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A brief motivational interviewing intervention with prisoners: when you lead a horse to water, can it drink for itself?

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Offenders' readiness to engage in changes that will reduce their risk of reoffending is now recognized to be as important as the design and delivery of programmes that support such change. Interest is growing in both how to increase engagement in change processes, and how to measure any improvements in engagement. This study evaluated the effects of a brief offending-focused motivational interviewing (MI) intervention on reconviction in male prisoners serving sentences for diverse crimes. Men who undertook MI were significantly less likely to be reconvicted than those who did not. The results also served to validate a stage-based measure of readiness to change derived from Prochaska and DiClemente's Transtheoretical Model. Prisoners who were offered MI increased their readiness to change by an average of one stage, while the scores of men who were not remained unchanged. Furthermore – whether men undertook MI or not – change in stage of change predicted reconviction. This was a high-risk sample, making the results intriguing for at least two reasons. First, reductions in recidivism are usually achieved only with much more intensive programmes for high-risk men. Second, according to 'traditional' cognitive–behavioural rehabilitation theory, programmes need to target change in dynamic risk factors directly to reduce reconviction risk. That these results were obtained with men whose initial motivation was low, and in the absence of any 'traditional' criminogenic rehabilitation, raises questions about whether there is more than one mechanism involved in desistance.

Keywords: motivational interviewing; Transtheoretical Model; stages of change; motivation; prisoner rehabilitation; criminogenic programmes

Introduction

'You can lead a horse to water, but you can't make it drink'. For psychologists engaged in interventions designed to reduce criminal recidivism risk, this well-known proverb aptly characterizes a pressing challenge; how best to work effectively with offenders who – despite myriad crime-related risk factors and lifestyle difficulties – may be reluctant to acknowledge the criminogenic influences in their lives, feel unequal to the demands of actively managing a prosocial lifestyle, or even insist they enjoy a criminogenic lifestyle?

Empirical evidence has identified a number of factors that, when brought together in a rehabilitative programme, can reduce the likelihood of recidivism for

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participating offenders (Lipsey & Cullen, 2007; McGuire, Bilby, Hatcher, Hounsome, & Palmer, 2008; Wilson, Bouffard, & MacKenzie, 2005). The 'short-hand' for these necessary factors has come to be called the Risk–Need–Responsivity (RNR) model of rehabilitation (Andrews & Bonta, 2006).

Responsivity refers to whether offender characteristics and programme character-istics mesh to enhance offender programme engagement and change. Seen as a responsivity factor, lack of motivation to change behaviour is widely regarded as a primary obstacle in rehabilitating offenders (Ward, Day, Howells, & Birgden, 2004). In some jurisdictions scarce programming resources made it easy in the past simply to offer treatment only to offenders who professed to be motivated. However, especially with higher risk offenders (e.g. persistent violent offenders, psychopaths) it is becoming increasingly evident that low motivation to address offending risk is the norm (Polaschek, Anstiss, & Wilson, 2010; Polaschek, 2007; Wong & Gordon, 2006), and that our obligations to society require us to turn more of our attention to motivating the unmotivated. There has been an upsurge in measurement of, and interventions focusing on motivation, readiness to change (McMurran, 2009), and on the related construct of treatment readiness (Casey, Day, Howells, & Ward, 2007). However, relationships between these concepts remain to be clarified. For example, is motivation to avoid reoffending a necessary but not sufficient condition for treatment readiness?

Processes of change – both spontaneous desistance (Maruna, 2001; Walters, 2002) and change associated with participation in rehabilitative programmes (Day, Bryan, Davey, & Casey, 2006) – remain poorly understood and measured. Prochaska's Transtheoretical Model of Change (TTM; e.g. Prochaska, DiClemente, & Norcross, 1992) provides one way of understanding behaviour change processes by describing the stages of change people are hypothesized to progress through as they attempt to resolve their problems. The TTM was developed with – and has been applied primarily to – the treatment of addictive behaviours. It also is the most common model used with offenders (Day et al., 2006).

The TTM and motivational interviewing

The TTM is important in this study because the main variable used to measure intervention progress is based on its stages of change. The TTM proposes that people pass through five identifiable, qualitatively distinct stages of change as they move to problem resolution: Precontemplation, Contemplation, Preparation, Action, and Maintenance (Prochaska & DiClemente, 1994). People in the *Precontemplation* stage do not acknowledge a problem or that they should work on it. Those in the *Contemplation* stage are aware of their problems and considering the possibility of change. In the *Preparation* stage people make a commitment to change and may take preliminary steps in the new direction. In the *Action* stage, they are taking appropriate action to address the problem behaviour (e.g. participation in appro-priate treatment, practising alternative behaviours). Finally, those in the *Main-tenance* stage are consolidating change and working to prevent a return to previous behaviour.

Although the TTM is the most commonly used model of change for criminal behaviour, research findings have been equivocal, and there is concern about both accurate measurement of the stages of change (Polaschek et al., 2010; Belding,

Iguchi, & Lamb, 1996; Tierney & McCabe, 2004), and the underlying TTM theory when applied to offending (Casey, Day, & Howells, 2005).

The TTM developed separately from the most commonly used intervention for motivating offenders (McMurran, 2009), the motivational interviewing (MI) approach (Miller & Rollnick, 1991, 2002). However, it easy to see why the two are often linked: MI offers a raft of strategies for approaching resistance and ambivalence that is naturally suited to working with those who are not yet actively involved in behavioural change (DiClemente & Velasquez, 2002).

When conceptualized as a stand-alone intervention, MI is a brief programme directed specifically at improving people's interest in reducing a problem behaviour, and in doing the necessary work to ameliorate it (Miller & Rollnick, 2002). Therapists work persuasively and supportively with clients, using various specific techniques to achieve intervention objectives. Five basic principles underlie the approach: (a) developing discrepancy, (b) avoiding arguing, (c) rolling with resistance, (d) expressing empathy, and (e) supporting self-efficacy. The objectives are to increase problem acceptance and recognition, address ambivalence, highlight benefits of change, and help the client reach a robust decision to work towards changing behaviour, where there was no such commitment at the outset (Miller & Rollnick). Even though these objectives seem most closely associated with the early TTM stages of change, MI has been found to be effective later in treatment too (Wilson & Schlam, 2004).

Miller and Rollnick (2002) outlined both standalone and pre-intervention (i.e. where MI precedes convention action-oriented therapies) applications of MI. Evaluations with non-offenders have found MI alone to be as effective as programmes based on active change processes (e.g. cognitive–behavioural therapy targeting the problem behaviour itself; see Burke, Arkowitz, & Menchola, 2003). However, in offender rehabilitation, MI is primarily discussed as a pre-programme responsivity intervention (McMurran, 2009; Ward et al., 2004). The dominance of Andrews and Bonta's (2006) theory of criminal behaviour change suggests that responsivity is a necessary but not sufficient to reduce recidivism risk. On its own, strong motivation to avoid reoffending – regarded by Andrews and Bonta as a component of responsivity – is not viewed as likely to change directly dynamic risk factors (see also Andrews, 2006; Day et al., 2009; Mann, Ginsberg, & Weekes, 2002). This is intuitively a plausible view: correctional therapists commonly encounter offenders who profess to be motivated to avoid reoffending, yet all-too-often return to prison rapidly following release.

The MI ethos and techniques have been adopted widely in Western jurisdictions conducting offender rehabilitation, including the UK, the USA (McMurran, 2009) and New Zealand. But few studies have yet examined its efficacy either in achieving intermediate change (e.g. increased referral to, and participation in criminogenic programmes) or reducing recidivism. McMurran recently reviewed the literature on the use of MI, and Motivational Enhancement Training (a variant of MI; Viets, Walker, & Miller, 2002). Her careful examination of the published and unpublished literatures uncovered 18 studies in addition to the research reported here. Of these 18, 11 focused exclusively on substance use. Of the seven remaining studies, two used MI with family violence, and the other five with alcohol-impaired driving. This article thus may be the first to report on the use

if MI to reduce criminal behaviour in a sample of male prisoners with diverse index offences and criminal histories.

Research design, context and objectives

New Zealand has a single prison system, currently managing about 8000 prisoners. Sentence planners assess all prisoners beginning sentences longer than six months. Assessment results determine whether they are referred to a prison-based criminogenic rehabilitation programme. Programme referral is determined by complex operational policies that target more intensive interventions to higher risk offenders and match specific interventions to identified criminogenic needs and offence types. Thus the nature of their index offence, level of criminal risk, programme availability, and willingness to attend all determine whether a prisoner is referred to or eventually attends a programme. Prisoners are reassessed every six months. So if they meet all other criteria, changes in readiness evident at these later assessments can trigger referral to a criminogenic programme not scheduled in their original sentence plan. Programme attendance usually occurs towards the end of their sentence. Operational factors (e.g. lack of programme availability, human error) can result in programme non-referral or non-attendance even when the offender has been identified as suitable.

This study reports on a brief pilot MI intervention with a mixed sample of prisoners referred by prison sentence planners. The study was quasi-experimental: Men who took part in the MI intervention were matched with a group of men for whom it was not available. Both samples were subject to routine sentence management procedures: sentence planners assessed them at the beginning of their sentence, and at 6-monthly intervals thereafter. Men referred to the MI intervention completed it prior to the first reassessment. Some men in each sample later attended a criminogenic programme, creating a four-group design: (a) MI alone, (b) MI and criminogenic programme, (c) no MI and no criminogenic programme, and (d) criminogenic programme alone.

Our first aim was to examine whether MI was effective in reducing recidivism. Relatedly, we sought to test the effectiveness of the stand-alone MI model compared with the pre-intervention MI model, by comparing outcomes for men who attended MI and went on to complete a criminogenic programme, with those who attended only MI.

The third objective was to examine the validity of the TTM-based readiness-to-change measure. Although previously validated as a measure of stage of change, its effectiveness as an index of the effects of intervention has not been established. Would offenders attending the MI intervention show larger changes in their average stage of change than men who did not? Would changes predict outcome?

Method

Participants

Motivational interviewing intervention sample

Participants in the MI intervention were 58 men commencing imprisonment sentences for diverse crimes, including violence, sexual, property, drug, and driving

offences, with sentences longer than six months. Participants' ages ranged from 22 to 64 years ($M = 34.3$, SD $= 9.0$). There were 32 Maori men, seven from Pacific Islands, and 19 were NZ European or other ethnicities.[1] Participants were offered no incentives for participation.

Treatment-as-usual sample

For each MI participant, a matched prisoner was selected from the electronic database of all current male prisoners starting a sentence of more than six months. These 58 matched prisoners are referred to as the treatment-as-usual (TAU) sample; they were subject to routine sentence management and were released during the same time period as the MI participants. Matches were selected based on criteria empirically related to reconviction (Bakker, O'Malley, & Riley; Hanson & Bussiere, 1998): same sex, same ethnicity, and a close match on age, and on actuarially estimated risk of reconviction (RoC*RoI score, described below). When multiple TAU matches were available, the one with the closest prison release date to the MI participant was selected.

Table 1 shows the mean scores for the two continuous matching variables, and for two other variables described below, on which Time 1 (pre-intervention) equivalence also was desirable: each offender's assessed number of criminogenic needs, and their Time 1 stage of change scores. A MANOVA with these four variables found no significant differences between groups: $F(4,111) = 0.99$, $p = 0.88$.

Measures

Criminogenic Needs Inventory stage of change assessment

The Criminogenic Needs Inventory (CNI) (Coebergh, Bakker, Anstiss, Maynard, & Percy, 1999) is a structured cognitive–behavioural protocol routinely used by sentence planners to assess (a) for the presence of 15 dynamic risk factors, or criminogenic needs (Andrews & Bonta, 2006), including alcohol and drug use, propensity for violence, deviant sexual arousal, and antisocial thinking; and (b) the offender's current stage of change for each identified need. The CNI was New Zealand-designed for use by assessors who lack extensive social service training. To ensure reliable and valid administration, the tool is highly prescriptive, and assessors undergo rigorous training, use detailed administration manuals, and are provided

Table 1. Matching variables: MI and TAU samples.

	Mean (SD)	
	MI ($n = 58$)	TAU ($n = 58$)
Age	34.3 (9.1)	34.4 (9.0)
RoC*RoI (criminal risk estimate)	0.59 (0.27)	0.58 (0.27)
No. of criminogenic needs	3.7 (1.0)	3.6 (0.8)
Time 1 CNI-RTC (stage of change) score[a]	1.4 (0.5)	1.4 (0.6)

[a]1, Precontemplation; 2, Contemplation; 3, Action; 4, Maintenance (see main text).

with ongoing professional supervision. When administering the CNI, they conduct a structured interview with each offender based around the index offence, and use the information to identify which of the 15 possible criminogenic needs are present. For each relevant criminogenic need, a current stage of change is established using a structured algorithm that maps closely onto accepted definitions of stages of change based on the Transtheoretical Model of Change (TTM), developed by Prochaska, DiClemente and colleagues (e.g. Prochaska, DiClemente, & Norcross, 1992).

Figure 1 summarizes the CNI algorithm. The CNI avoids the use of an arbitrary time-period to indicate stage progression: a criticism of some methods (Bandura, 1998; Sutton, 2001). Instead it focuses both on expressed intention and observable behaviour as evidence of stage progression. For stages above Precontemplation, the assessor looks for both negative (e.g. excitement about offending, aggressive with interviewer, poor compliance with sentencing requirements) and positive (e.g. identifies specific positive benefits associated with change for self and others, good attendance at appointments, appears open and cooperative in interview, shows no ambivalence re change, evidences no cognitive distortions re offending) evidence, based both on the assessor's observations and the file information (Coebergh et al., 1999).

Application of the CNI algorithm yields a single stage of change for each identified criminogenic need: a number between 1 and 4 (Precontemplation = 1,
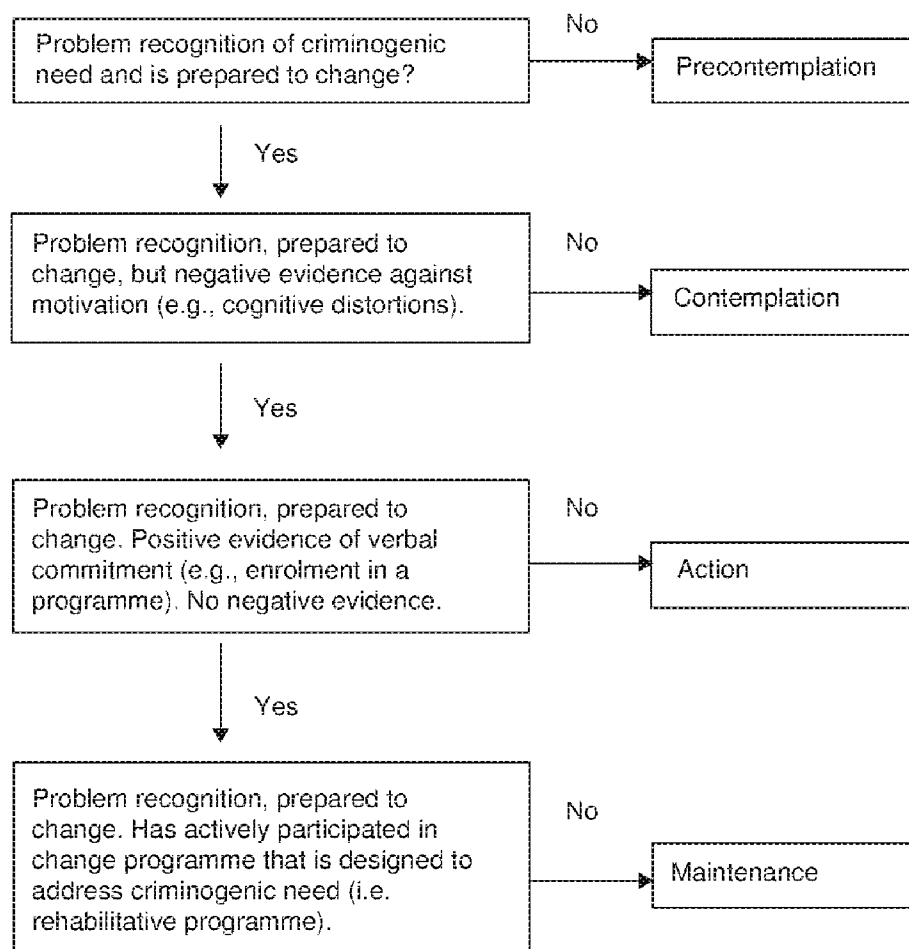

Figure 1. CNI motivational algorithm.

Contemplation = 2, Action = 3, Maintenance = 4). These numbers are summed and divided by the number of criminogenic needs, giving an average stage of change for each offender: the CNI-RTC score. The CNI stage of change assessment is dynamic: it can be repeated throughout an offender's sentence to document progress or retrenchment on criminogenic needs. Coebergh et al. (1999) reported both good test–retest reliability (over four weeks) and interrater reliability with a sample of 71 offenders. A recent study with a larger New Zealand prison sample also found preliminary support for the validity of the algorithm as a method of assessing offending-related stage of change in men (Polaschek et al., 2010).

RoC*RoI

The RoC*RoI (Bakker et al., 1999) is the New Zealand Department of Corrections' tool for actuarial risk assessment, developed and cross-validated on two samples, each of 24 000 offenders. Expressed as a probability, it is an offender's estimated risk of reconviction leading to re-imprisonment over the following five years. Therefore RoC*RoI scores can range from 0 to 1 and provide an estimate of *serious reconviction risk*. The RoC*RoI score is generated by computer algorithm, based largely on criminal history variables and is therefore a static risk estimate. It requires no clinical judgment or manual decision-making, and can be updated at any time, although it changes very slowly. During development, the RoC*RoI demonstrated high predictive validity – an AUC of 0.76 (Bakker, O'Malley, & Riley, 1998) – and recent analyses confirm its predictive validity over three years post-release (Nadesu, 2007).

Recidivism data

Recidivism was defined as a conviction for any post-release criminal offence aside from parole revocation offences related to the original index imprisonment offence (e.g. breach of parole). When a re-conviction resulted in a sentence of imprisonment it also was recorded as 're-imprisonment'. The re-conviction and re-imprisonment records of all participants were extracted from the national convictions database in March 2005. Time at liberty was calculated from the date of the offender's release from prison until either the actual reoffence date or the data extraction date if there was no reconviction. For the combined sample, the time at liberty ranged from one day to 1092 days (three years and 10 months), with a mean of 445 days (SD = 335).

Procedures

At the beginning of each participant's prison sentence, sentence planners conducted a routine initial assessment that identified the offender's criminogenic needs and stage of change on each need, and resulted in an individualized sentence plan that includes recommendations about which rehabilitative programme the offender should be scheduled to attend during the prison sentence.

We calculated the Time 1 CNI-RTC score from computerized records of this routine assessment. For the MI participants, the MI intervention followed the Time 1 assessment by no more than four weeks, and the Time 2 CNI-RTC score was derived from a sentence planner's reassessment completed after the intervention. Standard prison procedures require that men be reassessed six-monthly or following

a significant event (e.g. following a parole hearing, or completion of a rehabilitative programme), so the Time 2 CNI-RTC for the TAU group came from this routine reassessment.

For the MI sample, the mean time interval between initial motivational assessment and re-assessment was nine weeks (SD = 1.7). For the TAU sample, the time interval between pre and post assessments was more variable for the reasons noted above: mean = 17 weeks (SD = 5.5). This difference was significant: $t(114) = 100.5$, $p < 0.001$.

Recruitment and processing of participants for the MI intervention

Over the two-year term of this study, the first author informed sentence-planning staff that a pilot MI intervention was available to prisoners, and that they could refer any prisoner that they thought could benefit from the brief intervention regardless of his current readiness to change. Sentence planners were not aware of the offender's overall Time 1 CNI-RTC score, only of the stage of change label for each identified criminogenic need. We anticipated that offenders with a range of stage of change scores would be referred. Once referred, each offender met individually with the first author, who outlined the research. Prisoners were informed that they were being invited to take part in a pilot intervention, that the information they provided during the MI intervention was confidential, and that they could decline to participate without any consequences. Six referred offenders declined to participate; no further record of their involvement was made. Of the 59 offenders who consented, one subsequently withdrew consent prior to the first MI session, and was excluded from data collection. The MI group therefore comprised 58 offenders. The sentence planning team was notified as each participant completed the MI intervention. To ensure that the CNI-RTC ratings were as independent as possible from the MI therapist's appraisals, no further information about the participant's progress was given to the sentence planning team by the therapist. A member of this team then re-administered the CNI stage of change assessment, providing the data on which we calculated the Time 2 CNI-RTC, and the difference between the Time 1 and Time 2 scores.

Treatments/Interventions

Motivational Interviewing programme development

A brief structured MI programme was developed based on the principles outlined by Miller and Rollnick (1991, 1995, 2002) and Mann et al. (2002). Both the intervention content and therapist style were designed to promote movement along the stages of change continuum by using the persuasive and supportive therapeutic techniques on which MI is based. The programme aimed to improve offenders' willingness to address their criminogenic needs and to increase the likelihood of subsequent participation in action-oriented intervention programmes (e.g. specific offending-related rehabilitative programmes). The programme was not matched to participant stage of change: all participants completed all sections.[2] Each of four structured programme sessions was directed towards one practical task with a predefined

learning objective (see Table 2; DiClemente & Velasquez, 2002; Prochaska & Levesque, 2002).

The therapist for all MI intervention sessions (the first author) was experienced with the rehabilitation of offenders, and underwent specific training in MI prior to the commencement of the intervention. Following the assessment of programme quality (see below), the quality assessor also provided regular supervision to ensure ongoing programme integrity. The programme was delivered to prisoners individually in a single one-hour session per week. As noted, all participants completed all of the material in the intervention manual within three to five sessions (median =4); the pace was varied to accommodate participant variations in responsivity.

Independent evaluation of programme quality

To ensure treatment integrity a programme manual was developed and used for all sessions with all participants. The manual provided detailed guidance on both the intervention process and content, and included standardized handouts for participants. A doctoral-qualified Department of Corrections clinical psychologist administered the Correctional Program Assessment Inventory (CPAI: Gendreau & Andrews, 1996), to provide an independent quantitative assessment of intervention quality. The CPAI measures correctional programmes against principles of effective intervention established from empirical research. It assesses programme characteristics across six domains with weighting scores being used to provide an overall assessment of programme integrity and quality. According to the CPAI norms (Gendreau & Andrews) the MI intervention scored 85%, at the high end of the Very Satisfactory range (70–100%).

Routine rehabilitative programme participation

At some point after the Time 2 assessment, some men in both samples participated in prison based rehabilitative programmes as determined by their individual sentence plan. Information on who had completed these programmes was extracted from the electronic database. Because of the small numbers of participants completing each type of programme, rehabilitative programme participation was abbreviated into a

Table 2. MI intervention session description.

Session	Practical task	Learning objective
1	Review assessment results	Develop problem recognition
2	Complete decision grid	Understand the advantages and disadvantages of continued criminal behaviour
3	Complete psycho-educational exercise on cognitive distortions	Improve understanding and recognition of cognitive distortions that act as barriers to change
4	Complete action plan	Commit to future course of action designed to encourage and maintain positive behavioural change

single dichotomous variable labelled 'criminogenic programme'. Most were 70 hour cognitive–behavioural or psycho-educational interventions. Their design was based on the Risk–Need–Responsivity model (Andrews & Bonta, 2006), and the 'what works' research (e.g. McGuire, 2004).

Results

All data analyses were conducted using the Statistical Package for the Social Sciences software (version 11.0). Planned analyses included (1) chi-square tests and survival analyses to examine the effects of MI on recidivism, (2) mixed ANOVAs for validating the stage of change ratings for MI vs TAU samples, and (3) logistic regressions and Cox's regressions for predicting recidivism outcomes (dichotomous and survival time data) from stage of change and other independent variables.[3]

Effect of MI intervention on recidivism

The first study aim was to examine whether completing a MI intervention was effective in reducing the proportion of men who recidivated compared to TAU offenders, and in delaying time to reconviction.[4] The findings generally are supportive.

Each prisoner's conviction history was examined from the date of release from prison until the date of the first offence that resulted in reconviction or re-imprisonment, or until the cut-off date for data extraction when there was no reconviction. The overall reconviction rate was 57% for MI participants, and 78% for TAU men: a significant difference ($\chi^2(1) = 4.7$, $p < 0.05$). The same comparison for re-imprisonment approached significance; 24% of the MI participants were re-imprisoned, compared to 41% of other men ($\chi^2(1) = 3.2$, $p = 0.08$).

Next, we conducted survival analyses using the Kaplan–Meier Product-Limit method to test for sample differences in survival time. Figure 2 shows the survival curve for the MI and TAU samples for time to re-conviction. Participants who
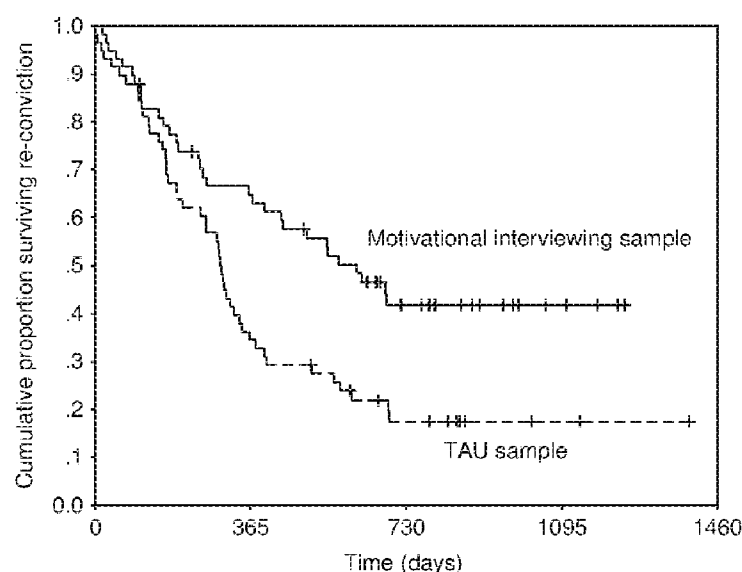

Figure 2.   Cumulative proportion surviving re-conviction for MI and TAU samples.

completed the MI programme on average achieved a longer time to re-conviction than TAU prisoners (693 days vs 464 days). The two trajectories are similarly steep through the first 100 days, but whereas the MI curve gradually flattens out, the TAU sample continues to fail at a rapid rate; the majority of that sample was reconvicted for offences committed within the first year. Consistent with the previous analysis, the log-rank test for time to re-conviction ($\chi^2(1) = 8.2$, $p < 0.005$) indicated that the two survival curves were significantly different.

A similar analysis on time to re-imprisonment produced parallel results: the log-rank test was again significant ($\chi^2(1) = 4.3$, $p < 0.05$), indicating that MI participants were less frequently and more slowly re-imprisoned than the TAU participants. In summary then, these preliminary analyses suggest that MI was surprisingly effective in reducing risk of recidivism. There were substantial differences in recidivism outcome for MI men compared to men who did not undertake the intervention, both for any reconviction, and for reconviction for a serious offence (i.e. imprisonment).

Interactions between the MI intervention and completion of criminogenic programmes

As we noted earlier, prisoners in both the MI sample and the TAU sample could be referred to routinely available criminogenic rehabilitative programmes during their prison sentence, yielding a quasi-experimental design with four conditions: (a) 'MI only' ($n = 26$); 'MI and criminogenic programme' (participants in MI sample who attended a criminogenic programme following the Time 2 CNI-RTC data collection; $n = 32$), 'no programme' (i.e. no MI and no criminogenic programme; $n = 22$), and 'criminogenic programme only' (no MI, attended criminogenic programme after the Time 2 CNI-RTC data collection; $n = 36$). Thus we could examine an important question in the existing literature; whether following MI with a traditional action-oriented criminogenic programme was more effective in reducing recidivism than MI alone.

To test for this additive effect, the recidivism data for the four conditions were subjected to a Kaplan–Meier survival analysis (Figure 3). The overall survival analysis was significant (log rank test statistic $\chi^2(3) = 8.1$, $p < 0.05$). Pairwise comparisons between groups revealed which differences were significant. The no-programme group showed significantly poorer recidivism outcomes than both the MI-only group ($\chi^2(1) = 4.9$, $p < 0.05$) and the combined programme group ($\chi^2(1) = 3.9$, $p < 0.05$). However, there was no difference between the no-programme group ($n = 22$) and the criminogenic programme group ($n = 36$), suggesting that criminogenic programmes had no overall impact on subsequent recidivism. The difference between the MI only ($n = 26$) and criminogenic programme-only group approached significance; $\chi^2(1) = 3.5$, $p = 0.06$. The difference was not significant between the MI only group and the group that received MI and went on to attend a criminogenic programme ($n = 32$). Repeating this analysis with the dependent variable of time to re-imprisonment produced a similar pattern of results. In summary, there was no evidence that attending a criminogenic programme following MI intervention was more effective in reducing recidivism, compared to MI alone. However, there also was no evidence that criminogenic programme attendance alone was effective in reducing recidivism.
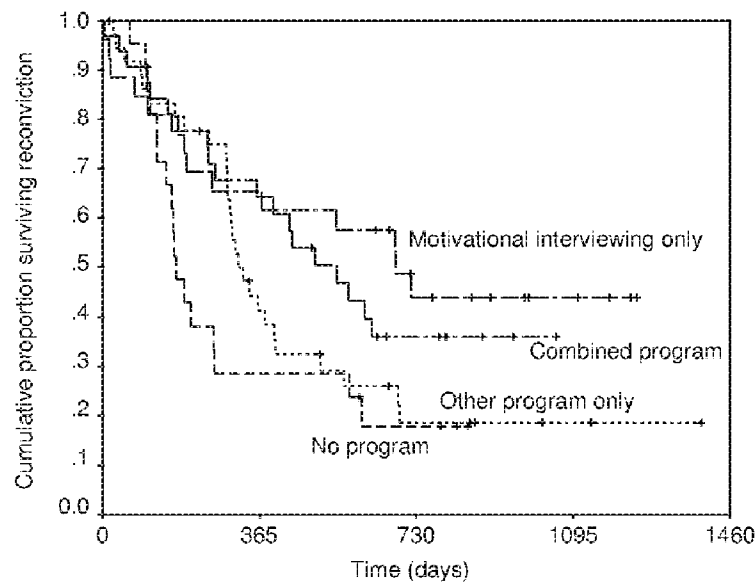
Figure 3.   Cumulative proportion surviving re-conviction for four groups: MI programme only; other (i.e. criminogenic) programme only; combined programme (MI and criminogenic programme); and no programme.

Validation of stage of change ratings

Next, we turn to the stage of change measure: the CNI-RTC. The analyses that follow examine three variables derived from its use: Time 1 CNI-RTC scores, Time 2 CNI-RTC scores, and CNI-RTC difference scores, calculated by subtracting Time 2 scores from those at Time 1.

Table 1 shows that mean Time 1 CNI-RTC scores were identical for MI and TAU groups. Time 2 CNI-RTC data were missing for 25 of the 58 case-matched TAU men. To examine whether men who took part in the MI intervention progressed through more stages of change than TAU men, a mixed between-within-subjects ANOVA was conducted with the remaining men. Significant main effects were found for time: Time 1 vs Time 2 $F(1,89) = 27.14$, $p < 0.01$, and for sample: MI vs TAU $F(1,89) = 9.78$, $p < 0.01$. There was a significant sample–time interaction effect; $F(1,89) = 32.97$, $p < 0.01$. All effect sizes were large by Cohen's (1988) criteria: η^2s $= 0.23$, 0.23, and 0.27, respectively.

Figure 4 displays these results. The mean motivation score for the MI participants increased from 1.4 (SD $= 0.50$) at Time 1 to 2.4 (SD $= 1.1$) at Time 2. For the TAU participants the mean motivation score was stable: Time 1 $= 1.5$ (SD $= 0.53$),[5] Time 2 $= 1.4$ (SD $= 0.55$). Men who undertook the MI intervention increased their change scores by an average of one stage, while those who did not remained unchanged. In concrete terms, the mean change for MI participants represented a move from the Precontemplation to Contemplation stage, while TAU participants remained midway between Precontemplation and Contemplation.

Prediction of recidivism outcomes using stage of change and other variables

Having established that men attending the MI intervention not only reduced their risk of recidivism compared to the TAU sample, but also significantly increased their
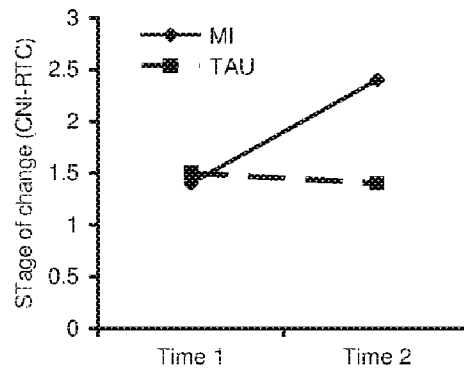
Figure 4. Changes in stage of change over time for MI and TAU samples.

stage of change, the next step was to evaluate the predictive utility of the stage of change variables. To do this, we first examined the relative predictive contributions to recidivism outcome of all of the available variables: age, ethnicity, number of criminogenic needs, participation in criminogenic programmes, RoC*RoI score and the three RTC variables (Time 1 CNI-RTC, Time 2 CNI-RTC, RTC difference score). Because the difference score was calculated from both the Time 1 and Time 2 scores (i.e. to avoid the linearly dependent covariate effect) and for ease of interpretation, each of the RTC variables was entered into its own separate model for all of the analyses that follow.[6]

Three preliminary logistic regression analyses were run with the variables above entered in a single block along with one of the three RTC variables. All three regressions were significant (χ^2s $= 24.1-30.0$, all $ps < 0.001$) with RoC*RoI score a significant predictor in each: Wald statistics ranged from 12.6 to 14.4 (all $ps < 0.001$). In their respective equations, Time 1 stage of change, and the stage of change difference scores each made a significant contribution to their respective models (Wald statistics $= 7.0$, 7.1, respectively, $ps < 0.01$), but Time 2 stage of change did not (Wald statistic $= 2.6$, $p = 0.11$). Ethnicity was a significant predictor in all three (Wald statistics ranged between 4.9 and 5.4, ps between 0.02 and 0.03). No other variables were predictive.

The static risk estimate is easily calculated, with minimal cost and effort, and has established predictive validity. Therefore a key question concerned the ecological validity of the stage of change variables: could they contribute significantly to the prediction of recidivism over and above the static risk estimate (the RoC*RoI). This question was examined using a forward stepwise logistic regression procedure. Again, in three separate analyses, the RoC*RoI was entered into the first block, and in the second block, we, respectively entered the Time 1 stage of change, the Time 2 stage of change, or the stage of change difference score. As expected, the RoC*RoI was significant in all three, accounting for between 14 and 19% of the variance, depending on the model. Time 1 stage of change made a significant incremental contribution to the model ($\chi^2(1) = 7.8$, $p < 0.01$), as did the stage of change difference score: $\chi^2(1) = 10.0$, $p < 0.01$. The Time 2 stage of change score made a marginally significant contribution: $\chi^2(1) = 3.5$, $p < 0.06$. Further regression analyses revealed that the improvement in its predictive strength in this model compared to the previous analysis with all of the predictors was a consequence of the absence of the ethnicity variable from this equation. Separate logistic regression analyses by

ethnicity revealed that for Maori, Time 2 stage of change scores were a significant predictor of reconviction (Wald statistic = 5.0, $p < 0.05$) while for non-Maori, they were not (Wald statistic = 0.03, $p = 0.88$). Neither of the other two stage of change variables was significantly affected by ethnicity.

The respective odds ratios indicate the size of the contribution made by the actuarial risk measure and by the stage of change measures when the contribution of the risk measure is already taken into account. These results provide another confirmation of the power of static risk estimates as predictors of who will recidivate: an increase of 0.1 in the RoC*RoI score increased the likelihood of reconviction by between 22 and 24 times. The comparative contribution of the stage of change scores was smaller. Contrary to expectations, a one-point increase in the Time 1 stage of change score *increased* the likelihood of reconviction by a factor of 4.2. A one-point increase in the post-treatment stage of change score and the stage of change difference score decreased the odds of reconviction by 35%, and 55%, respectively.

Next we carried out a series of Cox's regressions to investigate the prediction of time to reconviction, using the same variables. Age, number of criminogenic needs, criminogenic programme attendance, ethnicity, and RoC*RoI were entered in a single block along with one of the stage of change variables (Time 1, Time 2, difference score). As for the logistic regressions, all three models were statistically significant ($p < 0.001$), and the RoC*RoI was a significant predictor in each model. Time 1 stage of change score was not a significant predictor, regardless of whether ethnicity or other variables were included or excluded from the models.

As before, three additional Cox's regressions were used to investigate whether the three stage of change variables each made a significant contribution to the prediction of time to reconviction, over and above the contribution made by the static risk estimate. The first block of each equation thus contained only the RoC*RoI. When the Time 1 stage of change was added in the second block, there was no significant change in the model: $\chi^2(1) = 2.7, p = 0.1$. In the second equation, entering the Time 2 stage of change into the second block did significantly change the model: $\chi^2(1) = 4.1$, $p < 0.05$. Similarly, adding the stage of change difference scores as the second block in the third equation, produced a statistically significant change in the model; $\chi^2(1) = 9.3, p < 0.01$.

Just as for the prediction of which prisoners were reconvicted, the RoC*RoI odds ratios were larger than for the change variables, though much smaller than for the logistic regression equations: an increase in RoC*RoI of 0.1 increased the speed of reconviction by between 5.3 and 6.8 (i.e. 530 and 680%, respectively). An increase of one stage on the Time 2 stage of change variable uniquely decreased the speed of reconviction by 23%, while an increase of the same magnitude in the amount of change between Time 1 and Time 2 decreased the speed of reconviction by 39%.

To conclude, these analyses demonstrated that with two exceptions, stage of change, and differences in stage of change over time incrementally predicted both the occurrence and speed of reconviction after controlling for criminal risk.

Stage of change and post-MI referral to criminogenic programmes

The process of data collection was designed with the intent of maximizing – within ethical and operational constraints – the independence of the MI intervention from routine sentence-planning processes, including the repeated assessments of stages of

change. There were no motivational criteria for referral to the MI programme, and the MI therapist did not give sentence planners post-intervention feedback on the offender until after the planners had made the Time 2 CNI-RTC ratings. However, especially for offenders who did make progress in the MI intervention, sentence planners should have not only detected improvements in stage of change, but might also schedule for routine criminogenic programmes previously unsuitable offenders who made progress on stage of change. Our final analyses examine the issue of whether the MI intervention made it more likely that planners would subsequently refer men to criminogenic programmes. Information on whether men were scheduled to attend criminogenic programmes at Time 1 or Time 2 was not available. Overall rates of referral showed no evidence that men who attended MI were referred on more frequently: 55% of the MI participants and 62% of the TAU participants attended criminogenic programmes ($\chi^2(1) = 0.56$, NS).

However, Table 3 suggests that although completion of the MI intervention in itself may not have increased rates of referral to criminogenic programmes, post-MI intervention changes may have. To obtain the data in Table 3 we conducted a between-subjects ANOVA on stage of change scores across all four conditions (no programmes, MI only, criminogenic programme only, and MI followed by a criminogenic programme). The results showed no significant differences at Time 1, and significant differences for both Time 2 and difference scores. *Post hoc* tests (Tukey's HSD) showed that men who attended MI followed by a criminogenic programme had significantly higher Time 2 scores, and significantly larger difference scores than all other conditions. No other conditions differed from each other. To summarize, this pattern of results suggests that prisoners who were referred to MI were neither more nor less ready for change than those who were not. However, those who were also referred to a criminogenic programme made an average shift of more than 1.5 stages of change after attending MI. We can thus tentatively infer that MI men who later attended a criminogenic programme were probably referred at or after Time 2, because on average at Time 2 they were almost in the Action stage of change, although they started the MI intervention between Pre-contemplation and Contemplation. Also noteworthy about Table 3 is the stability of the stage of change scores for men who attended no programme or only a criminogenic programme. Both groups had no intervention between Time 1 and Time 2.

Table 3. Stage of change scores and programme status for participants with Time 2 data.

Group	Stage of change score (CNI-RTC)		
	Time 1	Time 2***	Difference*** (Time 2 – Time 1)
No programme ($n = 22$)	1.5	1.35[a]	−0.15[c]
MI only ($n = 26$)	1.37	1.7[a]	0.34[c]
Criminogenic programme only ($n = 36$)	1.43	1.46[a]	0.04[c]
MI and criminogenic programme ($n = 32$)	1.34	2.87[b]	1.53[d]

Means with different superscripts were significantly different in *post hoc* tests.
***$p < 0.001$.

Discussion

Overall, the results of this study suggest that a brief individual MI intervention can have a significant positive impact on criminal risk in male prisoners. Following an average of just four hours of formal intervention, men who took part in MI increased their stage of change scores by a full stage, while the scores of men who did not were unchanged. Once released into the community MI prisoners had a 21% lower reconviction and a 17% lower re-imprisonment rate than their TAU counterparts: an impressive result for a moderately high risk sample. Further, survival analyses showed that they had longer mean time to re-conviction and re-imprisonment. The size of this programme effect is impressive; it compares favourably with the best effects for cognitive–behavioural interventions with offenders (Lipsey & Cullen, 2007; McGuire, 2002; Wilson et al., 2005). The effect is particularly striking when one considers that on average, men at the end of the MI programme still were only *contemplating* change, according to their Time 2 stage of change scores.

To examine whether MI interventions directed at criminal behaviour are best thought of as complete criminogenic programmes in their own right, or as preparing offenders to make more progress in the criminogenic programme that follows (e.g. Mann et al., 2002) we sought to investigate whether those who went on to a criminogenic programme after MI had better outcomes than those who were exposed to the MI intervention alone, a criminogenic programme alone, or no intervention.

Unfortunately, results show that it was not possible to fully examine this issue. We can conclude that MI is an effective criminogenic programme on its own. But by contrast the routinely available criminogenic programmes were not effective. Attending only a criminogenic programme had equivalent effects to not attending a programme at all. Following MI with a criminogenic programme had the same effect as MI alone.

Further, extrapolating from the results in Table 3, men may have started subsequent criminogenic programmes in a higher mean stage of change. Yet if anything, the trend in Figure 3 is towards poorer outcomes for these men. It could be speculated that this pattern shows that ineffective criminogenic programmes may have actually increased the risk of recidivism, undermining the gains made for the most successful men in the MI intervention.

Why was the criminogenic programme condition apparently ineffective in this study? All of the programmes in this condition were designed with reference to the international 'what works' research database. Some of these programmes have been demonstrated to reduce risk of reconviction (Anstiss, 2003), although numbers referred to these programmes were too small to disaggregate. However, at the time this study was designed, no independent outcome data were available on the most common programme attended by men in this study: the 70 hour New Zealand adaptation of the Canadian Reasoning and Rehabilitation programme (see McGuire, 2006). Data released after this study was completed suggest that overall, the programme has had a negative effect on subsequent recidivism (New Zealand Department of Corrections, 2005), probably due to poor programme integrity, and it has since been replaced. Therefore, it is likely that the effects of this programme are primarily responsible for the overall pattern of results for the criminogenic programme condition.

The third main objective of the study was to examine the validity of the stage of change variables derived from the CNI, both as measures of programme gain, and predictors of reconviction. The performance of the CNI-RTC variables in this study was promising. Scores for men not undergoing intervention remained stable, while those in the MI intervention rose on average a full stage of change after attending the four-session programme.

To examine the relationship of stage of change variables to outcome, we also investigated the predictive contribution of other offender characteristics with a series of logistic and Cox's regressions. We found that offenders' age and number of criminogenic needs were generally not related to recidivism. However, four variables were: higher actuarial risk (RoC*RoI scores), higher Time 1 stage of change scores, lower Time 2 stage of change scores (for Maori only), and lower stage of change difference scores were associated with increased rates of re-conviction. Time 1 stage of change scores did not predict time to reconviction, but Time 2 stage of change, and the amount of change in stage of change scores did.

The majority of these results were as expected: The RoC*RoI previously has been demonstrated to be a very accurate predictor of recidivism, with higher scores indicating higher rates of recidivism (Bakker et al., 1999). Similarly, both greater movement in stage of change, and higher stage of change should increase survival times and rates. However, the direction of the relationship between Time 1 stage of change and rates of future recidivism was contrary to expectations. One explanation is that the greater time lag between Time 1 assessments and release compared to Time 2 assessments reduced their predictive validity. The finding that Time 1 scores did not predict speed of reconviction is consistent with that view. Another possible explanation is based on the data showing that Time 1 stage of change scores were related to MI referral. Higher Time 1 scores made it more likely that the person would not be exposed to the intervention that was most effective in reducing recidivism: the MI programme.

What can be concluded from our results about whether the TTM appears to represent a valid method of assessing progress related to risk reduction in offenders? Although commonly applied to offenders (Day et al., 2006), research on the predictive validity of the TTM is limited, it has been challenged on a conceptual basis (Day et al., 2006) and the outcomes are mixed (see Polaschek et al., 2010). The New Zealand instrument used in this study – the CNI – is staff-rated and relies on behavioural evidence as well as offender self-report. Yet it has shown very good concurrent validity with a TTM-based offender self-report measure of stage of change (the University of Rhode Island Change Assessment; see Polaschek et al., 2010). In the data presented here, the TTM-based CNI stage of change variables contributed predictive validity not accounted for by the static risk algorithm. It is rare that dynamic measures of any kind make significant unique contributions over static instruments (Rice, 2007), so this result is promising both for the TTM, and for the validity of the CNI as a measure of risk-related and programme-related change.

Our results have important implications for current conceptualizations of prisoner rehabilitation. Although programmes with offenders that adhere to empirically established principles can achieve ecologically significant reductions in rates of subsequent recidivism, there is still substantial room for improvement. Commonly, even with an effective intervention, the majority of treated offenders still go on to reconviction and even re-imprisonment. In New Zealand as elsewhere, it is

becoming clearer that for moderate to high risk prisoners, even well designed and implemented criminogenic programmes need to be 150–300 hours in duration to achieve even half the effect size demonstrated here (Polaschek, 2006, 2010); with just four hours of programming.

The brevity of this intervention relative to its impact is intriguing, and should further stimulate endeavours to understand better *how* offenders change (Maruna, 2001). The results support speculation that MI-type interventions may promote change through mechanisms that are distinct from those at work in traditional cognitive–behavioural offender rehabilitation programmes. Most of those who desist from crime do so without formal intervention (Hanson, 2000; Walters, 2002). The implication of this finding is that men can make the desired changes without formally being taught all of the skills and knowledge that psychological researchers and correctional professionals deem necessary for them to make a success of parole.

In this study, the MI intervention may, for example, have effected some kind of 'turning point' for participants; a key mechanism identified in research on successful desisters (Maruna, 2001). MI interventions may generate change simply by developing a strong sense of agency, competency and responsibility in the prisoner participant. Increase in self-efficacy is thought to be one of the key mechanisms in the effectiveness of MI (Wilson & Schlam, 2004).[7] A sense of agency may be as important in reducing risk as learning the necessary lifestyle-management skills (Day et al., 2006), particularly in a prison context, where men often comment that they have little control over anything that happens to them. By contrast, our standard criminogenic programmes – which can convey the message that without the skills and knowledge therapists impart, men will inevitably fail on release – may engender resistance through appearing to coerce offenders into change, ironically lowering self-efficacy. Successfully working through these barriers to a point where positive changes are made may take far more time, and be achieved by fewer men.

There were several important limitations to this study. The design was quasi-experimental, and relied on the quality of routine service delivered by prison personnel, leading to various possible threats to internal validity. Sample sizes were small, especially for analyses conducted on the four subgroups. The most notable issue was the greater and more variable length of time between Time 1 and Time 2 assessments of stage of change for TAU men. A second design problem that affected only the stage of change analyses, was the missing data from Time 2 assessments for the TAU sample.

Further, the methodology sought to minimize the impact of the MI intervention on subsequent processing, to enable us to investigate a naturally formed 2 by 2 design. However, if prison staff were following operational requirements, and the MI intervention was effective, its graduates were at increased likelihood of referral on to additional programmes, thus introducing a bias created by MI attendance. This possibility could not be fully examined because we did not have access to data indicating whether criminogenic programme scheduling occurred at Time 1 or after Time 2. Although similar proportions of men went on to these programmes from each group, the Table 3 data suggest that indeed, men who made the most change in the MI intervention were differentially referred on to additional criminogenic programmes, thus violating independence. On a positive note, this loss of

independence allowed tentative observations of the effects of sending highly motivated people to ineffective programmes.

To address these limitations, subsequent research could (a) randomly allocate participants to the four quasi-experimental 'conditions' featured in this study, (b) repeatedly reassess stage of change at pre-determined intervals across all conditions, along with self-efficacy and any other promising dynamic risk or intermediate change variables, and (c) collect several indices of recidivism data after a reasonable follow-up period. The proposed design would also enable examination of whether MI and criminogenic programmes contribute unique variance in predicting subsequent recidivism; a preliminary step in investigating whether each effects change by distinct processes or mechanisms.

The failure to match MI to TTM stage could also be seen as a limitation by advocates of this position. The success of the intervention regardless of stage can be argued to provide more evidence that in practice MI interventions are valuable across a range of stages of change, and should serve to discourage endeavours that closely link stage of change to MI availability.

Beyond these suggestions, the next step is to examine offender characteristics that predict outcome from MI compared to criminogenic need-based programmes, and whether individual or group formats for MI are most effective. McMurran (2009) concludes that MI shows sufficient promise with offenders to warrant more substantial resource allocation for future implementation and research. Our findings support her conclusion, particularly given the inexpensive nature of this intervention compared to the standard alternatives. The effects on recidivism in moderate to high-risk prisoners challenge prevailing assumptions that programmes that actively target changes in skills and attitudes directly related to criminogenic needs are the only effective way to reduce reconviction risk, and support the calls for much more attention to how offenders change. In short, this study suggests that even quite reluctant horses may drink of their own accord once led to a suitable water supply.

Notes

1. The New Zealand male prison population comprises approximately 49% New Zealand Maori, 38% New Zealand European and 11% men from other Pacific Islands (e.g. Samoa, Tonga).
2. The manual is available from the first author.
3. Data for ANOVAs were not normally distributed. However, repeating analyses with transformed data did not change the significance of findings, as would be expected given the large effect sizes. Statistical assumptions for other analyses were met.
4. In these analyses, both MI and TAU samples include a mix of men who did and did not also complete a criminogenic programme.
5. The difference between the Time 1 RTC means here and in Table 1 arises because these analyses compare only those men with Time 2 data. No information was available on why these data were missing. It is most likely that the men were not reassessed because prison staff failed to follow the required procedures.
6. We did not conduct parallel analyses for re-imprisonment because of small sample sizes.
7. We had planned to measure self-efficacy in this research, but in the first study from this project, the data from our chosen measure (the GSE scale, Schwarzer & Jerusalem, 1995) had a median score of 40 (out of 40, $n = 260$), so they had to be discarded. A more sensitive measure of self-efficacy would be a valuable addition.

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