Establishing the Psychometric Properties of An Interactive, Self-Regulation Assessment Battery for Young Offenders

Annemaree Carroll, Francene Hemingway, Adrian Ashman, & Julie Bower

The University of Queensland
School of Education
Brisbane Q 4072
AUSTRALIA

Address for correspondence: Associate Professor Annemaree Carroll
The University of Queensland
School of Education
Brisbane Q 4072
Ph: (617) 3365 6476
Fax: (617) 3365 7199
Email: a.carroll@uq.edu.au

Running Head: Mindfields Assessment Battery for Young Offenders
Word Count: 7231 words (including references)
Keywords: juvenile delinquency; antisocial behaviour; self-regulation; impulsivity; goal setting.
Biographies

**Dr Annemaree Carroll** is Associate Professor in Educational Psychology at the School of Education, The University of Queensland, Brisbane, Australia. She received her PhD in educational psychology from The University of Western Australia. Her major research interests include at-risk behaviours of children and adolescents, self-regulation and goal setting, Attention Deficit Hyperactivity Disorder, and developmental trajectories of antisocial and aggressive behaviours.

**Francene Hemingway** is a clinical psychologist with Queensland Health. She received her Doctor of Clinical Psychology from the School of Psychology, The University of Queensland in 2006. Her research interests include at-risk children and adolescents, mental health in adolescents and adults, cognitive-behavioural interventions, and self-regulation.

**Professor Adrian Ashman**, is Professor of Education at The University of Queensland, Brisbane, Australia. He received his PhD in educational psychology from the University of Alberta, Canada. His research interests include cognitive educational psychology, classroom-based instruction, strategy training, problem solving, and at-risk youth.

**Julie Bower** is an Australian Research Council Doctoral Fellow. She received her Doctor of Philosophy in Education from The University of Queensland, Brisbane, Australia. Her research interests include self-regulation, youth at-risk, Indigenous youth issues, and prevention and intervention approaches.
Abstract

This research investigated the reliability and validity of the Mindfields Assessment Battery (MAB), measuring three components of self-regulation (forethought, performance control, self-reflection) of young offenders. Participants were 57 12- to 18-year-olds from youth justice service centres, alternative education schools, and a youth correctional facility ($N_{\text{males}}= 46$; $N_{\text{Indigenous}} = 7$). Psychometric properties of the battery were sound with adequate alpha levels for the scales. The factor structure and internal reliability of three measures were replicated and validated. Positive significant correlations found between these subscales indicated consistent relationships with young people’s responses to challenging situations. Pro-delinquency scores were significantly positively correlated with minor misdemeanours and negatively correlated with social competency. Significant positive correlations were found between social competence and goal commitment, and self-regulation and life satisfaction. The battery provides a reliable, valid way of assessing forethought, performance control, self-reflection, and treatment amenability within the conceptual framework of self-regulation.

Keywords: juvenile delinquency; antisocial behaviour; self-regulation; impulsivity; goal setting
Establishing the Psychometric Properties of An Interactive, Self-Regulation Assessment Battery for Young Offenders

The development of assessment instruments to assess self-regulatory functioning within juvenile delinquent populations has lagged behind the development of general clinical assessment measures and risk/need assessments for predicting recidivism (Le Blanc, 2002; Magar, Phillips, & Hosie, 2008). Furthermore, it is uncommon in the literature to find reports of the development of comprehensive test batteries for evaluating outcomes of treatment for this population that have both theoretical/conceptual and empirical bases. Traditionally, research on risk/need assessments has focused on treatment needs, likelihood of violence, and the likelihood of recidivism rather than the evaluation of treatment outcomes (e.g., Page & Scalora, 2004; Skeem & Monahan, 2011; Thompson & Putnins, 2003). Evaluation is, therefore, essential for determining the effectiveness of treatment (beyond reoffending statistics) and this can only be established through the use of valid and reliable measures.

Work by Hoge and Andrews (1996) and Thompson and Pope (2005) has supported the design of assessment batteries relevant to both research and service delivery objectives via multiple sources of information (e.g., young person, parent, support worker, police records) and in a variety of formats (e.g., checklists, scales, observation, interview, juvenile justice reports). The essential aim of batteries in evaluation studies is to track changes in young people resulting from an intervention or treatment although the majority for juvenile delinquents tends to focus on the evaluation of their risks and needs. The Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 1994) has been proposed as a sophisticated and psychometrically sound battery of risk/needs of juvenile offenders (see Le Blanc, 2002). The YLS/CMI employs interviews with offenders, reviews of file data and test scores, and collateral information about the offender. It is designed for completion by a mental health professional or other juvenile justice staff who have been trained in its use (Hoge & Andrews, 1996). The Australian adaptation of the YLS/CMI (YLS/CMI-AA,
Thompson & Pope, 2005) is comparable to the original version and evaluates major risk factors and provides an overall index of risk of juvenile offenders intended to assist in case management. The YLS/CMI is, however, not without limitation. The main deficiency is its narrow focus on risk factors reflecting a deficit-based approach to treatment planning and it is not an effective method for evaluating treatment outcomes.

The Communities that Care Youth Survey (CTCYS; Arthur, Briney, Hawkins, Abbott, Brook-Weiss, & Catalano, 2007) is a second instrument with a significant research profile. It has been established as a useful tool for identifying key community issues in regard to prevention programs for young offenders. The 121-item, pencil-and-paper, self-administered survey, using a 4- to 9-point Likert scale measures risk and protective factors across community groups to assist in planning strategies to overcome challenges including drug use, teen pregnancy, and youth violence (Glaser, Van Horn, Arthur, Hawkins, & Catalano, 2005). More recently, data have been collected using the CTCYS from high school students in Australia to assess the effects of school suspensions and arrests on disordered behaviour of youths (Hemphill, Toumbourou, Herrenkhol, McMorris, & Catalano, 2006).

While there are comprehensive tools relating to the assessment of risk to overcome recidivism in young offenders, there are no reliable and valid instruments reported in the literature for juvenile delinquents based on a robust conceptual framework of self-regulation and treatment amenability. Self-regulation has been the basis of a considerable body of research. According to Zimmerman (2000), self-regulation is the self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals, with personal, behavioural, and environmental factors being in a constant state of change during the course of learning and performance. Moreover, Zimmerman (2000) proposed a social cognitive-perspective of self-regulatory processes, including a cyclical model of self-regulation that incorporates three phases: forethought, performance control, and self-reflection. Forethought includes task analysis such as goal setting and strategic planning
and self-motivational beliefs such as self-efficacy and intrinsic value to the individual.
Performance control refers to self-control and self-observation. These help to focus on the
task and maximise effort. Reflection helps to determine what works and what needs to be
changed for future behaviours (Zimmerman, 2008). This model of self-regulated learning can
also be used in relation to adolescent offending behaviour. Evidence suggests that certain
antisocial behaviours, such as motor vehicle theft, require forethought, stringent behavioural
control, and elements of self-reflection (see e.g., Carroll, Hemingway, Bower, Ashman,
Houghton, & Durkin, 2006). Other activities, such as aggressive outbursts or physical attacks,
however, can result from deficits in self-regulatory processes such as impulsivity or poor
cognitive tempo (McGuire, 1996; Ross & Fabiano, 1985).

In terms of the first phase of self-regulation (forethought), the elements of forethought
are still developing during adolescents for both offenders and non-offenders (Gardner,
Dishion, & Connell, 2008). In particular, the aspirations, competence to make decisions, and
planning appear to differ between the two groups (see Carroll, Houghton, Durkin, & Hattie,
2009). According to Carroll et al., delinquent and at-risk adolescents attributed significantly
more importance to goals associated with a social image and peer recognition with delinquent
adolescents displaying a commitment to building and maintaining a non-conforming
reputation. Therefore, the targets set predictably depend on how much the outcome is valued
in addition to the extent to which individuals believe in themselves. Measuring the goal
setting capabilities along with the level of strategic planning in terms of social image and pro-
or anti-delinquency and levels of social competence would be important inclusions in
understanding the forethought phase of self-regulation for young offenders (Day, 2009).

There is also extensive evidence that impulsivity, a component of self-control found in
the second phase of self-regulation (performance control), is an important determinant of
delinquent behaviour (Farrington, 1990; Gottfredson & Hirschi, 1990; Vitacco, Neumann,
Robertson, & Durrant, 2002; White, Moffitt, Caspi, Bartusch, Needles, & Stouthamer-Loeber,
White et al., for example, studied the role of impulsivity in the development of antisocial behaviour in boys via a multi-method and multi-source assessment. Cognitive impulsivity was measured using cognitive tasks that require mental control (e.g., time perception, delay of gratification, cognitive tempo) while behavioural impulsivity was measured using self-report items that indicate whether tasks are approached in an under-controlled and disinhibited way. White et al. found that both cognitive and behavioural impulsivity were significantly and positively related to delinquency.

A more recent study by Thompson, Whitmore, Raymond, and Crowley (2006) found significant group differences between adolescents with serious conduct problems compared to community controls on impulsivity measures, both on cognitive and behavioural self-report measures. Therefore, it would appear that in considering the measurement of the performance control phase of self-regulation, data should be gathered on both cognitive and behavioural impulsivity using a representative set of instruments (White et al., 1994).

The consideration about one’s life satisfaction and the ability to self-regulate emotions fall into the third phase of self-regulation, self-reflection. In this area, Donohue, Teichner, Azrin, Weintraub, Crum, Murphy, and Silver (2003) investigated life satisfaction among problem youths (substance using and conduct disordered adolescents) and found that males were more satisfied with external obligations than females and that all youths in this study reacted against controls imposed by parents or other authority figures, such as teachers and police. According to Eisenberg, Guthrie, Fabes, Reiser, Murphy, Holgren, et al. (1997), the inability to regulate negative emotions has been linked to disruptive and aggressive behaviour with irritability, difficult temperament, and negative emotional reactivity being common among those manifesting these problems. In measuring self-reflection then, satisfaction with current events and ability to reflect on one’s emotions would be important considerations.

Deficits in self-regulation are evidently linked to the onset and maintenance of delinquency with several measures assessing aspects of self-regulation such as goal-setting,
impulsivity, and self-reflection. However, infrequently have these measures been used in combination to provide a comprehensive snapshot of the self-regulatory behaviours of young offenders. Importantly also for adults and teenagers in successful program outcomes is motivation. Gideon (2010) stated that true motivation is characterised by compliance with treatment program requirements. He argued that an essential element in motivation is the recognition that a problem exists; the link to treatment readiness.

Among samples of offenders it appears that adolescents who engage in antisocial behaviours are less motivated to change than are older individuals and that lower motivation is associated with poorer treatment attendance and less favourable outcomes (Melnick, De-Leon, Hawke, Jainchill, & Kressel, 1997; Slesnick, Bartle-Haring, Erdem, Budde, Letcher, Bantchevska, & Patton, 2009). Therefore, an essential element of working with adolescent offenders is to identify those that acknowledge their difficulties and are contemplating change. Prochaska and DiClemente (1982) first developed the stages of change model, comprising four stages (precontemplation, contemplation, action, and maintenance) during their investigation of processes that adults use independently to change their troubled behaviours. The model has been applied to a wide range of health-related and addictive behaviours including offender rehabilitation (Hemphill & Howell, 2000). While it has been found to be an important component to be measured for adolescents entering psychotherapy or treatment programs (Cohen, Glaser, Calhoun, Bradshaw, & Petrocelli, 2005), few instruments exist pertaining to readiness for change during the adolescent years.

The Mindfields Assessment Battery (MAB) was designed to capture the quality and extent of self-regulatory strategies used by adolescents, particularly juvenile delinquents located in community- and detention-based settings. The MAB comprises 10 measures: eight of self-regulatory processes, and one measure each of self-reported delinquency and readiness for change. The measures and self-report questionnaires are delivered via a computer-based package. The measures are task-orientated and require participants to interact with the
computer in a game-style format to produce results. The MAB draws upon an extensive literature that has a sound conceptual framework based on self-regulation (Vohs & Baumeister, 2004; Schunk, 2008; Schunk & Zimmerman, 1998; Zimmerman, 2000; 2008).

The purpose of the present research, therefore, is to redress limitations in the literature related to the lack of existing measures that enable a full evaluation of offenders’ self-regulation capabilities. The paper describes the psychometric properties of the MAB using an Australian sample of juvenile delinquents. Specifically, the research aimed to: establish evidence of a reliable assessment battery through statistical analyses; establish construct validity of independent measures of self-regulation; and, establish concurrent validity through moderate positive relationships between measures within each component of self-regulation.

**Method**

**Participants**

Participants were 57 adolescents aged 12 to 18 years ($M_{age} = 15.26$ years, $SD = 1.51$); 46 males ($M_{age} = 15.24$, $SD = 1.51$) and 11 females ($M_{age} = 15.17$, $SD = 1.47$). They were recruited into the Mindfields Adolescent Self-Regulation Program from the Brisbane youth detention centre, the four Department of Communities Youth Justice Service Centres, two alternative education schools and two flexible learning network centres in the capital city of Queensland, Australia. These services represented a range of centres in which young people who engage in delinquent behaviours are supported. All referred adolescents were under the supervision of a case manager, youth worker, probation officer, guidance officer, or teacher at the time of participation. There were no significant differences between sub-samples (e.g., detention vs. education centres). The Mindfields Adolescent Self-Regulation Program was developed as a self-regulatory program aimed at empowering young people to examine and change their lives (see Carroll, Bower, Hemingway, & Ashman, 2007).

In the present study, Indigenous Australians were over-represented, comprising 12.3% of the sample ($n = 7$) in contrast to 2% in the general population in Australia. Approximately
half of the sample was residing with their birth family (49.1%). Thirty percent had an official offending history and 19.3% were under juvenile justice supervision at the time of assessment. The most predominant behavioural characteristics included alcohol use (24.5%), trauma associated with death of a family member or friend (22.8%), literacy and numeracy problems (22.8% and 15.8% respectively), diagnosis of attention deficit hyperactivity disorder (17.5%), marijuana use (15.9%), and a history of child protection orders (14.0%).

**Measures**

The MAB was developed in the style of an interactive computerised comic book and uses graphics, voiceovers, and acted videotaped scenarios to enhance engagement, accommodate low literacy levels, and overcome difficulties associated with traditional paper-and-pencil tests (e.g., interest level; see [www.mindfields.com.au](http://www.mindfields.com.au) and Figure 1 for example of screenshot). Indigenous young people recorded approximately 60% of the voiceovers to be consistent with the cultural identity of the Indigenous delinquent youths.

<Insert Fig. 1 here>

Measures were included in the MAB to assess each construct of self-regulation: three measures of forethought (i.e., goal setting, pro-delinquency, social competence); three measures of performance control (i.e., impulsivity, delay of gratification, reaction time); and two measures of self-reflection (i.e., self-regulation, life satisfaction). A brief measure of delinquent activity is included to provide a snapshot of the frequency of involvement in delinquent behaviour. A new measure is also included (The Changing My Life Scale) to provide a description of the participant’s readiness for change.

**The Forethought Component of Self-Regulation**

*Goal Setting* (Carroll, Durkin, Hattie, & Houghton, 1997; Carroll, Gordon, Haynes, & Houghton, 2011). This measure was based on previous research that investigated the goal orientations of delinquent, at-risk, and not-at-risk adolescents. It consists of three sections about future ambitions, beliefs about their goal(s), and goal commitment. The first section
requires the participant to type in any goals they may have. They are given the option of including up to five goals (typed in separately). Following this, the participants rank their goals in order of importance with “1” indicating their most important goal. Section two then introduces three questions about their most important goal: “How long do you think it will take you to achieve this goal?” Responses included “1 week”; “1 month”; “1 year”; “more than 1 year”. Question two asks, “How much control do you have in achieving this goal?” Responses included “no control at all”; “some control”; “a lot of control”; “total control”. Question three asks. “How likely do you think it is that your goal will come true?” Responses included “not at all”; to some extent”; “very much”; “almost certain”. Section three consists of nine statements about their commitment to achieving their most important goal whereby responses are recorded on a 4-point Likert-type scale ranging from “1” = “strongly disagree” to “4 = “strongly agree”. An example statement is, “I really want to get this goal.” Throughout sections two and three, the most important (or number one) goal is repeated at the top of the screen.

Scoring occurs for the goal commitment component (section three) whereby items are summed (with items 3, 4, 5, 6, 7, and 8 being reverse scored) to reflect an overall total score, where higher scores indicate greater goal commitment. Carroll et al. (1997) reported that the alpha coefficient for the 9-item unidimensional scale was $\alpha = .74$, suggesting adequate internal consistency.

Hang Out is a newly developed pro-delinquency scale using interactive video role-plays in which participants view nine hypothetical problem scenarios based on a range of risky behaviours (e.g., stealing cigarettes on the dashboard of a car with an open window; getting in a stolen car for a joy ride; under-age drinking) with which a group of five adolescents actors (four males and one female) are confronted. The scenarios focus on the decisions of these adolescents. Participants work independently through each scenario and at
the conclusion of each scene, three choice points are depicted by picture graphics congruent with the choice theme.

Voiceovers are activated by moving the mouse over the picture of each option. There are three choices available that reflect either a pro-delinquent or anti-delinquent response. Participants choose their preferred option by using the computer mouse. For example, scenario one consists of four adolescent males sitting outside a convenience store discussing options for obtaining cigarettes. The conversation includes waiting for someone to walk by to ask them for money, getting money from one of the boys’ brothers. Eventually, one boy says that there is a packet of cigarettes on the dashboard of a car in the car park next to the store. The participant is asked to respond to the suggestion of stealing the cigarettes from the car. The three response choices (real-life voiceovers activated by hovering over the related picture) include: (a) “Nah man, I’m right. I’m cruising down to the park. Want to come play some football, bro?” represented by the image of a football (anti-delinquent response); (b) “Yeah, let’s go then man. Let’s go and steal those smokes then!” represented by a car and packet of cigarettes (pro-delinquent response); and (c) “Yeah alright man, I don’t care. I’m with you guys” represented by a thumbs up image (pro-delinquent response).

The response type (i.e., pro-delinquent or anti-delinquent) is randomly positioned throughout the nine scenarios. Participants scored 1 or 0 based on their pro-delinquent (1) or anti-delinquent (0) responses for each scenario. A total score for pro-delinquency was calculated by summing the number of pro-delinquent responses to the scenarios. One scenario has no pro-delinquent response (party) and was not included in the calculations, therefore, there was a possible range of scores from 0 to 8. As this is a new scale, no psychometric properties have been reported.

Adolescent Problem Inventory—Modified (Kuperminc, Allen, & Arthur, 1996). This social competence measure is an adaptation of the Kuperminc et al. (1996) instrument. The present version consists of six hypothetical situations. The situations include conflicts with
peers, parents, and teachers, and situations in which adolescents might be tempted to engage in acts of delinquency. These include: being asked to deliver drugs and receive drugs and money in return; and giving advice to a female friend who has discovered she is pregnant.

Participants respond verbally as if they are actually talking directly to the person in the situation. Performance competency is rated on a 4-point scale from very competent to very incompetent. Facilitators rated each of the adolescents’ responses according to the coding manual (Kuperminc et al., 1996). All facilitators attended training sessions that dealt with coding rules for scoring the API and all achieved coding proficiency. Maximally competent responses were those that would most likely resolve the conflict and reduce the likelihood of its recurrence. Total scores were calculated by summing ratings across all items with higher scores reflecting greater competency in social skills. Previous research with this instrument found an internal consistency of \( \alpha = .79 \) for males, and \( \alpha = .85 \) for females and adequate concurrent validity (\( r = .93; \) Leadbeater, Hellner, Allen, & Aber, 1989).

**Performance Control Component of Self-Regulation**

*The Impulsivity Scale.* The Impulsivity Scale is a 13-item self-report questionnaire of impulsive behaviour in adolescents and adults based on the impulsiveness subscale of Eysenck and McGurk’s Impulsiveness Questionnaire (1980). The 13 items were written to reflect everyday impulsive actions by Australian adolescents using familiar language and vocabulary. Responses were recorded on a Likert-type scale where “4” = “always” and “1” = “never”, with total scores calculated by summing responses to all items with higher scores indicating higher impulsivity. Recent use of the scale yielded an internal consistency figure of \( \alpha = .84 \) (Carroll et al., 2006), strengthening an argument for unidimensionality.

*Delay of Gratification.* This is a new instrument in which adolescents are presented with a computerised task involving a card game whereby they are given a choice between two cards. The amount of reward is dependent on the amount of time passing (e.g., “depending on how long you wait, you might increase your winnings …”). Participants click on a card, either
red or green, and dependent on the amount of time that has passed, they win either $1 (e.g., 1–9 seconds) or $5 (e.g., 10+ seconds). Guessing a correct coloured card is irrelevant.

Rodriguez, Mischel, and Shoda (1989) argued that the ability to delay gratification is facilitated by children’s knowledge and understanding of the delay rules. Their findings suggested such self-regulatory knowledge is a significant predictor of self-regulation behaviour. The current delay of gratification procedure has addressed previous limitations of self-report questionnaires (e.g., social desirability bias), monetary incentives (e.g., expensive, sufficient incentive dependent on dollar amount, ethical boundaries), and inadequate balances between the amount and delay of reinforcement (previously found to be correlated) (Wulfert, Block, Ana, Rodriguez, & Colsman, 2002). The unit of measurement is the amount of time (in seconds) that passes. The longer duration of time attained indicates a greater ability to delay gratification. As this is a newly developed measure, no previous psychometric properties have been reported.

*Test Your Reflexes.* The stop-go task to measure reaction time developed for the present study, involved participants being presented with a series of Xs and Os on the computer screen with the instruction “In this activity click as soon as you see an X, but don’t click if you see an O”. Participants were required to withhold a reflexive response to the presentation of an O. A trial consisted of 32 zeros and crosses being randomly presented on the screen with zeros appearing in 25% of presentations, and a stop signal delay time of 500 milliseconds (i.e., amount of time between presentation of X [go signal] and O [stop signal]).

The amount of time taken to click the mouse in seconds is recorded. Logan, Schachar, and Tannock (1997) argued that the stop-signal paradigm is a model of inhibitory control of an automatic impulse, such that in real world settings a stop-signal may come from an external (e.g., stop light, teacher) or internal (e.g., re-evaluation of situation) source. From this perspective, failing to inhibit when a stop-signal is presented (e.g., O in current task) is evidence of poor impulse control. A faster mean go reaction time (average amount of time
taken to click button on go task, X) indicates impulsivity or poor inhibitory control. As this is a newly developed test, no previous psychometric properties have been reported.

**Self-Reflection Component of Self-Regulation**

*Short-Form Self-Regulation Questionnaire (SSRQ).* A short-form of the original 63-item self-regulation questionnaire (SRQ; Carey, Neal, & Collins, 2004) is a 31-item instrument designed to measure the generalised ability to regulate behaviour in the short-term to achieve desired outcomes in the future. The SSRQ was developed to reduce respondent burden with responses on a 4-point scale (‘1’ = “strongly disagree” to “4” = “strongly agree”). Item examples include, “I put off making decisions,” “I can stick to a plan that’s working well,” and “I learn from my mistakes.” Fourteen of the 31 items were reversed scored. A total score is calculated by summing responses to all items, with higher scores indicating greater self-regulation. The SSRQ correlated highly with the original 63-item SRQ $r = .96$, and showed good internal consistency ($\alpha = .92$). Support for convergent and discriminant validity was demonstrated (Neal & Carey, 2005).

*Life Satisfaction Scale for Problem Youth (LSSPY; Donohue et al., 2003)* was used to assess adolescents’ self-reported subjective satisfaction in 13 key areas of their lives, namely, friendships, family, school, employment/work, fun activities, appearance, dating, use of drugs, use of alcohol, money/material possessions, transportation, control over one’s own life, and overall life satisfaction. There is also a general life satisfaction item. Satisfaction/happiness is rated using a 10-point scale from “1” = “unhappy” to “10” = “happy”. Three subscales emerged from factor analysis: social satisfaction, satisfaction with external obligations, and substance use satisfaction. Scores for each subscale were calculated by averaging items. The LSSPY has good internal consistency $\alpha = .74$ and criterion-related validity (Donohue et al., 2003).
**Delinquent Activity**

The *Modified-Adapted Self-Report Delinquency Scale* (mod-ASRDS; Carroll, Durkin, Houghton, & Hattie, 1996) is a 12-item short form of the Adapted Self-Report Delinquency Scale (ASRDS), a 44-item scale covering a wide range of frequently occurring delinquent acts with wording consistent with adolescent usage. The mod-ASRDS was constructed by including the three highest loading items for each of four factors (school misdemeanours, soft drug use, stealing offences, and property abuse) that represent the more common adolescent offences found in a sample of 1,250 young Australians aged 12 to 17 years (Carroll et al., 1996). Item examples are: “Have you in the past month, stolen money of $10 or more in one go?” and “Have you in the past month, deliberately hurt or beat up someone?” The response set draws from a 4-point Likert-type scale: “never”, “hardly ever”, “sometimes”, and “often”. Scores for all items on the mod-ASRDS are summed (maximum = 48) with a high score being indicative of a young person engaging in delinquent behaviours. The authors have reported that in two administrations of the mod-ASRDS with separate samples, the factorial structure and reliabilities were found to be robust, with the majority of factors exceeding alpha values of .70. Recent reliability analysis of the mod-ASRDS revealed good alpha levels ($\alpha = .81$ to .85; Carroll et al., 2009; Law, 2007).

**Readiness for Change**

The *Changing My Life Scale* (CMLS) is a 28-item questionnaire dealing with the respondent’s readiness to change their life course. The CMLS was developed by Carroll, Ashman, Bower, and Hemingway (2007) to assess the change process in Australian juvenile delinquents. Items were generated to reflect each of the subscales as follows: Pre-contemplation—“I don’t have a problem with the way I act”; Contemplation—“Now is the time to make some positive changes in my life”; Action—“I often seek advice from others about how to achieve my goals”; and Maintenance—“I know what to do when I face the same problem a second time.” Responses are given on a 4-point Likert-type scale ranging from “1”
= “strongly agree” to “4” = “strongly disagree”, with low scores indicating readiness for change on all scales except Pre-contemplation on which a low score indicates an unwillingness to change. As this is a newly developed scale, no published psychometric data are available, however, during a trial of the measure with a university sample the internal consistency was $\alpha = .77$ and the four factors were identified using principal components analysis.

**Procedure**

Written consent for the use of pre-established measures was obtained from the appropriate authors. Information brochures were given to facilitators, site staff, and young people. Consent forms to voluntarily participate were obtained from all participants and their parents or guardians. Confidentiality of all information provided by participants was assured. All information obtained from participants was de-identified by means of an alpha-numeric identification code (ID). The IDs were allocated by facilitators and were used on all subsequent pieces of information gathered from participants. Trained facilitators administered the MAB on-site with participants in a one-on-one situation in a private room. The MAB was completed via facilitator-provided laptops or site-provided personal computers. All participants were given the same verbal explanation about the MAB and invited to ask questions before and after the administration of the MAB. Completion of the MAB takes approximately 30 minutes to one hour depending on participants’ literacy levels.

**Results**

In accordance with the aims of the study, we set out to determine whether the factor structure and internal reliability of the CMLS and LSSPY could be replicated and validated using a juvenile delinquent population. The other measures (e.g., the mod-ASRDS, Goal Commitment, Hang Out, API, Impulsivity, Delay of Gratification, Test Your Reflexes, SSRQ) do not produce data that can be subject to analyses such as principal components
analysis. We then examined concurrent validity of the CMLS and of the measures within each component of self-regulation.

**Construct Validity and Internal Consistency**

Item responses of 57 participants were analysed for the CMLS and LSSPY by principal components analysis. It is recognised that each of these analyses exceeds some of the expectations in terms of number of items being subjected to analysis and the number of participant responses. Nevertheless, as can be seen in the following results, the factor solutions reflect the original factor patterns, with only a small number of items loading atypically.

The CMLS was developed specifically for the MAB and, therefore, does not have published psychometrics properties. The scale was trialled with 82 undergraduate university students prior to its inclusion in the MAB. The university sample comprised 62 female and 20 male students aged 18 years to 52 years ($M_{\text{age}} = 22.54$ years, $SD = 7.22$) most of whom were in their second year of a psychology degree. Using principal components analysis with Varimax rotation, four factors were extracted and named *Self-Satisfaction*, *Intentionality*, *Need for Assistance*, and *Self-Assurance*. Table 1 displays the factor solution for the Australian juvenile delinquent sample in the present study. Cronbach’s alphas were calculated for each of these variable sets as follows: *Self-Satisfaction*, $\alpha = .73$; *Intentionality*, $\alpha = .83$; *Need for Assistance*, $\alpha = .63$, *Self-Assurance*, $\alpha = .74$.

In previous research using 193 adolescents who were substance abusers and had a conduct disorder (Donohue et al., 2003), the 13 items of the LSSPY produced three factors (social satisfaction, satisfaction with external obligations, and substance use satisfaction). In the present study, principal components analysis with Varimax rotation yielded three factors that although they could be labelled according to the Donohue et al. solution, the items loaded somewhat differently. The *Substance Use Satisfaction* factor included two extra items (money...
and employment—access to these might enable access to drugs and alcohol), the Social Satisfaction factor did not include two items (family and money), and the Satisfaction with External Obligations included family but not employment. This solution seems appropriate for this group of Australian young offenders (see Table 2). Cronbach’s alpha was calculated for the LSSPY (α = .71).

*Insert Table 2 here*

For the remaining scales, Cronbach’s alphas were calculated and were as follows:

Goal Commitment, α = .81; Hang Out, α = .88; API, α = .72; The Impulsivity Scale, α = .84; DOG, α = .84; Test your reflexes, α = .75; SSRQ, α = .91; and Mod-ASRDS, α = .92.

**Concurrent Validity**

To determine concurrent validity, inspection of bivariate correlations between the subscales of the CMLS was performed. Table 3 displays the correlations between subscales of the Changing My Life Scale. Table 3 shows a significant positive correlation between Self-Satisfaction (“I don’t want to change anything about myself”) and Self-Assurance (“If I stay the way I am, things will work out in the end”), r = .42. Intentionality (“Now is the time to make some positive changes in my life”) is significantly correlated with Need for Assistance (“I need some help to make the changes I want to make”), r = .30, and Self-Assurance (“I usually work hard to achieve my goals, even with setbacks”), r = .35. These relationships would appear to be consistent with young people’s responses to challenging situations.

*Insert Table 3 here*

The forethought component of self-regulation contains measures of pro-delinquent behaviour (Hang Out), goal commitment, and social competence (API) with an anticipation that social competence would be related to less tendency toward delinquency and greater commitment to goal setting for positive future outcomes. We first sought any positive relationships between pro-delinquency and self-reported delinquency and then between pro-
delinquency and social competence, and finally between social competence and goal commitment.

The Hang Out scenarios reflected social dilemmas in which young people might find themselves on a day-to-day basis. Most of the young people responded to these scenarios by choosing socially responsible options as is shown by their low pro-delinquency scores ($M = 2.2; SD = 2.1; \text{Range} = 0-8$). The pro-delinquency score indicates that on average, the young people were disposed to choose the delinquent option in 3 of the 8 scenarios (choosing between playing a computer game or going to a party where there is alcohol; stealing cigarettes from an open, unoccupied vehicle; and, accepting a lift to a party with an unlicensed driver).

The participants’ pro-delinquency scores were significantly correlated with the individual items of the mod-ASRDS (Carroll et al., 1996). There were four significant correlations between the pro-delinquency score and the mod-ASRDS items: Stolen money greater than $10 (r = .43, p < .05); Broken into a house (r = .43, p < .05); Damaged property (r = .44, p < .05); and Shoplifting (r = .56, p < .001). It is interesting that there were no significant correlations between the pro-delinquency scores on Hang Out and any of the serious aggressive delinquent behaviours included as items on the mod-ASRDS (e.g., robbery with a weapon or violence; used or threatened violence to steal; driving a car at high speed).

Pro-delinquency scores were also correlated with the total API score ($r = -.47, p < .001$). This indicates that those participants with greater social competence were less likely to choose the pro-delinquency option in the Hang Out scenarios, than those with less social competence. Finally, we found a significant positive correlation between goal commitment and the API, indicating that those participants with greater social competence had higher commitment to their highest ranked goal than those with less social competence.

The performance control component of self-regulation contains measures of impulsivity (The Impulsivity Scale), delay of gratification, and reaction time (Test your
Reflexes). There was an expectation that there would be a significant correlation between The Impulsivity Scale score and the other performance control measures. Table 4 displays the correlations for the *performance control* component of self-regulation. There was a small but statistically significant negative correlation between delay of gratification and average go-signal reaction time ($r = -0.30, p < 0.05$). See Table 4 for details.

<Insert Table 4 here>

Table 5 shows the correlations within the *self-reflection* component of self-regulation. It was anticipated that self-regulation would be correlated with the subscales of life satisfaction. As expected, self-regulation was significantly correlated with overall life satisfaction ($r = 0.29, p < 0.05$), suggesting those that have self-regulatory skills are more satisfied with their lives. Overall, life satisfaction was significantly correlated with social satisfaction ($r = 0.44, p < 0.002$) and satisfaction with external obligations ($r = 0.52, p < 0.001$). Satisfaction with external obligations and social satisfaction were also significantly correlated ($r = 0.32, p < 0.03$). Satisfaction with substance use failed to correlate significantly with similar constructs.

<Insert Table 5 here>

**Discussion**

The MAB is intended to assess young persons’ self-regulatory capacities. It can be used as a stand-alone test battery or in association with an intervention. It provides evaluations of the three components of self-regulation (forethought, performance control, and self-reflection), self-reported delinquency, and readiness for change. The purpose of the present study was to describe the psychometric properties of the MAB using an Australian sample of juvenile delinquents. Specifically, we aimed to establish evidence of a reliable and valid assessment tool. Here, we provide an overview of the key findings of the study, and discuss the limitations associated with the relatively small sample of youths and self-report data.
assessments. In closing, we provide an overview of implications of the MAB and future research possibilities.

Overall, it would appear that the battery provides a cross-sectional evaluation of the capacity of young people to determine appropriate behaviours for satisfactory life outcomes. Of importance is the conceptual foundation of the battery based on the social cognitive-perspective of self-regulatory processes that incorporates a cyclical model of self-regulation with three phases: forethought, performance control, and self-reflection (Zimmerman, 2000).

We have also taken into consideration the notion of readiness for change. There are few instruments developed to measure readiness for change in accordance with the transtheoretical model. These are commonly used to assess readiness for change in regard to substance abuse, and items describe particular behaviours (e.g., Cohen et al., 2005; McConnaughy, Di Climente, Prochaska, & Velicer, 1989).

We have identified three significant findings. Firstly, the data provide indications of the psychometric strength of the various measures. For example, alpha coefficients for the measures are universally strong and the internal consistency is secure as shown by an examination of alpha levels of the scales, which are moderate to high. These findings taken together support the first research aim.

Secondly, the conceptual foundations of the measures are generally consistent with original tests, that is, where these have been subjected to principal components analysis, the factor structures shown in this study are similar to those reported in the literature. Where differences were found, the patterns are understandable given the personal characteristics of the sample of delinquent youths where their behaviour patterns might be more oriented toward personal gratification rather than social responsibilities.

Thirdly, there were several analyses that examined concurrent validity. In general, for each of the components of self-regulation, the scales and subscales produced significant correlations indicating that similar constructs were being tapped. For example, the
participants’ responses to the Hang Out measure revealed links only to the less serious delinquent activities in the mod-ASRDS. The Hang Out items that attracted the highest pro-delinquency responses reflected activities that were opportunistic and impulsive and correlated with items on the mod-ASRDS of similar severity.

While the results of the study provide optimism in respect of the potential value of the battery, they are based on a relatively small, purposive sample of youths whose characteristics are atypical for their same-age peers within the general population. Hence, it is important to explore the response characteristics of the broader population to place the responses of the delinquent youths into context.

A second consideration is the potential for bias within the data based upon self-reports. We have no basis on which to judge the extent to which the young people were responding dishonestly to the various requests. Facilitators who presented and monitored the computer-based administration reported no indication that the participants were interacting negatively with the tool or responding inconsistently with their views. Future developments of the scale might include a lie scale as response-bias is an important component to account for when evaluating scale validity.

There are some indications in the literature that low literacy levels affect self-report assessments. For example, Muirhead and Rhodes (1998) used a standardised reading test with 4,813 offenders and found that 19.1% of the sample could read at only a Grade Five level or lower. We attempted to overcome this limitation through the use of a computer-administered battery including voiceovers, graphics, and visual indicators. This format appeared to be successful in maintaining interest and motivation of the juvenile offenders that might have otherwise invalidated the test results. There are also obvious advantages in using self-report instruments, and in the case of the MAB, there is an added advantage of standardising the presentation of items and a programmed scoring system, reducing time involved in scoring.
multiple test results. These methods appear to have been useful for gaining information on sensitive topics by removing interactions with another person.

Overall, the findings of the present study are encouraging. Further refinements of the newly developed measures would seem warranted to make them more relevant to a wider adolescent population than they are at present. Instruments such as *Hang Out* and API may need some adaptation to include scenarios that are not delinquency-based but provide dilemmas that young persons may confront in their everyday lives. For example, in the current version of the API, there are items that relate to antisocial and marginally criminal events that might be relevant to the offender population in the current study, but would be less appropriate for most young people. New items could be developed to enable all young people to respond in diverse ways to common dilemmas.

Further administrations of the MAB should confirm the reliability of the instrument and provide insights into the effectiveness of rehabilitation efforts with delinquent youths who are ready for life changes. The MAB provides a basis of examining young people’s change responsiveness and their ability to self-regulate. Putting this into the context of a broader population would be a useful addition to the reporting process from the MAB. Being able to situate a young person’s score within their own subgroup but also to locate that within the broader population, would give indications of where youths with histories of delinquency might show strengths and areas for personal development that are aligned with their peers in the general population. Conversely, it might also show areas where there are major concerns that would need addressing or at least recognition by youths before venturing into treatment or intervention programs.
References


Acknowledgements

The research reported in this paper was supported by The Australian Research Council Linkage Grant Scheme.
Table 1

*Factor Loadings of the Current Juvenile Delinquent Sample on the CMLS*

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Self-Satisfaction</strong></td>
<td></td>
</tr>
<tr>
<td>Item 8: If I change some things about the way I am, life would be better</td>
<td>-.76</td>
</tr>
<tr>
<td>Item 4: I’m going along fine the way I am without having to make changes</td>
<td>.74</td>
</tr>
<tr>
<td>Item 6: There are better ways of doing things than how I’m doing them now</td>
<td>-.69</td>
</tr>
<tr>
<td>Item 14: I don’t want to change anything about myself</td>
<td>.61</td>
</tr>
<tr>
<td>Item 2: I don’t have a problem with the way I act</td>
<td>.49</td>
</tr>
<tr>
<td>Item 11: I don’t have a problem with who I am as a person</td>
<td>.36</td>
</tr>
<tr>
<td><strong>Factor 2: Intentionality</strong></td>
<td></td>
</tr>
<tr>
<td>Item 27: I have set some clear goals for some changes I want to make</td>
<td>.81</td>
</tr>
<tr>
<td>Item 15: I am already working on some of my problems</td>
<td>.79</td>
</tr>
<tr>
<td>Item 19: I know what to do when I face the same problem a second time</td>
<td>.75</td>
</tr>
<tr>
<td>Item 23: I know how to get help to make the changes I want</td>
<td>.71</td>
</tr>
<tr>
<td>Item 28: I’m happy to accept the consequences of doing things the way I do them now</td>
<td>.64</td>
</tr>
<tr>
<td>Item 12: Now is the time to make some positive changes in my life</td>
<td>.58</td>
</tr>
<tr>
<td>Item 22: I have the skills I need to work on my problems</td>
<td>.55</td>
</tr>
<tr>
<td>Item 16: Every now and then I stop to check that I’m making the right decisions about where my life is going</td>
<td>.54</td>
</tr>
<tr>
<td>Item 17: If there’s something about myself I don’t like, I try to change it</td>
<td>.49</td>
</tr>
<tr>
<td>Item 24: I will be successful in making changes, even thought there may be ups and downs</td>
<td>.42</td>
</tr>
<tr>
<td><strong>Factor 3: Need for Assistance</strong></td>
<td></td>
</tr>
<tr>
<td>Item 20: I accept advice from others about how to make changes in my life</td>
<td>.71</td>
</tr>
<tr>
<td>Item 3: I need some help to make the changes I want to make.</td>
<td>.59</td>
</tr>
<tr>
<td>Item 7: I’ve already thought through the steps I need to take to change some things in my life</td>
<td>.56</td>
</tr>
<tr>
<td>Item 13: I often seek advice from others about how to achieve my goals</td>
<td>.54</td>
</tr>
<tr>
<td>Item 9: I know some things I need to do but not everything to make the changes I want</td>
<td>.52</td>
</tr>
<tr>
<td><strong>Factor 4: Self-Assurance</strong></td>
<td></td>
</tr>
<tr>
<td>Item 5: People close to me accept me just the way I am</td>
<td>.77</td>
</tr>
<tr>
<td>Item 21: When things go wrong, I usually bounce back right away</td>
<td>.64</td>
</tr>
<tr>
<td>Item 26: I can deal with unexpected events that change my life</td>
<td>.52</td>
</tr>
<tr>
<td>Item 18: If I stay the way I am, things will work out OK in the end</td>
<td>.51</td>
</tr>
<tr>
<td>Item 25: I usually work hard to achieve my goals, even with setbacks</td>
<td>.45</td>
</tr>
<tr>
<td>Item 1: I feel confident about facing new problems</td>
<td>.41</td>
</tr>
<tr>
<td>Item 10: I always look for better ways of dealing with the problems I face</td>
<td>.39</td>
</tr>
</tbody>
</table>
Table 2

Factor Loadings of Current Juvenile Delinquent Sample on the LSSPY

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 5: Things I do for fun</td>
<td>.82</td>
</tr>
<tr>
<td>Item 7: Sex life/dating</td>
<td>.72</td>
</tr>
<tr>
<td>Item 6: My appearance</td>
<td>.62</td>
</tr>
<tr>
<td>Item 1: Friendships</td>
<td>.61</td>
</tr>
</tbody>
</table>

**Factor 1: Social Satisfaction**

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 12: Amount of control over what happens in your life</td>
<td>.85</td>
</tr>
<tr>
<td>Item 11: Transportation</td>
<td>.68</td>
</tr>
<tr>
<td>Item 3: School</td>
<td>.53</td>
</tr>
<tr>
<td>Item 2: Family</td>
<td>.44</td>
</tr>
</tbody>
</table>

**Factor 2: Satisfaction with External Obligations**

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 9: Use of alcohol</td>
<td>.77</td>
</tr>
<tr>
<td>Item 8: Use of drugs</td>
<td>.73</td>
</tr>
<tr>
<td>Item 10: Money and material possessions</td>
<td>.59</td>
</tr>
<tr>
<td>Item 4: Employment</td>
<td>.52</td>
</tr>
</tbody>
</table>

**Factor 3: Substance Use Satisfaction**

Note: Item 2 (Family) loaded on Satisfaction with External Obligations in the present solution whereas in Donohue et al., item 2 loaded on the Social Satisfaction factor. Items 4 (Employment) and 10 (Money and Material Possessions) loaded on Substance Use Satisfaction in the present solution whereas in Donohue et al., item 4 loaded on Satisfaction with External Obligations and item 10 loaded on the Social Satisfaction factor.
### Table 3

*Correlations between subscales of the Changing My Life Scale*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Self-Satisfaction</th>
<th>Intentionality</th>
<th>Need for Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intentionality</td>
<td>.23</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Need for Assistance</td>
<td>-.03</td>
<td>.30*</td>
<td>-</td>
</tr>
<tr>
<td>Self-Assurance</td>
<td>.42**</td>
<td>.35*</td>
<td>.25</td>
</tr>
</tbody>
</table>

*p < .05, 2-tailed.

**p < .01, 2-tailed.
Table 4

**Correlations between scales and subscales of the performance control component of self-regulation**

<table>
<thead>
<tr>
<th>Scale/subscale</th>
<th>Impulsivity</th>
<th>DOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOG</td>
<td>-.03</td>
<td>-</td>
</tr>
<tr>
<td>Mean Go RT</td>
<td>.05</td>
<td>-.30*</td>
</tr>
</tbody>
</table>

Note: Impulsivity = The Impulsivity Scale; DOG = delay of gratification; Mean go RT = average go-signal reaction-time.

** p < .01, 2-tailed.
* p < .05, 2-tailed.
Table 5

Correlations between scales and subscales of the self-reflection component of self-regulation

<table>
<thead>
<tr>
<th>Scale/subscale</th>
<th>SSRQ</th>
<th>LSSPY SS</th>
<th>LSSPY EXO</th>
<th>LSSPY SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSSPY SS</td>
<td>.01</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSSPY EXO</td>
<td>.27</td>
<td>.31*</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>LSSPY SU</td>
<td>-.12</td>
<td>.26</td>
<td>.32*</td>
<td>-</td>
</tr>
<tr>
<td>LSSPY</td>
<td>.29*</td>
<td>.44**</td>
<td>.52**</td>
<td>.08</td>
</tr>
</tbody>
</table>

Note: SSRQ = Short-Form Self-Regulation Questionnaire; LSSPY SS = social satisfaction subscale of Life Satisfaction Scale for Problem Youth; LSSPY EXO = satisfaction with external obligations subscale of Life Satisfaction Scale for Problem Youth; LSSPY SU = substance use satisfaction subscale of Life Satisfaction Scale for Problem Youth; LSSPY = overall life satisfaction.
List of Figures

Figure 1. Short-Form Self-Regulation Questionnaire item example.