankings (r_s = .07, p = .200, n = 150) or post-treatment cluster profile rankings (r_s = .13, p = .102, n = 100). IM scores did not correlate significantly with either pre-treatment cluster profile rankings (r_s = .10, p = .106, n = 150) or post-treatment cluster profile rankings (r_s = .00, p = .484, n = 100). Therefore, cluster profile rankings were independent of socially desirable responding.

Table 22

PDS Scores

	Pre-treatment	Post-treatment	Change Score
SDE	4.74	5.15	-.41
IM	5.21	4.45	.76

In comparison with the norms provided by Paulhus (1998) for 603 prisoners, the pre-treatment sample's mean score for SDE was at the 59th percentile and the mean IM score was at the 50th percentile. At post-treatment, the means scores were at the 61st and 47th percentile, respectively. This is further evidence that the individuals in this sample were not engaging in clinically significant amounts of socially desirable responding.

The hypothesis was partially supported. Cluster profiles were not dependent on demographics of the sample, and they were not related to socially desirable responding. The cluster profiles were considered valid and appropriate for further statistical analyses.

Part 2: Indicators of Change During Treatment

Summary: In Part 2, scores on the self-report measures and risk assessment measures were compared at pre- and post-treatment to determine whether change

occurred in the context of treatment attendance. At the end of treatment individuals were experiencing less problems with anger and antisocial attitudes, and had greater understanding of relapse prevention concepts. In addition, individuals' estimated risk decreased from pre- to post-treatment, suggesting that the ABC treatment program was effective at helping individuals manage their risk factors. Staff ratings of individuals' behaviour throughout the 21 weeks of treatment were reviewed. A trend was found for behaviour to improve as individuals progressed through the treatment program. Since the treatment-related measures tapped change over time, this set the stage for examining the relationships between the cluster profile rankings and these measures.

Section I: Changes in Self-Report Measures from Pre- to Post-Treatment

There were positive changes for each STAXI subscale (see Table 23). The significance of change scores was tested using paired-sample *t* tests. This can be interpreted as meaning individuals were reporting decreased subjective experiences of anger with an increased subjective sense of control over their angry feelings.

In comparison with published STAXI subscale norms for adult male inmates (Spielberger, 1991), the overall sample's mean scores at pre- and post-treatment were similar; none were clinically significantly different (more than +/- two SD) from the norms.

Table 23

STAXI Scores

	Pre-treatment	Post-treatment	Change Score	*t* score	*n*
State Anger	11.96	10.74	1.22	$t(127) = 3.57$****	128
Trait Anger	18.45	15.54	2.91	$t(127) = 5.55$****	128
Anger-in	15.92	13.70	2.22	$t(127) = 5.24$****	128
Anger-out	15.66	15.21	.45	$t(127) = 1.23$	128
Anger Control	22.27	25.05	2.78	$t(127) = -5.21$****	128

**** $p < .001$.

The average RPI pre-treatment score was 52.23 ($n = 99$). At post-treatment it was 59.41 ($n = 99$), which translated into an average improvement of 7.18 points. This difference was significant (t [98] = -10.70, $p = .000$).

As shown in Table 24, there were positive changes on the CSS-M mean scores from pre- to post-treatment. The significance of change scores was tested using paired-sample t tests. Only the Police subscale did not show statistically significant change.

Table 24

CSS-M Scores

	Pre-treatment	Post-treatment	Change Score	*t* Score	*n*
Total	28.77	22.23	6.54	$t(129) = 6.16$****	130
Law	4.80	3.72	1.08	$t(129) = 4.03$****	130
Court	7.22	5.40	1.82	$t(129) = 5.72$****	130
Police	5.68	5.57	.11	$t(129) = .38$	130
TLV	6.62	4.02	2.60	$t(129) = 6.26$****	130
ICO	4.45	3.52	.92	$t(129) = 4.38$****	130

**** $p < .001$.

In order to determine is there were any relationships between the PDS and the other self-report measures, two-tailed correlational analyses were conducted (see Appendix E for details). There were no significant relationships between the PDS subscales and the RPI at either pre- or post-treatment. Given that the RPI is a test of factual knowledge related to relapse prevention, it should not be affected by presentational bias or self-perception (i.e., individuals either know the information or they do not). However, a pattern emerged for the CSS-M and STAXI wherein there were more significant negative correlations with the IM subscale at pre-treatment but with the SDE subscale at post-treatment (see Appendix E). This pattern suggested that at pre-treatment individuals' identification of their anger problems and antisocial attitudes varied inversely with their wilful deception of others. At post-treatment, individuals' acknowledgement of anger problems and antisocial thinking varied inversely with degree of self-deception. It appeared that individuals experienced problems with anger and antisocial attitudes both before and after treatment but differed in how they handled it. At pre-treatment there were attempts to present a socially conventional front and deceive others (e.g., treatment staff), while at post-treatment they were engaging in self-deception (e.g., "everything is okay now because I've taken a treatment program"). This pattern of impression management at pre-treatment and self-deception at post-treatment is a common finding in forensic research (personal communication, D. Simourd, March 12 2004). However, as mentioned earlier, the sample's scores on the PDS did not differ substantially from the normative correctional sample. Thus, although there were significant correlations between the PDS and other self-report measures, this should not be interpreted as meaning that responses on the self-report measures were invalid.

Section II: Changes in Risk from Pre- to Post-Treatment

There were reductions in mean scores on the SRS (pre-treatment = 22.15, post-treatment = 20.47, change = 1.69, n = 104). The change score was tested using a paired-sample t test and was significant (t [103] = 4.08, p = .000).

There were reductions in mean scores on the VRS (see Table 25). The significance of change scores was tested using paired-sample t tests. The lack of change in the VRS static factors was expected, as these factors are historical and not amenable to treatment efforts. These reductions suggest that treatment attendance was successful at helping individuals manage their dynamic risk factors.

Table 25

VRS Scores

	Pre-treatment	Post-treatment	Change Score	t Score	n
VRS Total	58.87	54.13	4.74	t (197) = 22.22****	198
Static	13.42	13.36	.06	t (197) = 1.90	198
Dynamic	45.45	40.77	4.68	t (197) = 17.71****	198

**** $p < .001$.

Section III: Changes in the Group Behaviour Checklist Scores

Hypothesis: As time in treatment progresses, weekly averaged GBC scores will increase.

A linear regression was computed for the GBC ratings over the 21 weeks of treatment. A correlation of .73 was found between GBC score and week in treatment, with an R^2 of .527 suggesting that 52.7% of the variance in GBC scores was explained by time in treatment. This indicates that as time in treatment progressed, overall weekly GBC averages increased.

When the GBC weekly averages are graphed, there is a clear positive slope from the beginning of treatment to the end of treatment, with a sharp "spike" at week 15 (see Figure 11).

Given the spike at week 15, a second linear regression was computed up to and including week 15. A correlation of .83 was found between GBC score and week in treatment, with an R^2 of .688 suggesting that 68.8% of the variance in GBC scores was explained by time in treatment. This indicated that individuals' GBC scores decreased during the last six weeks of treatment and these lower scores reduced the overall relationship between GBC and week in treatment.

The hypothesis was supported; overall there was a linear relationship between GBC scores and week of treatment, and this supported using GBC scores as an indicator of change due to treatment.

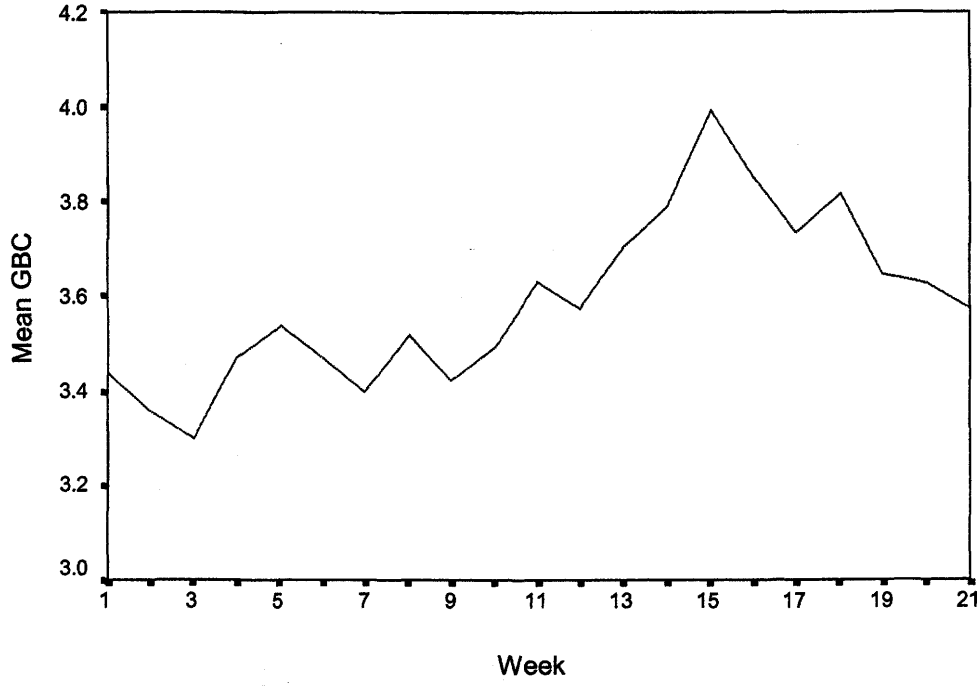

Figure 11. Weekly GBC averages.

Part 3: Relationships Between Cluster Profile Rankings and Self- and Staff-report Treatment Process Variables, Risk Variables, and Outcome Variables

Summary: In Part 3, the relationships between the cluster profile rankings and other forensic variables were explored. Pre-treatment cluster profile rankings were correlated with pre-treatment self-report measures, and post-treatment cluster profile rankings were correlated with post-treatment self-report measures. The results indicated that being in more advanced profiles was associated with less difficulties with anger and antisocial attitudes at post-treatment. While knowledge of relapse prevention concepts was related slightly to the cluster profile rankings at pre-treatment, this relationship was less at post-treatment, suggesting that individuals from all levels of readiness for change had learned the material by the end of treatment. GBC scores were related to cluster profiles; individuals in less advanced profiles were found to "peak" on their GBC scores at week 15 of treatment while individuals in the more advanced profiles continued to improve throughout the entire 21 weeks of treatment. The cluster profile rankings were not correlated with VRS, PCL-R, or SRS scores and there was minimal relationship with institutional misconduct or recidivism (although most correlations were in the expected directions).

Section I: Cluster Profiles and Self-Report Measures

Hypothesis: Subscale scores from the STAXI will correlate positively with the cluster profile rankings at pre- and post-treatment.

Based upon reviews of clinical notes within institutional files, every individual in the study was identified as having an anger management problem. One-tailed correlational analyses were used to explore the relationship between the cluster profile

rankings and the STAXI (see Table 26). At pre-treatment one significant correlation was identified. The remaining correlations were very small, although most were in the expected positive direction. These results can be interpreted to mean that being in more advanced profiles was associated with keeping angry feelings bottled up. At post-treatment the correlations were in the negative direction, suggesting that being in more advanced profiles was associated with expressing less angry feelings and less "bottling up" of anger through better management of angry feelings. The change in the direction of the correlations from pre- to post-treatment makes clinical sense since individuals should develop more prosocial ways to interact with others over the course of treatment. Overall, this hypothesis was partially supported.

Table 26

STAXI and Cluster Profiles

	Pre-treatment Profiles (n = 190)	Post-treatment Profiles (n = 129)
State Anger	-.10	-.11
Trait Anger	.07	-.06
Anger-in	.11*	-.26****
Anger-out	.04	-.04
Anger Control	.04	.20**

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

Hypothesis: RPI scores will correlate positively with the cluster profile rankings at pre- and post-treatment (after controlling for the effects of IQ).

One-tailed correlational analyses were used to explore the relationship between the cluster profile rankings and the RPI. After controlling for IQ, a nonsignificant positive relationship was found between URICA profiles and RPI scores at pre-treatment

(r_s = .12, p = .088, n = 137). At post-treatment a nonsignificant negative correlation was found (r_s = -.04, p = .341, n = 91). As a result, this hypothesis was not supported.

Hypothesis: Scores from the CSS-M will correlate negatively with the cluster profile rankings at pre- and post-treatment.

One-tailed correlational analyses found a number of significant negative correlations between cluster profile rankings and CSS-M at both pre- and post-treatment (see Table 27). The only subscale that did not reach statistical significance was the Law subscale, although its correlations were in the expected direction. As a result, being in more advanced profiles was associated with having fewer criminal attitudes. This hypothesis was supported.

Table 27

CSS-M and Cluster Profiles

	Pre-treatment Cluster Profiles (n = 192)	Post-treatment Cluster Profiles (n = 129)
CSS-M Total	-.21***	-.23***
Law	-.11	-.13
Court	-.15*	-.22**
Police	-.15*	-.22**
TLV	-.24****	-.22**
ICO	-.20***	-.14*

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

Hypothesis: Individuals' reason for discharge from treatment will be related to pre- and post-treatment cluster profiles.

Chi-square analyses were used to explore the relationship between cluster profiles and individuals' reason for leaving the treatment program. There were no significant pre-

or post-treatment relationships between cluster profiles and discharge reason (χ^2 [12, n = 190] = 14.45, p = .273 and χ^2 [4, n = 127] = 2.04, p = .728 respectively). Therefore individuals' reasons for discharge were not related to their cluster profile membership, and this hypothesis was not supported.

Section II: Cluster Profiles and the Group Behaviour Checklist

Hypothesis: More advanced cluster profiles will be associated with greater GBC scores throughout treatment than less advanced cluster profiles.

A linear regression was computed in order to determine whether individuals from more advanced profiles received higher GBC scores over weeks in treatment. Individuals were grouped into "more advanced" or "less advanced" profile groups at pre- and post-treatment. The pre-treatment Decision-making, Preparticipation, and Participation cluster profiles were grouped together as more advanced, while Immotive and Precontemplative cluster profiles were grouped together as less advanced. The post-treatment Decision-making and Participation cluster profiles were grouped together as more advanced, while Immotive, Reluctant/Discouraged, and Ambivalent cluster profiles were grouped together as less advanced. A cluster's placement into more advanced or less advanced was based on an understanding of each cluster's relationship to the stages of change and descriptions of the clusters from previous research. Given the "spike" in GBC scores at week 15 (see Figure 11), linear regressions were computed for 21 weeks of treatment and 15 weeks of treatment using the more and less advanced groups for both pre- and post-treatment cluster profiles. As can be seen in Table 28, the strength of the regression increased noticeably for individuals in the less advanced cluster profiles when only the first 15 weeks of treatment were included in the analyses. It appeared that individuals in more

advanced profiles continued to improve throughout the entire 21 weeks of treatment while individuals in the less advanced profiles stopped improving with six weeks of treatment remaining. Overall, this hypothesis was supported.

Table 28

Linear Regression for More and Less Advanced Cluster Profiles and Week of Treatment

	Pre-treatment More Advanced Clusters		Pre-treatment Less Advanced Clusters		Post-treatment More Advanced Clusters		Post-treatment Less Advanced Clusters	
	21 Weeks	15 Weeks	21 Weeks	15 Weeks	21 Weeks	15 Weeks	21 Weeks	15 Weeks
R	.66	.65	.64	.81	.83	.71	.49	.85
p	.00	.00	.00	.00	.00	.00	.01	.00
R^2	.43	.42	.41	.66	.68	.50	.24	.72
Adjusted R^2	.40	.38	.38	.63	.66	.46	.20	.70

Hypothesis: Individuals from more advanced cluster profiles will be a qualitatively unique group in terms of treatment behaviour (as measured by the GBC).

For more in-depth analyses, individuals were placed into their pre-treatment cluster profiles for the first half of treatment. Treatment week 11 was chosen as the cut-off point as it was approximately halfway through the treatment program. For the second half of treatment, individuals were placed into their post-treatment cluster profiles. The "switch" of cluster profiles was done on the supposition that during the second half of treatment individuals' level of readiness for change would begin to resemble their post-treatment cluster profiles more than their pre-treatment ones. Individuals were also grouped into more advanced and less advanced profile groups as described above.

The figures representing GBC performance during the first half of treatment appeared relatively similar in shape and slope for both the less advanced (see Figure 12) and more advanced individuals (see Figure 13).

However, the figures representing GBC performance during the second half of treatment were quite different; there was a definite peak and subsequent sharp drop-off for the less advanced profiles (figure 14) while there was a relatively steady progression towards ever-higher GBC scores for the more advanced profiles (figure 15).

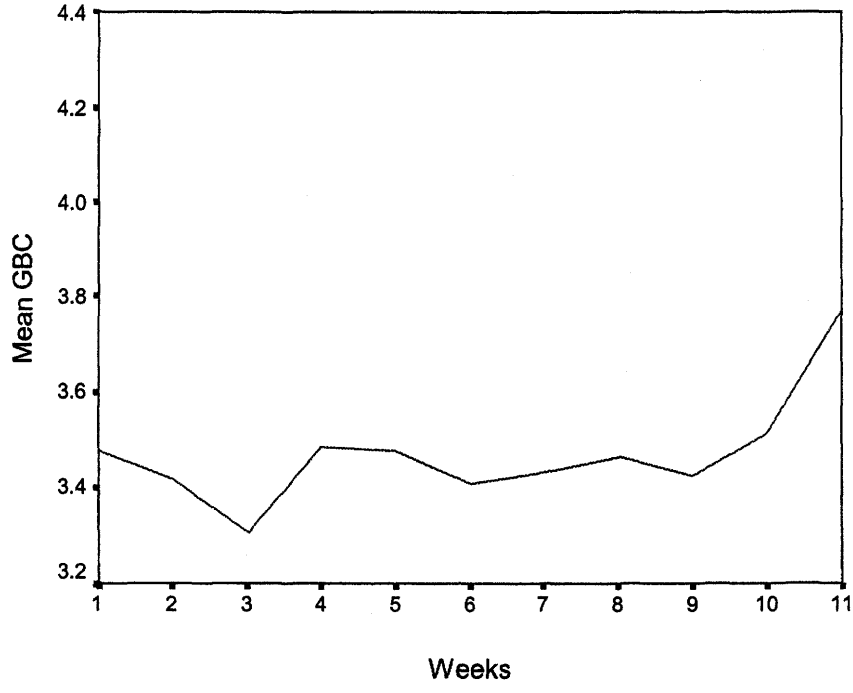

Figure 12. Pre-treatment less advanced profiles over first half of treatment.

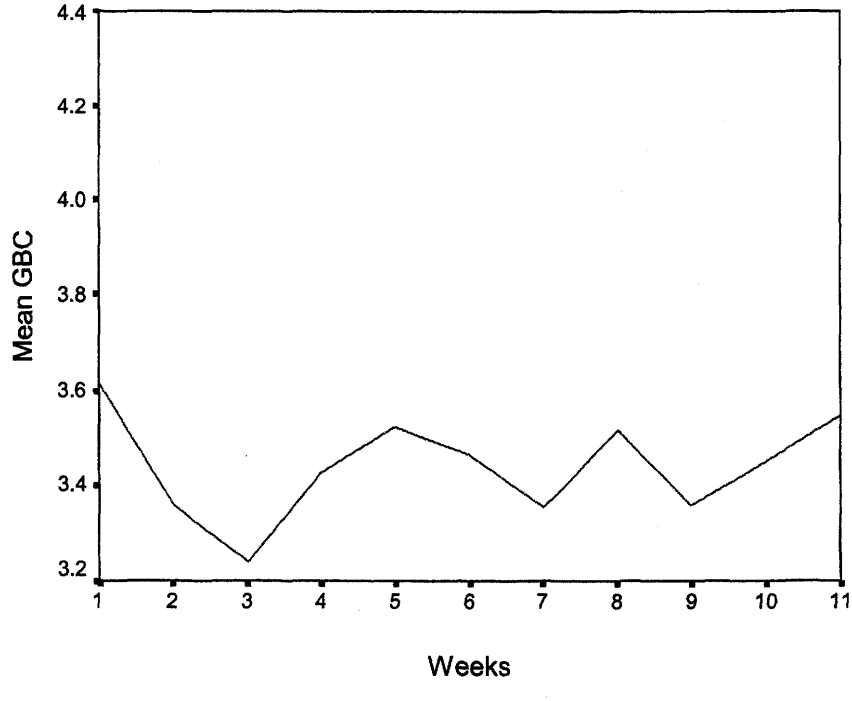

Figure 13. Pre-treatment more advanced profiles over first half of treatment.

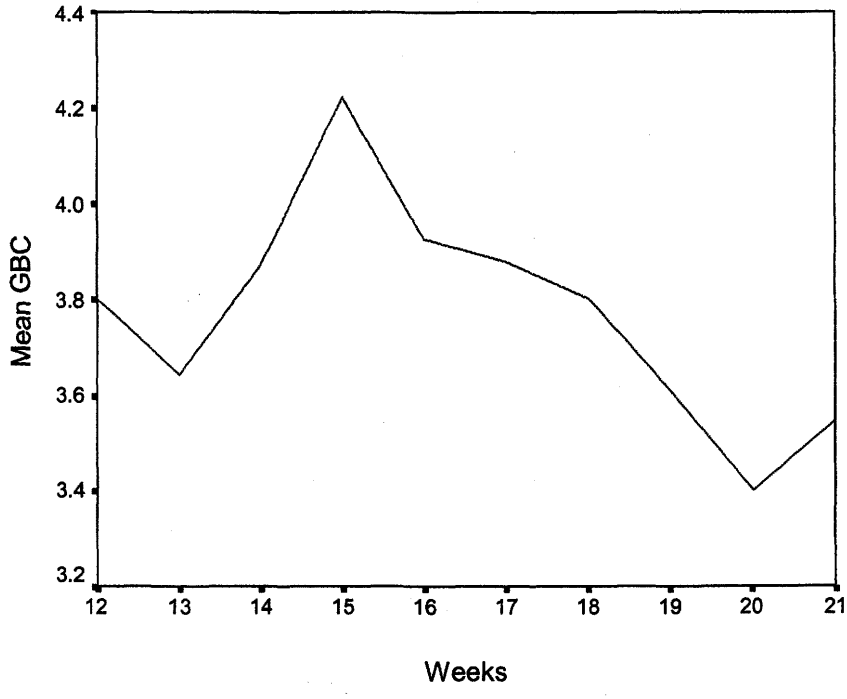

Figure 14. Post-treatment less advanced profiles over second half of treatment.

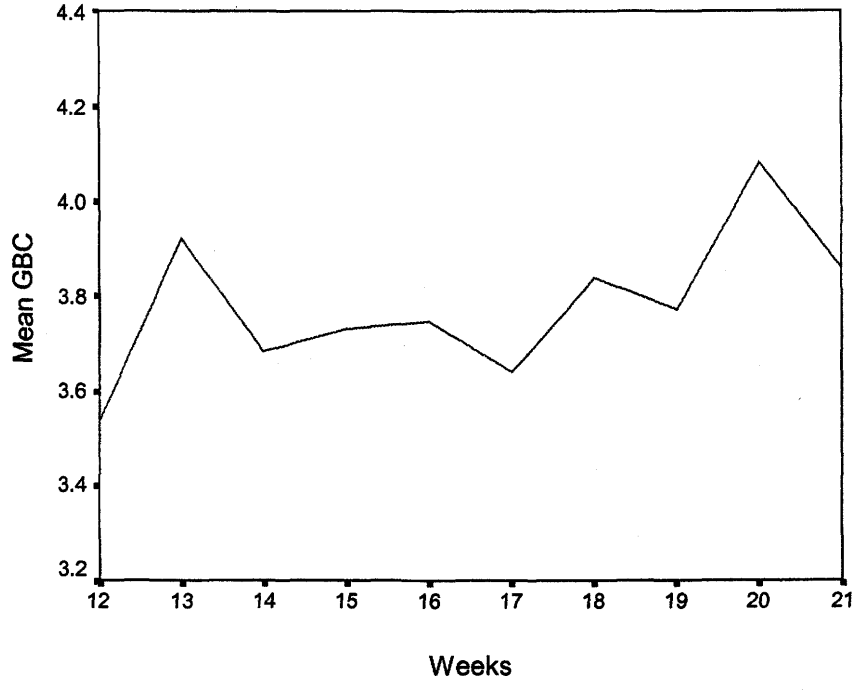

Figure 15. Post-treatment more advanced profiles over second half of treatment.

The difference in GBC scores between individuals in the more and less advanced profiles was only evident during the second half of treatment. This may have been due to the increasing difficulty of the treatment material or the waning interest of individuals who were less ready for change.

Thus, this hypothesis was supported, as individuals in more advanced cluster profiles were qualitatively different during the second half of treatment.

Section III: Cluster Profiles and Measures of Risk

Hypothesis: PCL-R total, Factor 1, and Factor 2 scores will correlate negatively with the cluster profile rankings at pre- and post-treatment.

Using one-tailed correlational analyses, PCL-R total scores, Factor 1 scores, and Factor 2 scores did not correlate significantly in a negative direction with URICA profile cluster rankings at either pre-treatment ($r_s = .06, p = .192, n = 192$; $r_s = .02, p = .372, n = 192$; and $r_s = .06, p = .189, n = 192$ respectively) or post-treatment ($r_s = .04, p = .343, n = 129$; $r_s = -.00, p = .480, n = 129$; and $r_s = .02, p = .402, n = 129$ respectively). Therefore individuals' membership in cluster profiles did not appear to be influenced by their level of psychopathy, and this hypothesis was not supported.

Given that previous researchers (e.g., Hare, 1998; Ogloff, Wong, & Greenwood, 1990) have noted the importance of identifying psychopathy within a treatment sample, further analyses were conducted exploring the relationship of psychopathy with risk level, treatment behaviour, institutional misconduct, and recidivism (see Appendix F for details). Overall, psychopaths demonstrated greater degrees of risk than nonpsychopaths, and psychopaths' risk for violence changed significantly less following treatment. However, no consistent relationship was found between psychopathy and treatment

behaviours as psychopaths did not always receive significantly worse GBC scores than nonpsychopaths during treatment (although their scores were typically lower). This finding could have resulted from a possible insensitivity of the GBC to true differences between the two groups or treatment being equally well-received by psychopaths and nonpsychopaths. This last possibility is an important consideration given the clinical tradition that psychopaths are unresponsive to treatment.

There were significant positive correlations between PCL-R Factor 1 and amount of institutional misconduct (violent and nonviolent), and PCL-R total score was significantly correlated with amount of nonviolent misconduct. There were significant negative correlations between the total PCL-R and Factor 2 scores and time to first nonviolent misconduct, and positive (but not significant) correlations with time to first violent misconduct. These latter nonsignificant positive correlations between PCL-R scores and time to first violent institutional misconduct indicate a trend for psychopaths to be successful in delaying their return to violent criminal behaviour. This may indicate that the ABC treatment program was effective at helping psychopaths to develop some form of impulse control during the remainder of their imprisonment. However, it is important to remember that psychopaths were still engaging in more violent and nonviolent institutional misconduct than nonpsychopaths (although these were not statistically significant differences). The usual trends were found in regard to recidivism after release, with psychopaths committing more crimes and at an earlier time than nonpsychopaths (these differences were not statistically significant). This suggested that treatment gains made by psychopaths "washed out" by the time they were released from prison.

Hypothesis: SRS scores will correlate negatively with the cluster profile rankings at pre- and post-treatment.

One-tailed correlational analyses were used to determine the relationship between cluster profile rankings and the SRS. No significant negative correlations were found at pre-treatment with SRS scores (r_s = -.12, p = .092, n = 124) or SRS security category (r_s = -.04, p = .320, n = 177). Post-treatment cluster profile rankings did not correlate significantly with post-treatment SRS scores (r_s = -.06, p = .267, n = 97) but there was a significant correlation with post-treatment SRS security category (r_s = -.16, p = .048, n = 110). This hypothesis was partially supported.

Hypothesis: VRS scores will correlate negatively with the cluster profile rankings at pre- and post-treatment.

One-tailed correlational analyses were used to determine whether VRS scores decreased as cluster profile rankings increased. Pre-treatment cluster profile rankings did not correlate significantly with pre-treatment VRS static scores (r_s = .05, p = .259, n = 192), dynamic scores (r_s = -.05, p = .264, n = 192), total scores (r_s = -.01, p = .442, n = 192), or the change in total score from pre- to post-treatment (r_s = .08, p = .148, n = 192). Post-treatment cluster profile rankings did not correlate significantly with post-treatment VRS static scores (r_s = -.06, p = .236, n = 129), dynamic scores (r_s = .01, p = .457, n = 129), total scores (r_s = -.05, p = .274, n = 129), or the change in total score from pre- to post-treatment (r_s = .02, p = .398, n = 129). Therefore, individuals' cluster profile rank was independent of risk as measured by the VRS, and this hypothesis was not supported.

Section IV: Cluster Profiles and Criminal Behaviour

This section was meant to be an exploratory investigation of how the cluster profile rankings were related to criminal behaviour. One hundred and ninety-three of the 198 individuals whose files were reviewed for this study returned to a regular Federal institution and were included in the institutional misconduct analyses. These individuals were incarcerated for an average of 18.32 months (range of one to 54 months) post-RPC treatment. Sixty-five percent of the sample received at least one institutional misconduct. One hundred and twelve (58%) individuals in the sample received convictions for nonviolent misconduct and 70 (36%) received charges, but not convictions, for nonviolent misconduct. Twenty individuals (10%) received convictions for violent misconduct and 17 (9%) received charges, but not convictions, for violent misconduct. Given the relatively small base rate of violent misconduct, the number of convictions and charges were combined resulting in 123 (64%) people engaging in nonviolent misconduct and 29 (15%) engaging in violent misconduct.

Of the 198 individuals whose files were reviewed, 93 were released into the community after attending RPC. However, previous RPC-based research was interpreted to mean that a minimum community follow-up period of nine months was needed to get a clear picture of offenders' level of functioning (personal communication, S. Wong, October 13 2003). Fifty individuals from the current study had been released to the community for nine months or longer following treatment at RPC (average follow-up period of 22 months). Thirty-two (64%) individuals received a conviction (11 received violent convictions and 30 received nonviolent convictions) and 15 (30%) individuals received a charge (nine received violent charges and 14 received nonviolent charges).

Given the small amount of data, and resulting lack of power in the analyses, all the variables were collapsed to form one variable representing any type of known criminal behaviour while in the community. As a result, 33 of the possible 50 individuals released to the community for at least nine months were identified as having engaged in criminal behaviour (conviction and/or charge) and therefore included in the recidivism analyses.

Given that there was a short follow-up period and small number of individuals who engaged in the behaviours of interest, the following results should be interpreted with caution. These findings may not be generalisable, and they should be considered as an exploratory look at the relationship between cluster profile rankings and criminal behaviour.

Hypothesis: After controlling for VRS total score, the amount of violent and nonviolent institutional misconduct received post-RPC will correlate negatively with the cluster profile rankings at pre- and post-treatment.

After controlling for VRS total score, one-tailed correlational analyses were used to determine the presence of a negative relationship between the pre- and post-treatment cluster profile rankings and post-RPC institutional misconduct. There was a significant finding for violent institutional misconduct at post-treatment (see Table 29). This makes conceptual sense as the post-treatment cluster profiles were closer in time to the post-RPC time period than the pre-treatment cluster profiles. All correlations were in the expected negative direction. This hypothesis was partially supported.

Table 29

Relationship Between Pre- and Post-treatment Cluster Profiles and Post-RPC Institutional Misconduct

	Pre-treatment Profile	*n*	Post-treatment Profile	*n*
Nonviolent Contact	-.02	184	-.02	121
Violent Contact	-.00	184	-.27****	121

**** $p < .001$.

Hypothesis: After controlling for VRS total score, the time to first institutional misconduct post-RPC will correlate positively with the cluster profile rankings at pre- and post-treatment.

One-tailed correlational analyses were used to determine the relationship between the pre- and post-treatment cluster profile rankings and the time to the first institutional misconduct that occurred after attending RPC. After controlling for VRS total score, there were no significant results (see Table 30). This hypothesis was not supported.

Table 30

Relationship Between Pre- and Post-treatment Cluster Profiles and Number of Months to First Post-RPC Institutional Misconduct

# of Months to:	Pre-treatment Profile	*n*	Post-treatment Profile	*n*
1st Nonviolent Contact	.05	115	-.11	72
1st Violent Contact	-.02	25	--	7

-- = a correlation coefficient could not be computed

Hypothesis: After controlling for VRS total score, the amount of community recidivism will correlate negatively with the cluster profile rankings at pre- and post-treatment.

One-tailed correlational analyses were used to determine the relationship between the pre- and post-treatment cluster profile rankings and criminal offences that occurred after release from prison. Individuals were included in these analyses if they had been released to the community for at least nine months following treatment at RPC. After controlling for VRS total score, no significant relationships were found between pre- and post-treatment cluster profiles and amount of recidivism although the correlations were in the expected negative direction ($r = -.06$, $p = .348$, $n = 46$ and $r = -.01$, $p = .491$, $n = 19$ respectively). This hypothesis was not supported.

Hypothesis: After controlling for VRS total score, the time to first community recidivism will correlate positively with the cluster profile rankings at pre- and post-treatment.

After controlling for VRS Total score, one-tailed correlational analyses were used to determine the relationship between the pre- and post-treatment cluster profile rankings and months to CPIC offences that occurred following release from prison. Individuals were included in these analyses if they had been released to the community for at least nine months and had been either reconvicted or recharged. No significant results were found and the correlations were in the unexpected direction (pre-treatment: $r = -.04$, $p = .419$, $n = 29$; post-treatment: $r = -.14$, $p = .351$, $n = 8$). This hypothesis was not supported.

The only evidence for relationships between cluster profile rankings and institutional misconduct/recidivism was that most correlations (7/11) were in the

expected direction and there was a significant negative correlation between violent institutional misconduct and post-treatment cluster profile rankings.

Given that the VRS total score contains a stages of change component there is a possibility that controlling for risk using the VRS would indirectly also control for readiness to change. As a result, analyses between cluster profile rankings and criminal behaviour (institutional misconduct and community recidivism) were repeated controlling for risk using the PCL-R total score. The correlation coefficients from these analyses were almost identical to those reported above, with only one statistically significant result (post-treatment cluster profile ranking with violent institutional misconduct $r = -.27$, $p = .001$, $n = 121$). As a result, it does not appear that controlling for risk using the VRS total score also controls for level of readiness to change.

Part 4: Comparison of Cluster Profiles and VRS Stages

Summary: Individuals were placed into their stage of change based on their VRS stage ratings. At pre-treatment, most individuals were in the Contemplation stage. Relatively few individuals failed to progress through the stages, resulting in most individuals being in the Preparation stage at post-treatment. Cluster profile rankings correlated significantly with VRS stage membership at pre-treatment but not at post-treatment. When the strength of the correlations between cluster profile rankings and VRS stages with other variables were compared, VRS stages' better performance was limited primarily to stronger relationships with risk assessment measures. The VRS stages did not have stronger correlations with variables related to post-RPC institutional misconduct or community recidivism.

Section I: VRS Stage Membership

Individuals were placed into one of the five stages of change based upon which stage was endorsed most frequently in their VRS stage rating. At pre-treatment, there were 42 (21%) individuals in the Precontemplation stage, 132 (67%) in the Contemplation stage, 22 (11%) in the Preparation stage, and 1 (0.5%) in the Action stage. At post-treatment, 16 (8%) individuals were in the Precontemplation stage, 54 (27%) were in the Contemplation stage, 116 (59%) were in the Preparation stage, and 11 (6%) were in the Action stage. No individuals were in the Maintenance stage at either pre- or post-treatment, and one individual could not be classified due to elevations on multiple stages.

The pre- and post-treatment VRS stages of the 197 individuals for whom the VRS was completed at both pre- and post-treatment were compared to see if individuals' VRS stages progressed, regressed, or stayed the same between pre- and post-treatment assessment. One hundred and thirty (66%) individuals progressed through the stages, 66 (34%) stayed at the same stage, and 1 (0.5%) regressed through the stages.

When individuals had equal scores for two different stages, they were assigned to the less advanced stage. At pre-treatment there were nine ties (seven between Precontemplation and Contemplation, and one each between Contemplation and Preparation and between Preparation and Action). At post-treatment there were 15 ties (two between Precontemplation and Contemplation, 12 between Contemplation and Preparation, and one between Preparation and Action).

Hypothesis: URICA cluster profile rankings will correlate positively with VRS stages at pre- and post-treatment.

The pre-treatment VRS stage correlated significantly (r_s = .19, p = .005, n = 191) with the pre-treatment URICA cluster profile rankings. There was no significant positive correlation between the post-treatment VRS stages and the post-treatment URICA cluster profile rankings (r_s = .03, p = .388, n = 128). This hypothesis was partially supported. Crosstabulation of VRS stages and URICA cluster profile rankings clarified the relationships between these measures at pre- and post-treatment (see Tables 31 and 32).

Table 31

Crosstabulation of VRS stages and Cluster Profiles at Pre-treatment

Stage Cluster	Precontemplation	Contemplation	Preparation	Action	Total
IM	16	31	4	0	51
PC	9	39	3	0	51
DM	9	23	6	1	39
PP	5	21	1	0	27
P	2	14	7	0	23
Total	41	128	21	1	191

Note: IM = Immotive, PC = Precontemplative, DM = Decision-making, PP = Preparticipation, P = Participation.

Table 32

Crosstabulation of VRS stages and Cluster Profiles at Post-treatment

Stage / Cluster	Precontemplation	Contemplation	Preparation	Action	Total
IM	5	9	32	4	50
RD	0	1	12	1	14
AM	0	0	6	0	6
DM	0	8	29	5	42
P	1	5	9	1	16
Total	6	23	88	11	128

Note: IM = Immotive, RD = Reluctant/Discouraged, AM = Ambivalent, DM = Decision-making, P = Participation.

A number of post-hoc steps were taken in order to better understand the unexpected lack of relationship between the cluster profiles and VRS stages at post-treatment. First, it was hypothesized that the lack of relationship at post-treatment may have been due to the earlier finding that nine people moved from being in the most advanced cluster profile at pre-treatment to the least advanced cluster profile at post-treatment (i.e., "extreme" regressors). In order to test this post hoc hypothesis, these nine individuals were removed and the correlational analysis was reconducted. No significant relationship was found between the post-treatment cluster profiles and stages (r_s = -.02, p = .416, n = 119), therefore the hypothesis was not supported.

Second, it was hypothesized that the lack of relationship at post-treatment may have been due to differences between individuals who completed both the pre- and post-treatment URICA questionnaires and those individuals who only completed the questionnaire at pre-treatment. This post hoc hypothesis was testing by selecting only those individuals who completed the URICA at pre- and post-treatment and reconducting the correlational analysis. Once again no relationship was found between the post-treatment cluster profiles and the VRS stages ($r_s = .03, p = .356, n = 122$).

Third, it was possible that the low correlation between the post-treatment URICA cluster profile rankings and the VRS stages was due to the time frame implicit in each measure. Scoring the VRS stages involved assessing change that occurred over the entire treatment period (i.e., over several months). In contrast, the URICA was completed on the basis of how the respondent felt at the time of test administration. As a result, it is possible that URICA responses could be influenced by transient alterations in mood or situation.

One possible way to identify alterations over the course of treatment was to examine the weekly GBC averages that were presented earlier (see Figure 11). There was an unexpected drop off in the scores over the last six weeks of treatment, and subsequent regression analyses determined that this drop-off was limited to individuals in the less advanced cluster profiles. Given that the GBC ratings were completed by staff without knowledge of individuals' cluster profile membership, it suggested that individuals from the less advanced post-treatment cluster profiles presented themselves differently during the last six weeks of treatment. The post-treatment URICA was completed immediately

following this drop-off time period, and therefore may have been a self-reported "snapshot" that reflected the negative experience of the last six weeks of treatment. In contrast, the post-treatment VRS stages may have tapped both the positive and negative changes that occurred over the entire treatment experience.

It was hypothesized that if those individuals who received the lowest GBC scores during the last six weeks of treatment were removed from the correlational analysis, the post-treatment URICA cluster profiles would correlate significantly with the post-treatment VRS stages. In order to test this post hoc hypothesis, the average GBC score over the last six weeks of treatment was identified for the entire sample. Individuals who scored below the median were removed and the correlation between the post-treatment cluster profile rankings and the VRS stages was conducted. A significant positive correlation was found ($r_s = .45, p = .012, n = 25$).

Although these results are exploratory in nature, they can be interpreted as preliminary support for the hypothesis that the different time frames implicit in scoring the URICA and the VRS resulted in the URICA being more likely to fluctuate in response to mood or environment. The two stages of change measures may complement each other as they appear to measure motivation over different time frames.

Section II: Comparing Correlational Strengths

Hypothesis: The VRS stages will have significantly greater correlations with other study variables than the URICA cluster profile rankings.

Correlational and chi-square analyses were conducted with the VRS stages and the PDS, STAXI, RPI, CSS-M, GBC, demographic variables, psychopathy, risk level,

institutional misconduct, and recidivism (see Appendix G for details). The results of the correlational analyses were compared to the equivalent analyses of the URICA cluster profile rankings using Hotelling's T analyses (to test the strength of two dependent correlations) in order to determine which measure was more strongly correlated with self-report measures, risk measures, and recidivism. Hotelling's T analyses were conducted only when the VRS stages or the URICA cluster profile rankings (or both) were correlated significantly with the variable of interest. In order to conduct the analyses, there needed to be an equal number of individuals with both a VRS stage and a URICA profile. This involved dropping some individuals who had a VRS. As a result, many of the correlations below are different than those reported earlier in the text due to being based on different numbers of individuals. Tables 33 and 34 show the significant Hotelling's T comparisons for pre- and post-treatment comparisons (see Appendix G for the nonsignificant comparisons).

Table 33

Significant Comparison of Pre-treatment Cluster Profiles and Pre-treatment VRS Stages on Pre-treatment Variables

	Cluster	VRS	*n*	Hotelling's T
Anger-in	.12	-.16	189	3.00***
PCL-R Total	.07	-.34	191	4.71****
PCL-R Factor 1	.03	-.27	191	3.36****
PCL-R Factor 2	.07	-.27	191	3.85****
VRS Total	-.01	-.32	191	3.56****
VRS Static	.05	-.16	191	2.26*
VRS Dynamic	-.04	-.26	191	2.42**

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

Table 34

Significant Comparison of Post-treatment Cluster Profiles and Post-treatment VRS Stages on Post-treatment Variables

	URICA	VRS	URICA/VRS	*n*	Hotelling's T
RPI	-.06	.23	.05	87	-1.93*
PCL-R Total	.05	-.43	.03	128	4.16****
PCL-R Factor 1	.00	-.33	.03	128	2.81***
PCL-R Factor 2	.03	-.41	.03	128	3.81****
VRS Total	-.05	-.49	.03	128	3.95****
VRS Static	-.06	-.29	.03	128	1.89*
VRS Dynamic	.02	-.48	.03	128	4.45****

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

As can be seen in Tables 34 and 35, the VRS stages had stronger correlations with the pre- and post-treatment VRS and PCL-R scores, pre-treatment Anger-in STAXI subscale, and post-treatment RPI. As a result, this hypothesis was partially supported.

CHAPTER 4: DISCUSSION

The main question of the current study was "what is the utility of the TTM, as measured by the URICA, for identifying treatment progress in violent adult male offenders?" After establishing that the current sample's URICA psychometric properties and cluster profiles were similar to those from previous studies, it appeared that the URICA was useful in identifying treatment progress in this sample. More specifically, the results indicated that the URICA's strength was in identifying short-term changes rather than long-term changes. This is consistent with past URICA research that the best results were for predicting short-term behaviours (e.g., treatment attendance, treatment completion).

There was a convergence of results from self-report, other-report, and official records. Positive changes tapped by self-report measures (i.e., less anger and antisocial attitudes, more knowledge of relapse prevention techniques) and staff-generated measures (i.e., increased GBC scores and decreased risk scores) indicated that improvement occurred during the six-month treatment program. There were statistically significant relationships between the cluster profile rankings and immediate measures of attitudes and behaviours (i.e., STAXI, CSS-M, and GBC scores). There were minimal relationships between cluster profile rankings and longer-term measures of behaviours (i.e., risk assessment measures and institutional misconduct/community recidivism). Investigation of the lack of relationship between the VRS stages and URICA cluster

profile rankings at post-treatment using post hoc analyses indicated that the URICA was more vulnerable to short-term fluctuations in mood or environment.

Part 1. The URICA and Developing Cluster Profiles

The investigation of the URICA's psychometric properties with a forensic population yielded promising results. Overall, the mean scores, inter-stage correlations, and internal consistencies of the URICA were similar to those found by McConnaughy et al. (1983, 1989), DiClemente and Hughes (1990), O'Hare (1996b), Hemphill and Howell (2000), McMurran et al. (1998), Pantalon and Swanson (2003), and Serin and Kennedy (1997). This replication suggested that the URICA contributed to better conceptualising violent offenders' behavioural change. However, the relatively high pre-treatment Action mean score and low internal consistency of the pre-treatment Maintenance stage (.69) implies the need for further refinement of the URICA for institutional forensic samples.

The mean Action score for the current sample was higher than the mean Action score for the comparison studies. This could have occurred for a number of different reasons. First, the Action score may be an accurate reflection of this sample's readiness for change. Although completing a treatment program would be part of these individuals' correctional treatment plans, they chose to attend the ABC program. This may reflect an action-oriented mindset that was tapped by the URICA. Second, it is possible that the high Action mean score represented individuals' willingness to attend treatment in order to satisfy a requirement of their correctional treatment plan (and reduce their security level and increase the possibility of parole), rather than readiness to change their violent behaviour. Thus, the Action score may have reflected treatment receptivity rather than readiness for change. Other authors (e.g., Carey et al., 1999) also expressed concern that

the URICA mixed these two constructs. This issue will be addressed later in this Discussion.

A third possibility is that the high pre-treatment Action stage score could be interpreted as individuals' attempts to present a socially desirable front (given the significant positive correlation [$r = .16$] between the Action score and the IM subscale of the PDS). Individuals may have felt a need to "prove" that they should be at the RPC. Since the corresponding post-treatment correlation was substantially weaker ($r = -.07$) it is likely that the socially desirable responding was due to poor insight at the start of treatment. Individuals had little understanding of the rules of the RPC upon arrival at the institution and may have believed that if they did not present as working on their problems they would not be allowed to remain. However, it is important to note that the average PDS scores for this sample were not clinically different from the norms published by Paulhus (1998). This is evidence that the individuals in this sample were not engaging in clinically significant amounts of socially desirable responding. This explanation complements Brigham's (1996) findings that the URICA was resistant to attempts to fake good, insofar as individuals instructed to fake good did not produce scores that were statistically different from those instructed to answer the questionnaire honestly.

A final consideration regarding the high Action score is that it may simply fall at the high end of the normal distribution of URICA scores. There is considerable variance among the comparison studies' mean URICA stage scores. For example, the average Contemplation score across comparison studies ranged from 1.57 to 4.32. However, taken together these studies are considered evidence for the psychometric soundness of the URICA across multiple populations. In order to further explore this variability in

scores, the mean stage scores from McConnaughy et al.'s (1983) study were compared to the mean scores of the other comparison studies. McConnaughy et al.'s (1983) study was chosen for comparison because its mean scores approximate the median in the distribution of comparison studies, and the participants were sampled from a variety of settings (private practice and military, university, and community counselling centres). Thirteen out of 32 mean score comparisons were significantly different. Thus, even this influential study is quite different from the other studies in this area of research. This matches Edens and Willoughby's (1999) conclusions that patterns of URICA scores should differ between groups that experience different problems (e.g., substance abuse vs. smoking vs. mental health). Given this, the URICA's psychometric properties have been found to be acceptable across studies (e.g., Davidson, 1998).

Unfortunately, it is not clear which option (readiness for change, receptivity to treatment, socially desirable responding, or normal distribution) is the most reasonable explanation for the high Action stage score in the current study. It is likely that all four play some role when the entire sample is considered, but some options are probably more relevant for specific individuals (e.g., some individuals were truly prepared for action whereas others were engaging in impression management). However, it is important to remember that the higher Action stage score did not affect the cluster analysis, as the URICA stage mean scores were standardised prior to conducting the cluster analysis in order to control for this potential problem.

It can be argued that the pre-treatment Maintenance stage alpha coefficient (.69) found in this study was a result of the vagueness and/or the readability of the URICA items. The URICA items do not specify the problem of interest. In the current study,

violence was not specified as the problem under consideration and individuals were not given specific instructions to interpret "problem" as violence (personal communication, C. DiPlacido, September 15, 2003), so there is a possibility of self-assessment "drift." For example, some individuals may have seen the "problem" under consideration as incarceration rather than violent behaviour.

However, the ambiguity of the URICA items cannot be the entire answer as acceptable alpha coefficients were found for the remaining stages. Item readability may have been a factor as individuals with lower reading abilities may have difficulty providing accurate responses, particularly to items identified by others (e.g., Jefferson, 1991; cited in Littrell & Girvin, 2002) as being poorly phrased (e.g., "I have been successful in working on my problem but I'm not sure I can keep up the effort on my own"). When the grade level needed to read the original URICA items was investigated, the Maintenance stage required the highest grade level (7.2). When the URICA was chosen as a pre- and post-treatment questionnaire for the ABC program, a number of items were reworded to improve their readability. The Maintenance stage remained the most difficult stage to read (grade level 6.5) despite these changes, and the interitem correlations in this stage are relatively low. It is possible that the internal consistency of the Maintenance stage was compromised when the items were reworded. It was concluded through post hoc analyses that the lower Maintenance stage alpha coefficient was likely the result of the higher grade level needed to understand the Maintenance stage questions in combination with the low interitem correlations. These problems are both inherent to the URICA and unique to this study. However, an alpha coefficient of .69 can be considered acceptable and therefore allowed for further analyses of the URICA.

There was evidence for convergent validity of the URICA as every cluster profile generated in the current study had been found in previous research. This indicated that the cluster profiles were fairly robust across populations and problems. There was support for the notion that readiness for change is a dynamic construct since a) the cluster profiles were successfully ranked in an ascending order that reflected differences in readiness for change, and b) individuals showed both progression and regression through the cluster profiles from pre- to post-treatment. The amount of progression, regression, and stability among this study's cluster profiles (22%, 39%, and 39%, respectively) was similar to that between the stages as reported by Norman et al. (1998; 39%, 17%, and 44%, respectively) and DiClemente (1999; 46%, 23%, and 31%, respectively).

There was also independent indirect support for the validity of the current study's cluster profiles. Since the profiles were not consistently related to demographic variables and socially desirable responding, this indicated that the URICA measured something that was independent of these variables.

The similarity of mean scores, interstage correlations, alpha coefficients, and cluster profiles to past research supports the argument that the current form of the URICA represents a starting point from which to study violence in incarcerated offenders. However, there are three issues to consider before applying the URICA to another high-risk forensic sample: unique characteristics of the population; unique characteristics of violence; and concerns that readiness for change is partially confounded with treatment receptivity in some URICA items.

Individuals in a forensic setting might be different from other individuals due to the consequences of engaging in their problem behaviours. While a smoker does not

necessarily experience immediate negative feedback when smoking, an offender engaging in violent behaviour within a correctional setting does (e.g., negative influence on security level, institutional charges, possibility of outside criminal charges). In an effort to avoid such sanctions, even Action-oriented individuals may be unlikely to admit to criminal lapses. This makes it more difficult (but not impossible) to assess individuals' progression or regression through the stages. In addition, stage of change may not have a strong relationship to reason for discharge from treatment in correctional settings. There are multiple extrinsic reasons for staying in treatment that may be more powerful than readiness for change (e.g., moving to lower security level, favourable treatment report for parole). This is consistent with the lack of significant relationship between the URICA cluster profiles and reason for discharge in the current study and similar to Willoughby and Edens' (1996) finding that neither length of time in substance abuse treatment nor treatment completion was related to cluster profile membership. They interpreted their findings as indicating that there were many potential external incentives for remaining in treatment beyond internal motivation.

It can be argued that violence is dissimilar to the health behaviours studied by past TTM researchers. Violence is risk posed to others rather than to oneself (as in smoking), and its interpersonal nature introduces complexity not seen in other risky health behaviours (e.g., the solitary nature of smoking). Harlow, Prochaska, Redding, Rossi, Velicer, Snow, et al. (1999) raised similar concerns regarding application of the TTM to sexual behaviours. In addition, violence has a low base rate (unlike smoking or substance abuse), which may increase its resistance to change. McGuire (2002) also expected antisocial behaviour to be more resistant to change than other behaviours. Aggression

may be resistant to change in some individuals since there are important genetic and neurobiological factors that predispose individuals to aggressive behaviour (e.g., Cadoret, Leve, & Devor, 1997; Kavoussi, Armstead, & Coccaro, 1997).

Receptivity for treatment may be confounded with readiness for change in the URICA. Carey et al. (1999) pointed out that while the URICA was designed to measure readiness for change, there is overlap with receptivity for treatment as reflected by "its development with psychotherapy patients and reference to a treatment context ("this place" or "here") in the wording of a number of its items" (p. 263). In an institutional setting, treatment receptivity could be associated with wanting parole, coping with boredom, or wanting an "easier" institutional placement. Some offenders may believe that improvement occurs spontaneously and without effort if one attends treatment, so there is no reason to be "ready" for anything. Treatment receptivity could also include a willingness to attend (but not participate) in treatment (DiClemente, 1999), a willingness to learn material but not apply it, attending so that others will not "nag", and getting information that confirmed a preconceived notion (e.g., "my problems are all due to my past abuse"). Given the extrinsic factors inmates face, the overlap between receptivity for treatment and readiness for change is likely to be an issue.

Part 2: Indicators of Change During Treatment

Part 2 explored whether change occurred in the context of treatment attendance. Although this study was not designed to establish the efficacy of the ABC treatment program, it was necessary to ensure that the expected changes in behaviours, attitudes, and risk occurred following treatment in order to use these measures to validate the URICA cluster profiles for a forensic sample. According to the self-report measures, by

the end of treatment individuals were experiencing fewer problems with anger and antisocial attitudes, and had greater understanding of relapse prevention concepts.

The increased knowledge of relapse prevention concepts provided additional evidence for the validity of the RPI as an indicator of treatment improvement. Between pre- and post-treatment there was significant improvement in RPI scores, indicating that individuals were successful at learning more about relapse prevention strategies. This is empirical evidence that the ABC treatment program adheres to the Needs principle.

The results with the CSS-M supported the idea that decreasing antisocial attitudes can lead to more prosocial behaviour as reported in Dowden and Andrews' (2000) meta-analysis. The post-treatment results showed increased support for lawful behaviour and increased acceptance of the needs for a justice system, and decreased support for a criminal lifestyle. However, there was no change in individuals' negative views toward the immediate agents of social control (i.e., the police). The lack of change in the Police subscale of the CSS-M may be related to offenders' contact with institutional correctional officers (i.e., police substitutes) that offenders may not always perceive as being fair.

The post-treatment STAXI results suggested a decrease in the intensity of anger, less suppression of angry feelings (perhaps to avoid the "pressure cooker" analogy), and more attempts to manage anger appropriately. Individuals still showed anger as frequently at post-treatment (i.e., nonsignificant change in the Anger-out subscale), but the anger was a less intense, more controlled display. These results support Dowden and Andrews' (2000) findings that reducing anger can lead to more prosocial behaviour. The significant reductions in post-treatment CSS-M and STAXI scores are further support that the ABC treatment program adheres to the Needs principle.

The ABC treatment program adheres to the Risk principle since the pre-treatment VRS and SRS scores indicated that high-risk violent offenders were the individuals selected into the program. The significant reductions in VRS and SRS scores at post-treatment provide direct support for the general efficacy of the ABC treatment program, and further support for the ABC treatment program adheres to the Needs principle.

The significant linear increase in GBC scores during treatment suggests that the ABC treatment program adhered to the Responsivity principle. Individuals were perceived as doing better in treatment rather than struggling against their therapists, and there was a low rate of therapist- and client-initiated termination from treatment.

Overall, the positive results in Part 2 provide support that the ABC treatment program adheres to the Risk, Needs, and Responsivity principles. Since the treatment-related measures (i.e., STAXI, CSS-M, RPI, VRS, SRS, and GBC) tapped change over time, this set the stage for examining the relationships between the cluster profile rankings and these measures.

Part 3: Relationships Between Cluster Profile Rankings and Self- and Staff-report Treatment Process Variables, Risk Variables, and Outcome Variables

The purpose of Part 3 was to provide evidence for the external validity of the URICA. This was accomplished by exploring the relationships between the cluster profile rankings and other forensic variables. At the end of treatment, individuals who were identified as being in less advanced cluster profiles performed differently from individuals in more advanced cluster profiles on both self- and staff-reported measures of change. These results supported the utility of this measure with a violent adult offender population.

There was limited previous research on the relationship between the stages of change and expression of anger. Results of the current study partially supported previous findings (e.g., Hemphill & Howell, 2000) in that individuals in more advanced cluster profiles admitted to more anger problems at pre-treatment. The significant pre-treatment correlation between Anger-in and URICA cluster profile rankings could be interpreted as meaning individuals from more advanced cluster profiles identified their problem (i.e., anger) but attempted to cope with it maladaptively (i.e., by "bottling" angry feelings). This is also consistent with Carney and Kivlahan (1995), DiClemente and Hughes (1990), and Willoughby and Edens' (1996) findings that individuals who are more ready to change are more aware of their problems and more willing to make attempts to change.

In the current study the positive relationship between anger expression and cluster profiles did not hold up at post-treatment. Instead, the correlations were primarily in the negative direction indicating that more advanced cluster profiles were associated with expressing less anger and being in better control of anger. Several factors working in combination may explain this switch in the anger – cluster profile relationship. One possible factor is that clients in more advanced cluster profiles learned to manage their feelings more appropriately by the end of treatment. It therefore fits with clinical expectations that individuals in more advanced cluster profiles were coping with their feelings better and reported less anger at post-treatment. Another possible factor is that the switch may be a function of treatment attendance, whereby individuals in less advanced cluster profiles become more comfortable admitting to problems with anger (although they are not necessarily managing these feelings). It is conceivable that admitting to angry feelings at pre-treatment was too ego-dystonic for individuals in less

advanced cluster profiles and too similar to admitting to having a problem (or not being able to control oneself). However, during treatment individuals are taught how to identify and manage feelings of anger, and by the end of treatment it may be easier for them to identify and admit to experiencing anger. Although individuals from less advanced cluster profiles may be better able to admit to feelings of anger at post-treatment, it is not clear whether they felt distressed by these feelings because this is not tapped by the STAXI. The role of distress could be useful to explore in future research since Miller (1985) reported that higher levels of distress contribute to motivation for treatment.

The strongest correlations between the pre-treatment cluster profiles and the CSS-M were interpreted as indicating that more advanced cluster profiles were associated with less identification with criminal others and less tolerance of crime. This could be interpreted as meaning that even before treatment began individuals from more advanced profiles rejected a criminal lifestyle. At post-treatment, more advanced cluster profiles were most strongly correlated with less tolerance of crime and more positive attitudes toward the police and the courts. It could be that offenders' interactions with treatment staff and treatment-oriented correctional officers may have led individuals from more advanced cluster profiles to develop more positive attitudes toward the agents of social control.

A clear relationship was also identified with cluster profile rankings and GBC scores. It appeared that individuals in more advanced profiles continued to improve throughout the entire 21 weeks of treatment while individuals in the less advanced profiles stopped improving with six weeks of treatment remaining. This drop-off in performance makes sense as the treatment material covered during the last six weeks

involves working on the most challenging Action-oriented material (personal communication, A. Gordon, October 24 2003). This is further evidence for the importance of providing stage-matched interventions to clients, and illustrates what may happen when individuals in less advanced stages are provided Action-oriented interventions.

However, the difference between individuals in the more and less advanced profiles was only evident during the second half of treatment. Individuals in more advanced cluster profiles may have received lower GBC scores than expected during the first half of treatment if they perceived that the treatment sessions were focused on irrelevant goals (e.g., Precontemplation-oriented strategies such as increasing motivation) that are effective with less ready clients. As a result, these more advanced individuals began to regress through the profiles. It is also possible that GBCs were generally low at the start of treatment because all individuals were adjusting to their new surroundings and staff attitudes (e.g., Schafer & Peternelj-Taylor, 2003). The steady increase in GBCs for individuals in more advanced profiles noted in the second half of treatment might be the result of matching the treatment techniques with these individuals' greater readiness for change (i.e., a stage-matched treatment effect).

The GBC results suggested that individuals in more advanced cluster profiles did not demonstrate large behavioural changes during treatment. Their performance could be described as "slow and steady." As a result, it may be unrealistic for therapists to expect clients from more advanced cluster profiles to be "shining stars," but instead could see them as diligent students who will make consistent progress given the appropriate interventions.

Conclusions drawn from these data must be interpreted cautiously due to the limited number of individuals with completed GBCs. In addition, while behavioural ratings by staff are useful adjuncts to self-report measures, "behavioral ratings require careful training of staff and efforts to ensure interrater reliability" (Serin, 1994; p. 8). Interrater reliabilities could not be computed for the GBC as individuals were only rated by one staff member each day.

Cluster profile rankings were not related significantly to knowledge of relapse prevention concepts. The post-treatment RPI scores for the five cluster profiles were quite similar, which suggested that individuals from all levels of readiness for change had learned the material. However, given the interpretations of what each cluster profile represents, individuals from less advanced cluster profiles would not necessarily apply what they learned. Their knowledge may be more akin to rote or book learning in that it would be short-term (i.e., for the module test) rather than long-term (i.e., through daily application). Thus, knowledge of material alone is insufficient to identify an individual's stage of change at post-treatment. This is an important consideration in forensic settings, in which inmates expect to be "quizzed" by treatment providers and National Parole Board members on what they have learned. While the ability to verbalise relapse prevention strategies demonstrates that an offender is *capable* of behaviour change, the assumption that he *has* changed because he can verbalise them is faulty in the absence of positive changes in attitudes, emotional control, and management of antisocial behaviour.

In addition, the cluster profile rankings were independent of risk for antisocial behaviour as measured by the VRS, SRS, and PCL-R. The essentially zero correlation between URICA cluster profile rankings and PCL-R scores may have resulted because

psychopathy is conceptualized as a stable personality construct whereas readiness for change is dynamic. This nonrelationship was similar to Greenstein et al.'s (1999) finding that there was no relationship between DSM-IV diagnoses (internalizing vs. externalizing) and cluster profile membership. The zero correlation in the current study can also be interpreted to mean that psychopathy and readiness for change are variables that are independent of each other. The weak correlations between the URICA cluster profile rankings and the VRS and SRS indicate that the URICA is not related to these measures. This is similar to Stewart and Millson's (1995) finding with high-risk offenders that risk estimation was not improved by considering motivation level as the recidivism rate of high-risk/low motivation offenders was not significantly different from that of high-risk/high motivation offenders (35.4% vs. 36.2%).

In the current study, the URICA's lack of relationship with the VRS, SRS, and PCL-R may help to explain why the URICA did not correlate strongly with long-term antisocial behaviour. There was some evidence for relationships between the cluster profile rankings and institutional misconduct/recidivism, by the emergence of correlations in the expected directions (seven of eleven correlations), although only one was significant. Time delays between the administration of the URICA and measuring misconduct/recidivism would weaken the relationship between the two variables, which is consistent with past research. Researchers have used the URICA to predict behaviour successfully on a short-term basis, either during treatment (e.g., Brogan et al., 1999; Derisley & Reynolds, 2000; Edens & Willoughby, 1999; Prochaska et al., 1992) or immediately following treatment (e.g., DiClemente et al., 1999; Franko, 1997; Wilson et al., 1997). In contrast, longer periods of time pose a problem; Dijkstra et al. (1998)

reported that the stages' predictive power for attempts to quit smoking weakened between three and fourteen months post-treatment. In the current study, the average follow-up period in an institution was 18.3 months and 22.4 months for community recidivism. It is possible that the length of time during the follow-up periods (especially for community recidivism) rendered the URICA cluster profiles inaccurate.

Other factors may have also weakened the relationship between cluster profile rankings and misconduct/recidivism. One statistical limitation with using the URICA to predict misconduct/recidivism is the measure's lack of wording specificity mentioned earlier. This decreases the likelihood the URICA could predict a specific, low base rate behaviour. In addition, after completing treatment at the RPC, individuals were still in settings where there was substantial external control over violent behaviour. This external control may further attenuate the URICA's ability to predict violence in institutional settings.

Given that there was no re-administration of the URICA during the follow-up period and a low base rate for the behaviours of interest, the interpretations offered regarding misconduct/recidivism should be taken with caution. It is likely that these findings may not be generalisable, and they should be considered as an exploratory look at the relationship between cluster profile rankings and criminal behaviour.

Part 4: Comparison of Cluster Profiles and VRS Stages

The VRS stages and cluster profile rankings were significantly correlated at pre-treatment but not at post-treatment. These findings raise the question whether these two instruments of readiness to change are measuring the same concept. Other researchers have identified disparities between different readiness for change instruments. When

Belding et al. (1996) administered both the URICA and a stage of change algorithm to methadone patients, they found a limited amount of stage convergence between the two measures (41% agreement). They commented that the two methods might measure similar but not identical phenomena, as the algorithm included questions about specific plans to alter behaviour whereas the URICA measured attitudes towards behaviour change. Unfortunately, Belding et al. (1996) did not cluster analyse their URICA results, and its psychometric properties were poor for the sample. In the current study, the URICA is a self-report measure that tapped attitudes toward a global problem (violent behaviour in general), whereas VRS stages were based on staff observations about specific risk behaviours related to violence. Hodgins (2001) compared clinicians' ratings of stages with self-report tests from an alcohol-dependent sample and reported poor to fair kappa coefficients. The author suggested "the reliability of staging methods based on these continuous measures, algorithms, and clinician global judgments is questionable" (p. 95).

A number of steps were taken in order to better understand the unexpected lack of relationship between the cluster profiles and VRS stages at post-treatment. Through post hoc analyses it was determined that there is preliminary support for the hypothesis that the different time frames implicit in scoring the URICA and the VRS resulted in the URICA being more likely to fluctuate in response to mood or environment.

When the strength of the correlations between cluster profile rankings and VRS stages with other variables were compared, VRS stages' better performance was limited primarily to stronger relationships with risk assessment measures. The VRS stages did not have statistically stronger correlations with variables related to post-RPC institutional

misconduct or community recidivism. It is possible that the stages (no matter how they are measured) lack long-term predictive validity, or the small number of individuals released to the street may have reduced the power of these analyses. The way the VRS stages are measured (i.e., staff perceptions) may also attenuate the stage–recidivism relationship. Staff perceptions of change may not be representative of actual behaviour, since antisocial behaviour (and prosocial behaviour) not observed by staff will occur. In addition, offenders' methods for establishing trust may be inconsistent with our conceptions of readiness for change. Offenders' choices to "test" staff to establish trust (e.g., Schafer & Peternelj-Taylor, 2003) may lead to erroneous perceptions that the offender is not willing to change.

Strengths and Limitations of the Current Study

The current study had several strengths. It was a "real world" study that did not limit treatment participation to individuals from particular criminal, ethnic, or demographic backgrounds. This increased the likelihood that the results were generalisable to other forensic settings. The probability that measurable change would occur was increased due to the ABC treatment program's adherence to the Risk, Needs, and Responsivity Principles and grounding in empirically supported treatment techniques. The likelihood that change would be detected was increased through collecting multiple types of data (i.e., self-report, other-report, official records) before, during, and after treatment. In addition, the current study was one of the few to report pre- and post-treatment data for violent offenders. In terms of readiness for change, the URICA was used as recommended by its developers (i.e., using cluster analysis to develop cluster

profiles) and the current study was the first to conduct cluster analyses on pre- and post-treatment URICA data with offenders.

Since this was a "real world" study, the research design of the current study had limitations. There were unequal *n*'s available at pre- and post-treatment which limited the nature of the pre- and post-treatment comparisons. Power was probably reduced since many individuals did not have complete data sets, resulting in small *n*'s available for some analyses. For example, there were few individuals available for follow-up at post-treatment and the follow-up period itself was relatively short in comparison to other studies (e.g., Olver & Wormith, 2002). Reliance on an archival database is also a potential limitation. It was not possible for the researcher to ensure that individuals were given standardized instructions for the completion of the self-report measures. This may have affected the reliability of these data.

The use of the URICA in this study could have been improved. It is possible that changing the wording of some URICA items to improve their readability changed the intent of those items and thereby reduced the overall validity of the measure. In addition, many of the results of this study are dependent upon the cluster profile rankings. Although the current rankings were based upon previous research and the shape, elevation, and scatter of the stage scores within each profile, it is possible that the optimal rankings were not identified. Different rankings would produce different results.

Due to the study's strengths (and despite its limitations), there was a convergence in results from the multiple sources of data (e.g., self-report, staff-report). It appeared that the URICA was useful for identifying short-term change in violent adult male

offenders. The consistency in results was even more interesting given the "noisy" data produced by this research design.

Recommendations for Future Research

Past research reported earlier showed that the URICA was used successfully to predict behaviour on a short-term basis, both during treatment (e.g., Prochaska et al., 1992) and immediately following treatment (e.g., DiClemente et al., 1991). Similarly, Dijkstra et al. (1998) reported that the stages' ability to predict behaviour change decreased between three and fourteen months post-treatment. These results may have influenced other researchers (e.g., Blanchard, Morgenstern, Morgan, Labouvie, & Bux, 2003; Simpson & Joe, 1993) to hypothesize that readiness for change was only predictive of relatively short-term change because it is a very fluid construct and therefore lacked sufficient stability over time to predict long-term change.

Although the current study was not designed to directly address the issue of whether the URICA measured change over a short-term period better than a long-term period, the results of the current study were reviewed to explore this possibility. For the sake of this exploration, study variables were identified as being acute dynamic (changing over days or weeks), stable dynamic (changing over months or years), or static (either not changing or only changing after several years). The CSS-M and STAXI were conceptualised as acute dynamic measures since it made clinical sense that changes in anger or antisocial attitudes could occur over a relatively short period of time. Mills and Kroner (2003) also described anger as an acute dynamic variable in their investigation of the association between anger and institutional misconduct/recidivism. The VRS and SRS were conceptualised as stable dynamic measures since it did not make clinical sense

that risk for violence would change dramatically over a short time frame due to its multi-faceted nature. The PCL-R was conceptualised as a static measure since psychopathy is a personality construct and therefore likely to be resistant to change over the short term. In order to determine whether the results supported these categorizations, correlations of the STAXI, CSS-M, VRS, SRS, and PCL-R scores with the most distal outcome behaviours (i.e., institutional misconduct/community recidivism) were compared. There were few significant correlations between the acute dynamic variables and the outcome behaviours, whereas the stable dynamic and static variables correlated significantly with the outcome behaviours at pre- and/or post-treatment (see Appendix H). These results can be interpreted as support for the three categories.

There were two sets of correlational results that could be interpreted as support for viewing the URICA as an acute dynamic variable. The URICA cluster profile rankings correlated more strongly with other acute variables (STAXI and CSS-M) than the stable dynamic and static variables (VRS, SRS, and PCL-R). In addition, the length of time between URICA administration and follow-up period for misconduct/recidivism appeared to influence the strength of the correlations between the URICA cluster profile rankings and institutional misconduct/community recidivism. These correlations were strongest when the URICA administration and the follow-up period occurred close together (i.e., post-treatment URICA and post-RPC misconduct) and weakest when they were farthest apart in time (i.e., pre-treatment URICA and community recidivism). In comparison, this pattern was not evident in the correlations between VRS stages and institutional misconduct/community recidivism. This may suggest that the VRS stages were less

influenced by the time factor. These results can be seen as tentative support for viewing the URICA as a measure that is better suited to identifying short-term changes.

Additional tentative support for the short-term nature of the URICA was found through post hoc analyses showing that the URICA was more susceptible to fluctuations in mood or environment (thereby reducing the strength of the correlation between URICA cluster profile rankings and VRS stages at post-treatment). Since most of the URICA items are worded in the present tense, it is more likely that the URICA was sensitive to negative fluctuations in mood or situation that occurred close to the time of test administration. The VRS stages would likely not be influenced as the rater must "determine the number of stages through which the individual has progressed since the commencement of treatment" (Wong & Gordon, 2002, p. 16), which in the current study was a period of several months.

The possible sensitivity of the URICA to negative fluctuations in mood or environment also helps to clarify the finding that while other self-report measures tapped positive changes at post-treatment (e.g., reduced anger), the cluster profile movement matrix identified a 39% regression rate in readiness to change. These discrepant results would be explained if readiness to change fluctuated more rapidly than degree of anger or antisocial attitudes.

Based on the previous research and the tentative support found in the current study, it appeared likely that readiness for change (as measured by the URICA) might be an acute dynamic construct. Researchers hoping to study readiness for change in forensic samples may benefit from administering the URICA and other TTM-related measures (e.g., processes of change) multiple times before, during, and after treatment in order to

establish a more dynamic description of change that would be superior to the current study's movement matrix (of course, the URICA items should be refined to reduce the measurement of treatment receptivity and increase the items' specificity to violence). Analysing the URICA's relationship with other study variables (e.g., risk measures) at these different points in time may help to determine the optimal predictive ability of the URICA. Multiple measurement periods would also provide data for the longitudinal prediction of stage/cluster profile transitions as recommended by Sutton (2000b), as it is possible that some individuals would be in different cluster profiles at each measurement time (reflecting their movement through the stages of change).

Incorporating other TTM-related measures into future data collection procedures would also help to improve the interpretability of the cluster profiles. For example, Velicer, Hughes, Fava, Prochaska, and DiClemente (1995) and Norman, Velicer, Fava, and Prochaska (2000) administered the stages of change algorithm to participants and then conducted dynamic typology analyses by having participants identify the pros, cons, and situational temptations for smoking. These data were used to identify subtypes within each stage of change (i.e., regressing, stable, progressing). This type of data would also be useful for the cluster profiles to identify whether individuals are in danger of regressing to an earlier profile, are stable in their cluster profile membership, or ready to progress to a more advanced cluster profile.

If future research provides more direct evidence that the URICA measures an acute dynamic construct, it would be most appropriate to use it to measure change in clinical presentation. This is similar to how the Beck Depression Inventory II (Beck, Steer, & Brown, 1996) is used in clinical practise. A therapist could administer the

URICA several times during the course of treatment in order to ascertain a client's current readiness to change and then implement stage-matched treatment techniques. In a forensic context, this would help to ensure that treatment providers are sensitive to Andrews' (1989) Responsivity principle.

CHAPTER 5: REFERENCES

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Appendix A

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UNIVERSITY ADVISORY COMMITTEE
ON ETHICS IN BEHAVIOURAL SCIENCE RESEARCH

NAME: S. Wong (K. Lewis) **BSC#:** 2001-125
Department of Psychology

DATE: July 17, 2001

The University Advisory Committee on Ethics in Behavioural Science Research has reviewed the revisions to the Application for Ethics Approval for your study "The Utility of the Transtheoretical Model of Change for Identifying Treatment Progress in Violent Adult Male Offenders" (01-125).

1. Your study has been APPROVED.

2. Any significant changes to your proposed study should be reported to the Chair for Committee consideration in advance of its implementation.

3. The term of this approval is for 5 years.

I wish you a successful and informative study.

Valerie Thompson, Chair
University Advisory Committee
on Ethics in Behavioural Science Research

VT/bk

Office of Research Services, University of Saskatchewan
Kirk Hall Room 210, 117 Science Place, Saskatoon SK S7N 5C8 CANADA
Telephone: (306) 966-8576 or (306) 966-2084 Facsimile: (306) 966-8597 http://www.usask.ca/research/

Correctional Service Canada | Service correctionnel Canada

Regional Psychiatric Centre – Research Review Committee

Project Approval Agreement - Non-CSC

Instructions: Please provide the following information by typing in the shaded areas.

of Project:

4: The Utility of the Transtheoretical Model of Change for Identifying Treatment Progress in Violent Adult Male Offenders

ipal Investigator(s) (name, institutional/departmental affiliation, and qualifications):

leen Lewis, M.A., Department of Psychology, University of Saskatchewan

nvestigator(s) (name, institutional/departmental affiliation, and qualifications):

tephen Wong, Director of Research, Regional Psychiatric Centre (Prairies)

Project Coordinator:

Vong

roval for this project has been granted by the RPC Research Review Committee, the Executive Director, and the ional Review Committee. Approval of this project enters the researcher into a contractual agreement with the rectional Service of Canada as per Commissioner's Directive on Research (009).

e), the undersigned, understand that in accepting the approval of this project and engaging in the research that:

Permission to conduct research may be withdrawn at any time for violations of rules and regulations related to institutional security concerns or unapproved deviations from the original proposal, or may be temporarily suspended for operational reasons,

I (we) will abide by CSC and RPC regulations, including those designed to ensure my own safety

Other than the report submitted for publication, no further release of data shall be made without the permission of the Service and/or the Ministry; and

I (we) will make appropriate acknowledgement on all reports of the sponsorship of the research by the Correctional Service of Canada, as well as an appropriate disclaimer that the opinions and conclusions do not necessarily represent those of the Service and/or Ministry.

) also agree to:

Provide a written description of any significant deviations from the original research proposal as soon as reasonably possible, which may require subsequent approval; and

Comply with the rules and regulations of the Privacy Act, and that no information will be disclosed in a form that could reasonably identify project participants to unauthorized persons.

(Note: When completing electronically, please insert your signature and the date)

[redacted] 20/07/01

ple Investigator *Date* *Principle Investigator* *Date*

ple Investigator *Date* *Principle Investigator* *Date*

[redacted] 20/07/01

Chair or Designate, Research Review Committee *Date*

Comments by RRC Members and Executive Director:

Appendix B

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Descriptions of Comparison Studies

	N	Age	Problem	Forensic	Setting	Services
DiClemete & Hughes (1990)	146 Males 78 Females	33	Alcoholism	No	Outpatient	Intake Assessment
O'Hare (1996)	160 Males 216 Females	32.4	Not stated	21% court ordered	Outpatient	Pre-treatment Assessment
Hemphill & Howell (2000)	175 Males 50 Females	15.5	Criminal Offending	Yes	Inpatient	Assessment
McConnaughy et al. (1983)	53 Males 99 Females	32.5	Various	No	Various Outpatient	Pre-treatment Assessment
McConnaughy et al. (1989)	155 Males 166 Women	33	Various	No	Outpatient	Pre-treatment Assessment
McMurran et al. (1998)	89 Males 26 Females	37.7	Criminal Offending	Yes	Inpatient	Pre-treatment Assessment
Pantalon & Swanson (2003)	97 Males 23 Females	33.9	Axis I & II Disorders	No	Inpatient	Pre-treatment Assessment
Serin & Kennedy (1997)	72 Males	37.7	Criminal Offending	Yes	Prison	Pre & Post-treatment

Appendix C

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Test C1

Original URICA (reproduced from Cancer Prevention Research Center, 1991)

This questionnaire is to help us improve services. Each statement describes how a person might feel when starting therapy or approaching problems in their lives. Please indicate the extent to which you tend to agree or disagree with each statement. In each case, make your choice in terms of how you feel right now, not what you have felt in the past or would like to feel. "Here" refers to the place of treatment or the program.

There are FIVE possible responses to each of the items in the questionnaire:

1 = Strongly Disagree 2 = Disagree 3 = Undecided 4 = Agree 5 = Strongly Agree

1. As far as I'm concerned, I don't have any problems that need changing. (PC)
2. I think I might be ready for some self-improvement. (C)
3. I am doing something about the problems that had been bothering me. (A)
4. It might be worthwhile to work on my problem. (C)
5. I'm not the problem one. It doesn't make much sense for me to be here. (PC)
6. It worries me that I might slip back on a problem I have already changed, so I am here to seek help. (M)
7. I am finally doing some work on my problem. (A)
8. I've been thinking that I might want to change something about myself. (C)
9. I have been successful in working on my problem but I'm not sure I can keep up the effort on my own. (M)
10. At times my problem is difficult, but I'm working on it. (A)

11. Being here is pretty much a waste of time for me because the problem doesn't have to do with me. (PC)
12. I'm hoping that this place will help me to better understand myself. (C)
13. I guess I have faults, but there's nothing that I really need to change. (PC)
14. I am really working hard to change. (A)
15. I have a problem and I really think I should work at it. (C)
16. I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem. (M)
17. Even though I'm not always successful in changing, I am at least working on my problem. (A)
18. I thought once I had resolved my problem I would be free of it, but sometimes I still find myself struggling with it. (M)
19. I wish I had more ideas on how to solve the problem. (C)
20. I have started working on my problems but I would like help. (A)
21. Maybe this place will be able to help me. (C)
22. I may need a boost right now to help me maintain the changes I've already made. (M)
23. I may be part of the problem, but I don't really think I am. (PC)
24. I hope that someone here will have some good advice for me. (C)
25. Anyone can talk about changing; I'm actually doing something about it. (A)
26. All this talk about psychology is boring. Why can't people just forget about their problems? (PC)
27. I'm here to prevent myself from having a relapse of my problem. (M)

28. It is frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved.
29. I have worries but so does the next guy. Why spend time thinking about them? (PC)
30. I am actively working on my problem. (A)
31. I would rather cope with my faults than try to change them. (PC)
32. After all I had done to try to change my problem, every now and again it comes back to haunt me. (M)

Note: Letters in parentheses indicate stage membership and would not appear on the actual test. PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance.

Test C2

Regional Psychiatric Centre URICA (from McConnaughy, Prochaska, & Velicer, 1983)

Read each statement and decide whether you agree or disagree with the statement. Using the scale, place your rating in the space provided.

1----------2----------3----------4----------5

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

1. As far as I'm concerned, I don't have any problems that need changing. (PC)
2. I think I might be ready for some self improvement. (C)
3. I am doing something about the problems that had been bothering me. (A)
4. It might be worthwhile to work on my problems. (C)
5. *I'm not the problem one. It doesn't make sense for me to try to change. (PC)*
6. *It worries me that I might slip back on a problem I have already changed. (M)*
7. I am finally doing some work on my problems. (A)
8. I've been thinking that I might want to change something about myself. (C)
9. I have been successful in working on my problem but I'm not sure I can keep up the effort on my own. (M)
10. At times my problem is difficult, but I'm working on it. (A)
11. *Making an effort to try to change is pretty much a waste of time because I don't have any problems. (PC)*
12. *I'm hoping I can learn to better understand myself. (C)*
13. I guess I have faults, but there's nothing that I really need to change. (PC)
14. I am really working hard to change. (A)

15. I have a problem and I really think I should work on it. (C)

16. I'm not following through with what I had already changed as well as I had hoped. (M)

17. Even though I'm not always successful in changing, I am at least working on my problems. (A)

18. I thought that if I had solved the problem I would be free of it, but sometimes I still find myself struggling with it. (M)

19. I wish I had more ideas on how to solve my problems. (C)

20. I have started working on my problems but I would like help. (A)

21. Maybe talking to someone will be able to help me. (C)

22. I may need a boost right now to help me maintain the changes I've already made. (M)

23. I may be part of the problem, but I don't really think I am. (PC)

24. I hope that someone will have some good advice for me. (C)

25. Anyone can talk about changing; I'm actually doing something about it. (A)

26. All the talk about changing is boring. Why can't people just forget about their problems? (PC)

27. I am trying hard to prevent myself from having a relapse of my problem. (M)

28. It's frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved. (M)

29. I have worries but so does the next person. Why spend time thinking about them? (PC)

30. I am actively working on my problem. (A)

31. I would rather cope with my faults than try to change them. (PC)

32. After all I had done to try to change my problem, every now and again it comes back to haunt me. (M)

Note: Italicized items indicate major wording changes from the original URICA. Letters in parentheses indicate stage membership and would not appear on the actual test. PC = Precontemplation, C = Contemplation, A = Action, M = Maintenance.

Post Hoc Analyses of Low Maintenance Stage Alpha Coefficient

The alpha coefficient for each pre-treatment URICA stage score was computed separately for individuals in more and less advanced profile clusters. Results showed that individuals in more advanced cluster profiles answered the URICA in a manner that resulted in higher alpha coefficients across all stage scores (see Table C1). The alpha coefficients in this table are systematically lower than those found in the main results section due to the smaller sample sizes available for these analyses.

Table C1

More and Less Advanced Cluster Profiles Alpha Coefficients

	More Advanced Cluster Profiles	Less Advanced Cluster Profiles
Precontemplation	.64	.58
Contemplation	.56	.55
Action	.68	.46
Maintenance	.70	.62

Appendix D

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Movement Matrix Post Hoc Analyses

T tests were completed comparing the "extreme" regressors and the remaining sample on descriptive information and self-report questionnaires. One significant difference was found with post-treatment Anger-in score (see Tables D1 and D2).

Table D1

Comparison of Regressors and Remaining Sample on Descriptive Variables and CSS-M

	Regressors	Remaining Sample	*t* test
Age	28.44 (9)	31.66 (180)	$t(187) = 1.05$
Sentence	92.63 (8)	86.36 (137)	$t(143) = -.33$
Education	9.88 (8)	9.65 (167)	$t(173) = -.33$
Pre Total	31.33 (9)	29.69 (176)	$t(183) = -.30$
Pre Law	5.67 (9)	5.11 (176)	$t(183) = -.40$
Pre Court	6.89 (9)	7.59 (176)	$t(183) = .50$
Pre Police	6.11 (9)	5.88 (176)	$t(183) = -.18$
Pre TLV	7.89 (9)	6.55 (176)	$t(183) = -.79$
Pre ICO	4.78 (9)	4.56 (176)	$t(183) = -.28$
Post Total	25.00 (9)	21.48 (116)	$t(123) = -.79$
Post Law	4.44 (9)	3.61 (116)	$t(123) = -.79$
Post Court	6.11 (9)	5.25 (116)	$t(123) = -.63$
Post Police	5.22 (9)	5.53 (116)	$t(123) = .32$
Post TLV	5.33 (9)	3.72 (116)	$t(8) = -.75$
Post ICO	3.89 (9)	3.38 (116)	$t(123) = -.69$

Table D2

Comparison of Regressors and Remaining Sample on RPI, STAXI, PDS, and IQ

	Regressors	Remaining Sample	*t* test
Pre RPI	55.43 (7)	51.29 (135)	$t(140) = -1.05$
Post RPI	61.83 (6)	59.49 (90)	$t(94) = -.62$
Pre State Anger	16.56 (9)	11.99 (174)	$t(8.19) = -1.65$
Pre Trait Anger	20.89 (9)	18.34 (174)	$t(181) = -1.29$
Pre Anger-in	19.33 (9)	16.24 (174)	$t(181) = -1.93$
Pre Anger-out	17.33 (9)	15.75 (174)	$t(181) = -1.30$
Pre Anger Control	21.33 (9)	22.29 (174)	$t(181) = .48$
Post State Anger	11.11 (9)	10.86 (116)	$t(123) = -.31$
Post Trait Anger	18.11 (9)	15.49 (116)	$t(123) = -1.77$
Post Anger-in	16.89 (9)	13.51 (116)	$t(123) = -2.38$*
Post Anger-out	16.33 (9)	15.23 (116)	$t(123) = -1.09$
Post Anger Control	22.56 (9)	25.20 (116)	$t(123) = 1.39$
Post SDE	3.86 (7)	4.74 (136)	$t(141) = .62$
Post IM	4.14 (7)	5.26 (136)	$t(141) = .73$
Post SDE	3.67 (6)	5.18 (91)	$t(95) = 1.34$
Post IM	3.67 (6)	4.47 (91)	$t(95) = .60$
Quick Test Percentile	34.44 (9)	33.60 (167)	$t(12.11) = -.19$

Note: Numbers in brackets represent number of individuals.

* $p < .05$

T tests were completed comparing the "extreme" progressors and the remaining sample on descriptive information and self report questionnaires (see Tables D3 and D4). No significant results were found.

Table D3

Comparison of Progressors and Remaining Sample on Descriptive Variables and CSS-M

	Progressors	Remaining Sample	*t* test
Age	28.33 (9)	31.66 (180)	t (10.73) = 1.84
Sentence	47.25 (4)	86.36 (137)	t (139) = 1.52
Education	10.38 (8)	9.65 (167)	t (173) = -1.09
Pre Total	32.67 (9)	29.69 (176)	t (183) = -.54
Pre Law	4.00 (9)	5.11 (176)	t (183) = .81
Pre Court	8.44 (9)	7.59 (176)	t (183) = -.60
Pre Police	6.56 (9)	5.88 (176)	t (183) = -.54
Pre TLV	8.11 (9)	6.55 (176)	t (183) = -.91
Pre ICO	5.56 (9)	4.56 (176)	t (183) = -1.26
Post Total	25.78 (9)	21.48 (116)	t (123) = -.99
Post Law	3.89 (9)	3.61 (116)	t (123) = -.27
Post Court	5.89 (9)	5.25 (116)	t (123) = -.48
Post Police	6.00 (9)	5.53 (116)	t (123) = -.50
Post TLV	5.44 (9)	3.72 (116)	t (123) = -1.29
Post ICO	4.56 (9)	3.38 (116)	t (123) = -1.54

Table D4

Comparison of Progressors and Remaining Sample on RPI, STAXI, PDS, and IQ

	Progressors	Remaining Sample	*t* test
Pre RPI	52.00 (7)	51.29 (135)	$t(140) = -.18$
Post RPI	57.14 (7)	59.49 (90)	$t(95) = .67$
Pre State Anger	11.33 (9)	11.99 (174)	$t(181) = .49$
Pre Trait Anger	20.78 (9)	18.34 (174)	$t(8.33) = -.80$
Pre Anger-in	14.67 (9)	16.24 (174)	$t(181) = .99$
Pre Anger-out	17.33 (9)	15.75 (174)	$t(8.25) = -.72$
Pre Anger Control	22.00 (9)	22.29 (174)	$t(181) = .15$
Post State Anger	10.11 (9)	10.86 (116)	$t(123) = .94$
Post Trait Anger	16.56 (9)	15.49 (116)	$t(123) = -.75$
Post Anger-in	13.67 (9)	13.51 (116)	$t(123) = -.11$
Post Anger-out	15.22 (9)	15.23 (116)	$t(123) = .01$
Post Anger Control	24.00 (9)	25.20 (116)	$t(123) = .62$
Post SDE	5.57 (7)	4.74 (136)	$t(141) = -.58$
Post IM	5.29 (7)	5.26 (136)	$t(141) = -.01$
Post SDE	6.14 (6)	5.18 (91)	$t(96) = -.92$
Post IM	4.86 (6)	4.47 (91)	$t(96) = -.30$
Quick Test Percentile	34.44 (9)	33.60 (167)	$t(174) = -.10$

T tests were completed comparing the "extreme" regressors and the remaining sample on the VRS, PCL-R, and SRS scores (see Table D5). No significant results were found.

Table D5

Comparison of Regressors and Remaining Sample on VRS, PCL-R, and SRS

	Regressors	Remaining Sample	*t* test
Pre Static	14.67 (9)	13.07 (180)	$t(187) = -1.33$
Pre Dynamic	42.22 (9)	44.67 (180)	$t(187) = -1.34$
Pre Total	60.89 (9)	58.73 (180)	$t(187) = .83$
Post Static	14.67 (9)	13.05 (180)	$t(187) = -.59$
Post Dynamic	37.17 (9)	40.27 (180)	$t(187) = 1.07$
Post Total	55.76 (9)	54.10 (180)	$t(187) = -.45$
Pre Total – Post Total	5.13 (9)	4.64 (180)	$t(187) = -.48$
PCL-R Total	24.21 (9)	24.73 (180)	$t(187) = .24$
Factor 1	8.56 (9)	8.69 (180)	$t(187) = .11$
Factor 2	12.10 (9)	12.22 (180)	$t(187) = .11$
Pre SRS Score	21.44 (5)	21.99 (117)	$t(120) = .26$
Post SRS Score	20.33 (6)	20.58 (132)	$t(136) = .12$

T tests were completed comparing the "extreme" progressors and the remaining sample on the VRS, PCL-R, and SRS scores (see Table D6). No significant results were found.

Table D6

Comparison of Progressors and Remaining Sample on VRS, PCL-R, and SRS

	Progressors	Remaining Sample	*t* test
Pre Static	13.44 (9)	13.07 (180)	t (187) = -.31
Pre Dynamic	44.56 (9)	44.67 (180)	t (187) = .04
Pre Total	59.53 (9)	58.73 (180)	t (187) = -.22
Post Static	13.33 (9)	13.05 (180)	t (187) = -.24
Post Dynamic	38.39 (9)	40.27 (180)	t (187) = .65
Post Total	53.08 (9)	54.10 (180)	t (187) = .27
Pre Total – Post Total	6.45 (9)	4.64 (180)	t (187) = -1.79
PCL-R Total	26.06 (9)	24.73 (180)	t (187) = -.62
Factor 1	9.11 (9)	8.69 (180)	t (187) = -.35
Factor 2	12.79 (9)	12.22 (180)	t (187) = -.56
Pre SRS Score	23.44 (6)	21.99 (117)	t (121) = -.77
Post SRS Score	22.14 (6)	20.58 (132)	t (136) = -.77

The average number of institutional misconducts post-RPC for the "extreme" regressors was 4.44 (n = 9) and 6.00 (n = 176) for the remaining sample; these values did not differ statistically (t [183] = .20). The average number of institutional misconducts post-RPC for the "extreme" progressors was 5.25 (n = 8) and 6.00 (n = 176) for the remaining sample. These values did not differ statistically (t [182] = .09).

Comparisons were not conducted using the GBC and amount of community recidivism due to small sample sizes and resulting lack of power. Only three of the "extreme" regressors and three of the "extreme" progressors had GBC data. One of the "extreme" progressors recidivated.

There were no significant relationships between "extreme" regressors, "extreme" progressors, and the remaining sample with discharge reason (χ^2 [2, n = 121] = .176, p =

.916), marital status (χ^2 [2, n = 122] = 1.309, p = .520), ethnicity (χ^2 [4, n = 123] = 2.334, p = .675), or occupation (χ^2 [6, n = 105] = .402, p = .999).

The standardized URICA factor scores of the "extreme" regressors were compared to the standardized URICA factor scores of the rest of the individuals in the Immotive cluster profile at post-treatment (see Table D7). There were significant differences for the Precontemplation and Contemplation scores.

Table D7

Comparison of Regressors and others in the Immotive Cluster Profile

	Regressors	Regular Immotive	*t* test
Post-treatment Precontemplation	50.87 (9)	54.53 (41)	t (48) = -2.20*
Post-treatment Contemplation	50.72 (9)	43.90 (41)	t (48) = 2.93***
Post-treatment Action	44.41 (9)	41.66 (41)	t (48) = 1.42
Post-treatment Maintenance	54.70 (9)	51.60 (41)	t (48) = 1.46

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

Appendix E

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Relationship between PDS and Self-Report Measures

PDS and URICA

At pre-treatment, the SDE subscale was not significantly correlated with any URICA stage score. There were significant correlations between the IM subscale and the Action and Maintenance stage scores (see Table E1).

At post-treatment, the SDE subscale was significantly negatively correlated with the Maintenance stage score. No significant correlations were found with the IM subscale (see Table E1).

Table E1

PDS and URICA

	Pre-treatment (n = 150)		Post-treatment (n = 100)	
	SDE	IM	SDE	IM
Precontemplation	.03	.02	-.17	-.15
Contemplation	.02	.06	-.07	-.02
Action	.14	.16*	.05	-.07
Maintenance	-.16	-.18*	-.40****	-.16

* $p < .05$. **** $p < .001$.

PDS and CSS-M

At pre-treatment, the SDE subscale was significantly correlated with two subscales and the total score of the CSS-M. There were significant negative correlations between the IM subscale and every CSS-M subscale (see Table E2).

At post-treatment, SDE scores were significantly negatively correlated with the total CSS-M score and each CSS-M subscale. IM scores correlated significantly in a negative direction with the total score, Law, TLV, and ICO subscales.

Table E2

PDS and CSS-M

	Pre-treatment (n = 150)		Post-treatment (n = 104)	
	SDE	IM	SDE	IM
CSS-M	-.17*	-.32****	-.36****	-.25**
Law	-.15	-.18*	-.27**	-.25**
Court	-.18*	-.38****	-.36****	-.13
Police	-.16	-.27****	-.26**	-.18
TLV	-.08	-.25***	-.30**	-.20*
ICO	-.18*	-.27****	-.20*	-.29**

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

PDS and RPI

SDE scores did not correlate significantly with RPI scores at either pre-treatment (r = -.10, p = .119, n = 148) or post-treatment (r = .12, p = .123, n = 102). IM scores did not correlate significantly with RPI scores at either pre-treatment (r = .02, p = .393, n = 148) or post-treatment (r = .14, p = .076, n = 102).

PDS and STAXI

At both pre- and post-treatment there was a pattern for IM and SDE scores to correlate negatively with STAXI subscales, except for the Anger Control subscale where higher scores indicated efforts to monitor and control angry feelings (see Table E3).

At pre-treatment, SDE correlated significantly with two STAXI subscales. In contrast, IM correlated significantly with every subscale except State Anger. At post-treatment, the results between IM and SDE were reversed. SDE correlated significantly with three of the five STAXI subscales. IM correlated significantly with one STAXI subscale.

Table E3

PDS and STAXI

	Pre-treatment (n = 149)		Post-treatment (n = 104)	
	SDE	IM	SDE	IM
State Anger	-.13	-.03	-.18	-.07
Trait Anger	-.10	-.36****	-.42****	-.19
Anger-in	-.17*	-.33****	-.47****	-.24*
Anger-out	.06	-.26****	-.17	-.17
Anger Control	.20*	.39****	.31****	.17

* $p < .05$. **** $p < .001$.

Appendix F

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Psychopathy with Risk, GBC, Institutional Misconduct, and Recidivism

Section I: Psychopathy and the Violence Risk Scale

Hypothesis: PCL-R scores will correlate positively with VRS scores (total, static, and dynamic).

One-tailed correlational analyses were used to explore the relationship between psychopathy and risk as measured by the VRS. PCL-R total, Factor 1, and Factor 2 scores were significantly positively correlated with the VRS static, dynamic, and total scores at both pre- and post-treatment (see Table F1). Post-treatment VRS total scores were subtracted from pre-treatment VRS total scores to develop a VRS change score. Factor 1 was correlated significantly with this change score, suggesting that greater Factor 1 scores were associated with less change in risk.

Table F1

Psychopathy and change in Risk Correlations

	PCL-R Total	PCL-R Factor 1	PCL-R Factor 2	*N*
VRS Change Score	-.10	-.17**	-.03	198
Pre-treatment VRS Static	.50****	.12*	.72****	198
Pre-treatment VRS Dynamic	.63****	.38****	.64****	198
Pre-treatment VRS Total	.70****	.37****	.77****	198
Post-treatment VRS Static	.50****	.13*	.72****	198
Post-treatment VRS Dynamic	.70****	.46****	.67****	198
Post-treatment VRS Total	.72****	.41****	.76****	198

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

Hypothesis: Psychopaths will score significantly higher than nonpsychopaths on the VRS.

Psychopaths' and nonpsychopaths' scores were compared using one-tailed independent *t* tests (see Table F2). Psychopaths had significantly greater risk scores at

both pre- and post-treatment and demonstrated significantly less change in their risk levels. After treatment, psychopaths' VRS total scores dropped an average of three points whereas nonpsychopaths' scores dropped an average of five points.

Table F2

Psychopathy and change in Risk *t* tests

	Psychopath	Nonpsychopath	*t* test
VRS Change Score	3.15	5.19	$t(196) = 4.15$****
Pre-treatment VRS Static	14.25	12.85	$t(196) = -2.38$**
Pre-treatment VRS Dynamic	48.11	43.54	$t(196) = -3.22$****
Pre-treatment VRS Total	64.48	57.26	$t(112.38) = -5.33$****
Post-treatment VRS Static	14.27	12.81	$t(196) = -2.48$**
Post-treatment VRS Dynamic	45.71	38.43	$t(85.06) = -6.09$****
Post-treatment VRS Total	61.33	52.07	$t(103.62) = -6.68$****
N	44	154	

** $p < .01$. **** $p < .001$.

Section II: Psychopathy and the SRS

Hypothesis: PCL-R scores will correlate positively with SRS scores (total and category).

One-tailed correlational analyses were used to determine the nature of the relationship between the PCL-R and the SRS. PCL-R Total, Factor 1, and Factor 2 scores were correlated significantly with SRS scores at pre- and post-treatment. When divided into SRS-based security classification categories (i.e., minimum, medium, maximum), PCL-R Total, Factor 1, and Factor 2 scores were correlated significantly with security classification at both pre- and post-treatment (see Table F3).

Table F3

Relationship between Psychopathy and SRS

	PCL-R Total	PCL-R Factor 1	PCL-R Factor 2	*n*
Pre-treatment SRS Score	.39****	.23***	.47****	128
Pre-treatment SRS Category	.27****	.18**	.30****	183
Post-treatment SRS Score	.44****	.30****	.39****	144
Post-treatment SRS Category	.35****	.30****	.23****	169

** $p < .01$. *** $p < .005$. **** $p < .001$.

Hypothesis: Psychopaths will score significantly higher than nonpsychopaths on the SRS.

Psychopaths' and nonpsychopaths' SRS scores were compared using one-tailed independent *t* tests (see Table F4). Psychopaths had significantly higher SRS scores and security classifications than nonpsychopaths at both pre- and post-treatment.

Table F4

Psychopaths versus Nonpsychopaths using the SRS

	P	NP	*t* tests	*n*
Pre-treatment SRS Score	24.69	21.30	$t(126) = -3.68$****	P = 28 NP = 100
Pre-treatment SRS Category	2.39	2.15	$t(56.04) = -2.80$***	P = 41 NP =142
Post-treatment SRS Score	24.62	19.72	$t(142) = -5.20$****	P = 27 NP =117
Post-treatment SRS Category	2.38	1.93	$t(167) = -4.03$****	P = 32 NP = 137

Note: P = Psychopaths, NP = Nonpsychopaths.

*** $p < .005$. **** $p < .001$.

Overall, psychopaths demonstrated greater degrees of risk than nonpsychopaths and their risk for violence changed significantly less as the result of treatment.

Section III: Psychopathy and the GBC

Hypothesis: PCL-R scores will correlate negatively with GBC scores and psychopaths will score lower than nonpsychopaths on the weekly GBC scores.

One-tailed correlational analyses were used to determine the relationship between psychopathy and GBC scores. There were relatively few (10/63) significant correlations between GBC scores and the PCL-R total, Factor 1, or Factor 2 scores but most (48/63) were in the expected negative direction (see Table F5). PCL-R total scores correlated negatively with GBC scores at weeks three, four, five, and ten. Factor 2 scores correlated negatively with GBC scores at weeks four, five, seven, and ten. Factor 1 scores correlated negatively with GBC scores at weeks seventeen and eighteen.

Table F5

Relationship between Psychopathy and Treatment Behaviour

	PCL-R Total	PCL-R Factor 1	PCL-R Factor 2	*n*
Week 1	-.02	.09	-.15	66
Week 2	-.06	-.01	-.11	67
Week 3	-.21*	-.18	-.18	67
Week 4	-.21*	-.14	-.25*	67
Week 5	-.21*	-.17	-.23*	67
Week 6	-.16	-.12	-.17	66
Week 7	-.12	.05	-.28**	66
Week 8	.07	.08	.05	66
Week 9	-.10	-.05	-.09	65
Week 10	-.23*	-.16	-.27*	65
Week 11	.10	.03	.18	65
Week 12	-.21	-.18	-.16	57
Week 13	-.11	-.08	-.13	55
Week 14	-.10	-.17	-.10	53
Week 15	.01	-.02	-.02	53
Week 16	-.09	-.04	-.17	53
Week 17	-.17	-.26*	-.08	53
Week 18	-.15	-.24*	-.05	53
Week 19	-.02	-.09	.01	53
Week 20	.07	.02	.06	53
Week 21	.08	-.04	.11	53

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

Psychopaths' and nonpsychopaths' GBC scores were compared using one-tailed independent *t* tests (see Table F6). Psychopaths' and nonpsychopaths' GBC scores were significantly different at two points (weeks 10 and 18) during the course of treatment.

However, observed differences in scores were in the expected direction (i.e., nonpsychopaths received higher scores) for 19 out of 21 weeks.

Table F6

Psychopaths' versus Nonpsychopaths' Behaviour in Treatment

	Psychopaths	Nonpsychopaths	*t* test
Week 1	3.23	3.51	$t(51) = .81$
Week 2	3.14	3.46	$t(51) = 1.39$
Week 3	3.22	3.42	$t(19) = 1.02$
Week 4	3.30	3.58	$t(51) = 1.57$
Week 5	3.55	3.63	$t(51) = .41$
Week 6	3.36	3.58	$t(51) = 1.25$
Week 7	3.52	3.45	$t(51) = -.30$
Week 8	3.71	3.59	$t(51) = -.56$
Week 9	3.32	3.53	$t(51) = .98$
Week 10	3.24	3.61	$t(18.918) = 1.95$*
Week 11	3.67	3.75	$t(51) = .39$
Week 12	3.56	3.68	$t(51) = .59$
Week 13	3.64	3.81	$t(51) = .95$
Week 14	3.57	3.86	$t(51) = 1.25$
Week 15	3.91	4.02	$t(51) = .51$
Week 16	3.72	3.90	$t(19.046) = .87$
Week 17	3.43	3.84	$t(17.589) = 1.39$
Week 18	3.42	3.95	$t(51) = 2.22$*
Week 19	3.46	3.71	$t(51) = .96$
Week 20	3.48	3.68	$t(51) = .71$
Week 21	3.30	3.67	$t(51) = .97$
n	13	40	

* $p < .05$.

When the GBC scores over the entire course of treatment were graphed separately for nonpsychopaths and psychopaths, there was an interesting pattern. The figure for nonpsychopaths (see Figure F1) approximates that of the entire sample seen earlier in Figure 11. A linear regression was computed for the nonpsychopaths over the 21 weeks of treatment and a correlation of .75 was found between GBC scores and week in treatment (R^2 = .56). This correlation is similar to the results found for the entire sample over the 21 weeks of treatment. In contrast, the figure for the psychopaths contained many more "peaks" and "valleys" (see Figure F2). A linear regression computed for the psychopaths over the 21 weeks of treatment identified a correlation of .45 between GBC scores and week in treatment (R^2 = .20). This correlation was noticeably smaller than the one found for the nonpsychopaths and the larger sample.

Overall, there were no consistent significant relationships between psychopathy and treatment behaviours, and psychopaths did not always perform significantly worse than nonpsychopaths during treatment when the GBC scores were compared. However, there were trends for psychopaths to do worse. It appeared that psychopaths were much less consistent in how well they performed. There was noticeable fluctuation in the scores received by psychopaths whereas there was a clear trend for increasingly better scores for the nonpsychopaths.

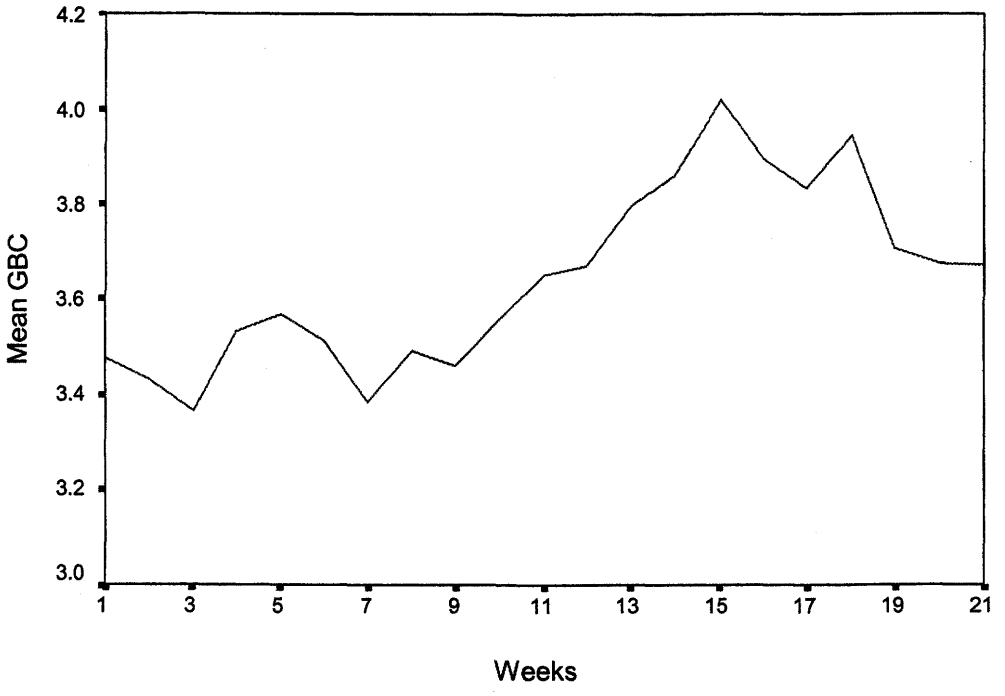

Figure F1. Nonpsychopaths over course of treatment.

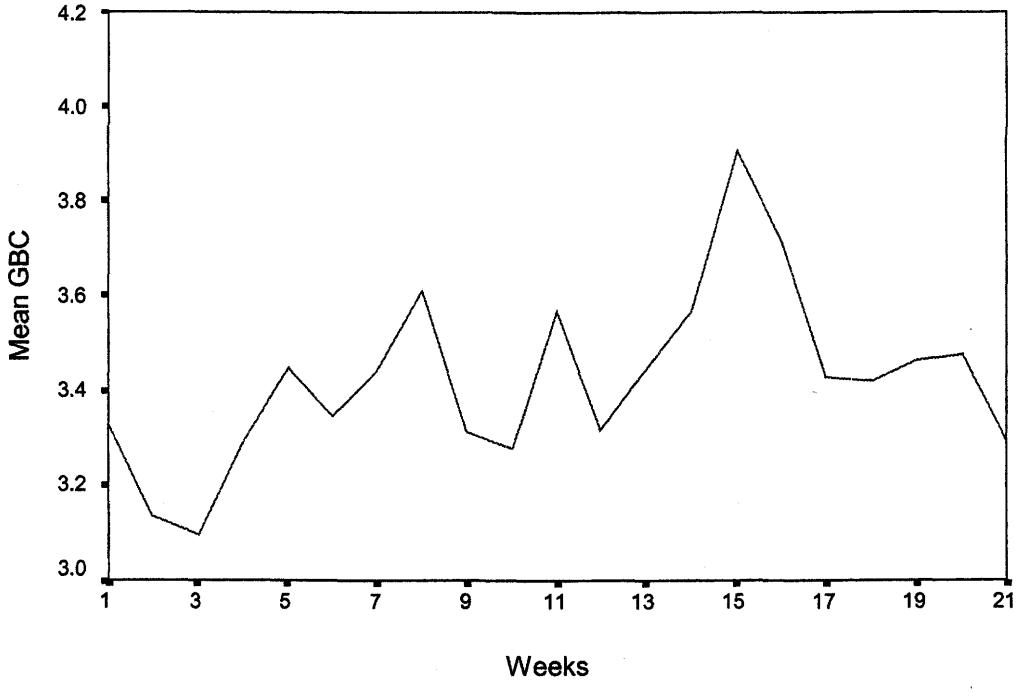

Figure F2. Psychopaths over the course of treatment.

Section IV: Psychopathy and Institutional Misconduct

Hypothesis: PCL-R scores will correlate positively with the amount of institutional misconduct and correlate negatively with time to first misconduct.

One-tailed correlational analyses were used to determine the relationship between psychopathy and institutional misconduct after attending RPC. There was a significant positive correlation between PCL-R total score and the amount of non-violent misconduct, and significant positive correlations between Factor 1 and amount of non-violent and violent misconducts (see Table F9). There were significant negative correlations between PCL-R total score and Factor 2 with number of months to first non-violent misconduct. However, it was not expected for PCL-R total and factor scores to correlate positively (although nonsignificantly) with time to first violent misconduct.

Table F9

Relationship between Psychopathy and Post-RPC Institutional Misconduct

	PCL-R Total	PCL-R Factor 1	PCL-R Factor 2	*n*
# of Non-violent Misconduct	.14*	.15*	.09	193
# of Months to 1st Non-violent Misconduct	-.16*	-.09	-.19*	123
# of Violent Misconduct	.09	.14*	.01	193
# of Months to 1st Violent Misconduct	.19	.07	.13	29

* $p < .05$.

Hypothesis: Psychopaths will receive significantly more institutional misconducts and significantly earlier than nonpsychopaths.

Psychopaths' and nonpsychopaths' institutional misconduct after RPC was compared using one-tailed independent *t* tests (see Table F10). There was a significant

result for psychopaths to receive their first non-violent institutional misconduct following their time at RPC earlier than nonpsychopaths. There was no difference between psychopaths and nonpsychopaths in relation to time to first violent misconduct. All other comparisons were nonsignificant but in the expected direction.

Table F10

Psychopaths' versus Nonpsychopaths' Post-RPC Institutional Misconduct

	P	NP	*t* tests	*n*
# of Non-violent Misconduct	7.67	4.36	$t(191) = -1.22$	P = 43 NP =150
# of Violent Misconduct	1.05	.73	$t(191) = -.29$	P = 43 NP = 150
# of months to 1st Non-violent Misconduct	3.55	7.52	$t(119.36) =$ 3.49****	P = 32 NP = 91
# of months to 1st Violent Misconduct	11.25	11.11	$t(27) = -.04$	P = 10 NP = 19

Note: P = Psychopath, NP = Nonpsychopath.

**** $p < .001$.

Section V: Psychopathy and Recidivism

Hypothesis: PCL-R scores will correlate positively with the amount of community recidivism, and correlate negatively with time to first recidivism.

One-tailed correlational analyses were used to determine the relationship between psychopathy and criminal offences. Individuals were included in these analyses if they had been released to the community for at least nine months following treatment at RPC. There were significant correlations between PCL-R total and Factor scores with amount

of recidivism after leaving prison (see Table F11). Factor 2 had a significant negative correlation with the number of months to first community recidivism. All other correlations were nonsignificant but in the expected direction.

Table F11

Relationship between Psychopathy and CPIC Non-violent Offences

	PCL-R Total	PCL-R Factor 1	PCL-R Factor 2	*n*
Any Recidivism	.37***	.28*	.28*	50
# of months to 1st Recidivism	-.22	-.15	-.32*	33

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

Hypothesis: Psychopaths will receive significantly more community recidivism and significantly earlier than nonpsychopaths.

Psychopaths' and nonpsychopaths' criminal behaviour after release from prison was compared using one-tailed independent *t* tests (see Table F12). All comparisons were nonsignificant but were in the expected direction (i.e., psychopaths committing more crimes and doing so earlier than nonpsychopaths).

Table F12

Psychopaths' versus Nonpsychopaths' CPIC Offences

	P	NP	*t* tests	*n*
Any Recidivism	5.36	2.17	$t(14.73) = -1.66$	P = 14 NP = 36
# of months to 1st Recidivism	8.27	11.95	$t(31) = 1.33$	P = 11 NP = 22

Note: P = Psychopath, NP = Nonpsychopath.

Overall, PCL-R scores were typically positively correlated with amount of criminal activity and negatively correlated with time to first criminal activity. However,

there were several positive correlations between PCL-R scores and time to first violent institutional misconduct. The expected pattern reasserted itself when individuals were released to the street: psychopaths typically had more offences and recidivated earlier than nonpsychopaths.

Appendix G

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VRS Stages Comparison Analyses

Part 1: VRS Stages, Demographics, and Socially Desirable Responding

Two-tailed Spearman's correlations were used to test expectations about some of the demographic information. Individuals' VRS stages correlated significantly with age at pre- and post-treatment (pre-treatment $r_s = .17$, $p = .021$, $n = 197$; post-treatment $r_s = .19$, $p = .009$, $n = 197$). There was no significant relationship between pre-treatment VRS stage and education ($r_s = .09$, $p = .239$, $n = 182$) or post-treatment VRS stage and education ($r_s = .14$, $p = .063$, $n = 182$).

Chi-square analyses were used for the remainder of the expectations about demographic information. There were no significant pre-treatment relationships between VRS stage and marital status (χ^2 [3, $n = 195$] = 5.6, $p = .133$), occupation (χ^2 [9, $n = 169$] = 10.3, $p = .328$), or ethnic background (χ^2 [6, $n = 196$] = 12.3, $p = .056$). At post-treatment, there were no significant relationships between post-treatment VRS stages and marital status (χ^2 [3, $n = 195$] = 1.7, $p = .642$), ethnic background (χ^2 [6, $n = 196$] = 7.3, $p = .299$), or occupation (χ^2 [9, $n = 169$] = 2.9, $p = .970$).

For the demographic information, the VRS stages correlated significantly with age (at pre- and post-treatment). All other correlations and chi-squares were nonsignificant.

One-tailed correlational analyses were used to explore the relationship between VRS stages and the PDS. There was no significant negative correlation between SDE scores and either pre-treatment VRS stage ($r_s = -.00$, $p = .486$, $n = 149$) or post-treatment VRS stage ($r_s = .18$, $p = .033$, $n = 103$). IM scores did not correlate significantly in a

negative direction with either pre-treatment VRS stage (r_s = .05, p = .293, n = 149) or post-treatment VRS stage (r_s = .17, p = .045, n = 103).

Part 3: Relationships Between Cluster Profile Rankings and Self- and Staff-report Treatment Process Variables, Risk Variables, and Outcome Variables

Section I: VRS Stages and Self-report Measures

One-tailed correlational analyses were used to test the relationship between the VRS stages and the STAXI. Most of these correlations (except for Anger Control subscale) were negative (see Table G1).

Table G1

STAXI and VRS Stages at Pre- and Post-treatment

	Pre-treatment VRS Stage	Post-treatment VRS Stage
State Anger	-.11	-.18*
Trait Anger	-.07	-.14*
Anger-in	-.16	-.15*
Anger-out	-.14	-.03
Anger Control	.11	.06
n	191	133

* $p < .05$.

One-tailed correlational analyses were used to test the relationship between RPI scores and VRS stages. After controlling for IQ, a significant positive relationship was found between VRS stage and pre-treatment RPI scores (r_s = .19, p = .013, n = 136). At post-treatment a significant positive correlation was found (r_s = .19, p = .036, n = 91).

One-tailed correlational analyses were used to test the relationship between the CSS-M and VRS stages. CSS-M total score, attitudes toward police, and TLV correlated significantly in a negative direction with pre-treatment VRS stage, and the ICO subscale correlated significantly at post-treatment (see Table G2).

Table G2

CSS-M and VRS Stage

	Pre-treatment VRS Stage	Post-treatment VRS Stage
CSS-M Total	-.15*	-.13
Law	-.11	-.07
Court	-.05	-.07
Police	-.21***	-.14
TLV	-.17**	-.08
ICO	-.11	-.19*
n	193	133

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

Chi-square analyses were used to test the relationship between reason for discharge and VRS stage membership. There were no significant pre-treatment relationships (χ^2 [9, n = 195] = 6.5, p = .69). However, at post-treatment, there was a significant chi-square result between VRS stage and discharge reason (χ^2 [9, n = 195] = 57.3, p = .0001; see Table G3).

Table G3

Post-treatment VRS Stages and Reasons for discharge

	Post-treatment VRS Stages					
	Precontemplation	Contemplation	Preparation	Action	Maintenance	Total
Patient requested	3 (23%)	9 (69%)	1 (8%)	0 (0%)	0 (0%)	13
Treatment completed	6 (4%)	29 (19%)	107 (70%)	11 (7%)	0 (0%)	153
Parole	0 (0%)	1 (50%)	1 (50%)	0 (0%)	0 (0%)	2
Removed from treatment	7 (26%)	15 (56%)	5 (19%)	0 (0%)	0 (0%)	27

Section II: VRS Stages and the Group Behaviour Checklist

A linear regression was computed in order to determine whether individuals from more advanced VRS stages received higher GBC scores throughout treatment. Individuals were grouped into "more advanced" or "less advanced" stage groups at pre- and post-treatment. The Preparation, Action, and Maintenance stages were grouped together as more advanced, while Precontemplation and Contemplation stages were grouped together as less advanced at both pre- and post-treatment. Given the "spike" in GBC scores at week 15 (see Figure 11), linear regressions were computed for 21 weeks of treatment and 15 weeks of treatment using the more and less advanced groups for both pre- and post-treatment VRS stages. As can be seen in Table G4, the strength of the linear regression increased for all individuals when only the first 15 weeks of treatment were included in the analyses, however the increase was noticeably greater for individuals in the less advanced VRS stages. It appeared that individuals in more

advanced VRS stages continued to improve throughout the entire 21 weeks of treatment while individuals in the less advanced VRS stages stopped improving with six weeks of treatment remaining.

Table G4

Linear Regression for More and Less Advanced VRS Stages and Week of Treatment

	Pre-treatment More Advanced VRS Stages		Pre-treatment Less Advanced VRS Stages		Post-treatment More Advanced VRS Stages		Post-treatment Less Advanced VRS Stages	
	21 Weeks	15 Weeks	21 Weeks	15 Weeks	21 Weeks	15 Weeks	21 Weeks	15 Weeks
R	.70	.79	.68	.78	.73	.79	.57	.75
p	.00	.00	.00	.00	.00	.00	.01	.00
R^2	.48	.62	.46	.61	.53	.63	.32	.56
Adjusted R^2	.46	.59	.43	.58	.50	.60	.29	.52

Section III: VRS Stages and Measures of Risk

In the third section of Part 3, the VRS stages were examined in terms of their relationships to risk-related measures. One-tailed correlational analyses were used to test the relationships between the VRS stages and the PCL-R, SRS, and VRS.

Pre-treatment VRS stages correlated significantly in a negative direction with PCL-R total scores (r_s = -.35, p = .00, n = 197), Factor 1 scores (r_s = -.28, p = .00, n = 197), and Factor 2 scores (r_s = -.27, p = .00, n = 197). For post-treatment VRS stages there were significant negative correlations with PCL-R total scores (r_s = -.43, p = .00, n = 197), Factor 1 scores (r_s = -.33, p = .00, n = 197), and Factor 2 scores (r_s = -.37, p = 00, n = 197).

Pre-treatment VRS stage did not correlate significantly with pre-treatment SRS scores (r_s = -.13, p = .08, n = 128), but a significant negative correlation was found between pre-treatment VRS Stage and SRS security category (r_s = -.13, p = .04, n = 182). Significant negative correlations were found at post-treatment between VRS stage and SRS scores (r_s = -.42, p = .00, n = 143), and SRS security category (r_s = -.36, p = .00, n = 168).

Significant negative correlations were found between pre-treatment VRS stages and pre-treatment VRS total scores (r_s = -.33, p = .00, n = 197), pre-treatment VRS dynamic scores (r_s = -.26, p = .00, n = 197), and pre-treatment VRS static scores (r_s = -.15, p = .02, n = 197). There was a significant positive correlation between the VRS stages and the change in VRS score from pre- to post-treatment (r_s = .15, p = .00, n =197). Post-treatment VRS stages were correlated significantly in a negative direction with post-treatment total scores (r_s = -.58, p = .00, n = 197), dynamic scores (r_s = -.58, p = .00, n = 197), and static scores (r_s = -.27, p = .00, n = 197). There was a significant positive correlation between the post-treatment VRS stages and the change in VRS score from pre- to post-treatment (r_s = .65, p = .00, n =197).

Section IV: VRS Stages and Criminal Behaviour

In the final section of Part 3, the relationships between the VRS stages and criminal behaviour were explored. One-tailed correlational analyses were used to determine the relationship between the pre- and post-treatment VRS stages and institutional misconduct after leaving RPC. There were significant correlations with amount of non-violent misconduct at pre- and post-treatment. All correlations were in the negative direction (see Table G5).

Table G5

Relationship between Pre- and Post-treatment VRS Stages and Amount of Post-RPC Institutional Misconduct (Controlling for VRS Total Score)

	Pre-treatment VRS Stages	*n*	Post-treatment VRS Stages	*n*
Non-violent Misconduct	-.15*	189	-.12*	189
Violent Misconduct	-.11	189	-.07	189

* $p < .05$.

One-tailed correlational analyses were used to determine the relationship between the pre- and post-treatment VRS stages and time to first institutional misconduct following treatment at RPC. There were no significant findings (see Table G6).

Table G6

Relationship between Pre- and Post-treatment VRS Stages and Number of Months to First Post-RPC Institutional Misconduct (Controlling for VRS Total Score)

Time to:	Pre-treatment VRS Stages	*n*	Post-treatment VRS Stages	*n*
1st Non-violent Misconduct	-.05	119	.08	119
1st Violent Misconduct	-.10	26	-.08	26

One-tailed correlational analyses were used to determine the relationship between the pre- and post-treatment VRS stages and CPIC offences that occurred following release from prison. Individuals were included in this analysis if they were released to the community for at least nine months following treatment at RPC. There was a significant negative correlation with amount of recidivism and pre-treatment VRS stages

(r_s = -.30, p = .02, n = 47). At post-treatment there were no significant findings (r_s = -.10, p = .26, n = 47).

One-tailed correlational analyses were used to determine the relationship between the pre- and post-treatment VRS stages and time to earliest CPIC offences. Individuals were included in this analysis if they were released to the community for at least nine months following treatment at RPC and they were either reconvicted or recharged. Neither correlation was significant (pre-treatment: r_s = .12, p = .26, n = 30; post-treatment: r_s = -.19, p = .15, n = 30).

There was a consistent negative relationship between VRS stages and amount of institutional misconduct and community recidivism, although the correlations were not always significant. There were no significant results between time to criminal behaviour and VRS stages and four of the six correlations were not in the expected direction.

Part 4: Comparison of the Cluster Profiles and VRS Stages

In Part 4 of the study, individuals were placed into discrete stages of change using the VRS (for both pre- and post-treatment). The relevant analyses conducted with cluster profiles in Parts 1 and 3 were repeated for the VRS stages. It was expected that the VRS stages would have significantly greater correlations with these other variables than did the cluster profile rankings. The nonsignificant test results are presented in Table G7 (pre-treatment) and Table G8 (post-treatment).

Table G7

Nonsignificant Comparison of Pre-treatment Cluster Profiles and Pre-treatment VRS Stages on Pre-treatment Variables

	Cluster	VRS	*n*	Hotelling's T
RPI	.23	.25	148	-.22
CSS-M Total	-.20	-.16	191	-.53
Court	-.15	-.06	191	-1.01
Police	-.15	-.21	191	-.72
TLV	-.24	-.17	191	-.77
ICO	-.20	-.10	191	-.11
SRS Category	-.03	-.13	176	1.02
Non-violent Institutional Misconduct	-.02	-.14	183	1.34
Community Recidivism	-.11	-.27	29	.85

Table G8

Nonsignificant Comparison of Post-treatment Cluster Profiles and Post-treatment VRS Stages on Post-treatment Variables

	URICA	VRS	*n*	Hotelling's T
State Anger	-.10	-.18	128	.62
Trait Anger	-.06	-.17	128	.92
Anger-in	-.26	-.16	128	-.85
Anger Control	.19	.08	128	.22
CSS-M Total	-.23	-.13	128	-.82
Court	-.21	-.07	128	-1.21
Police	-.21	-.15	128	-.56
TLV	-.22	-.06	128	-1.26
ICO	-.14	-.18	128	.34
SRS Score	-.07	-.26	96	1.44
SRS Category	-.16	-.13	109	-.28
Violent Institutional Misconduct	-.27	-.14	120	-.99
Non-violent Institutional Misconduct	-.02	-.04	120	.16

Appendix H

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Correlations Between Outcome Behaviours and other Treatment Variables

	Nonviolent Institutional Misconduct	Violent Institutional Misconduct	Community Recidivism
Pre-treatment			
State Anger	.33**** (187)	.36**** (187)	-.09 (49)
Trait Anger	.06 (187)	.02 (187)	-.15 (49)
Anger-in	.01 (187)	-.00 (187)	-.16 (49)
Anger-out	.08 (187)	.07 (187)	-.11 (49)
Anger Control	-.09 (187)	-.04 (187)	-.09 (49)
CSS-M Total	.10 (189)	.11 (189)	-.05 (50)
Law	.09 (189)	.11 (189)	-.04 (50)
Court	.12* (189)	.12 (189)	-.04 (50)
Police	.06 (189)	.08 (189)	-.07 (50)
TLV	.10 (189)	.10 (189)	-.05 (50)
ICO	.01 (189)	.01 (189)	.01 (50)
VRS	.11 (193)	.07 (193)	.29* (50)
PCL-R	.14* (193)	.09 (193)	.37*** (50)
SRS Score	.16* (123)	.19* (123)	.29 (19)
SRS Category	.20*** (178)	.17** (178)	.03 (42)
Post-treatment			
State Anger	.07 (129)	.09 (129)	-.18 (23)
Trait Anger	.10 (129)	.05 (129)	-.18 (23)
Anger-in	.09 (129)	.10 (129)	-.10 (23)
Anger-out	.08 (129)	.04 (129)	.12 (23)
Anger Control	-.17* (129)	-.02 (129)	.29 (23)
CSS-M	-.09 (129)	.03 (129)	-.17 (24)

Total			
Law	-.11 (129)	-.03 (129)	-.17 (24)
Court	-.08 (129)	.08 (129)	-.19 (24)
Police	-.06 (129)	-.01 (129)	-.09 (24)
TLV	-.06 (129)	.03 (129)	-.21 (24)
ICO	-.05 (129)	.02 (129)	.16 (24)
VRS	.16** (193)	.10 (193)	.33** (50)
PCL-R	.14* (193)	.09 (193)	.37*** (50)
SRS Score	.24*** (141)	.18* (141)	.45** (25)
SRS Category	.26**** (166)	.19** (166)	.33* (37)

Note: Numbers in parenthesis represent sample size.

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.