Exploration of Treatment Change in Social Problem-Solving, Emotional Regulation, Aggression and Violence Risk in Male Offenders With Cognitive Impairment

Student ID: [redacted]

This report is submitted in partial fulfillment of the degree of

Master of Psychology (Clinical)

School of Psychology

University of Adelaide

October 7, 2022

Word Count: 7890

Abstract

Offender rehabilitation programs aim to reduce re-offending by differentially addressing the unique characteristics of offender groups. The South Australian Violence Prevention Program-me intervention is delivered to male offenders with suspected cognitive impairments at high-risk of violent reoffending. In this study, change following participation in the intervention was assessed in offence-relevant domains of social problem-solving, emotional regulation, aggression and violence risk. Design: With-in subjects pre- to post-treatment change. Method: Nineteen VPP-me participants were assessed for change on measures of social problem-solving, emotional regulation, aggression and violence risk. Results revealed group-level significant change in aggression, violence risk and emotional dysregulation, but not in social problem-solving ability. A minority of participants experienced individual-level reliable change on these outcomes. Conclusion: VPP-me program participation may result in change for violence risk, aggression, emotional dysregulation and social problem-solving for some cognitively impaired male offenders.

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Declaration

This dissertation contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, contains no materials previously published except where due reference is made.

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Month/Year October, 2022

Exploration of Treatment Change in Social Problem-Solving, Emotional Regulation, Aggression and Violence Risk in Male Offenders With Cognitive Impairment

Running Title: Violent Male Offenders with Cognitive Impairment

Student ID: [redacted] (C.R.)[1]

[1]School of Psychology, University of Adelaide

Author Note

This article is intended for submission to the International Journal of Offender Therapy and Comparative Criminology, which adheres to the guidelines of the Publication Manual of the American Psychological Association (7th Edition). At present, the article has been written according to the Master of Psychology (Clinical) thesis requirement of 6,000-8,000 words but will be edited prior to submission to meet the 25 page limit, including figures, tables and references, specified by the International Journal of Offender Therapy and Comparative Criminology.

Statement of Contribution:

C.R. generated the research questions, conducted the literature review, performed all analyses, created all tables, and wrote draft and final manuscripts.

Exploration of Treatment Change in Social Problem-Solving, Emotional Regulation, Aggression and Violence Risk in Male Offenders With Cognitive Impairment

In justice systems worldwide, overrepresentation by people with cognitive impairments is well-acknowledged. Despite recognition of this issue, offenders are rarely formally assessed for cognitive impairments, and little in the way of specialised rehabilitation programming is available. However, in recent decades, advances in offender rehabilitation theory and practice focused on reducing recidivism have led to specialised programs catering for the unique characteristics of offender groups, including those convicted of intimate partner violence or sexual offences. Individuals with cognitive impairments are at increased risk of contact with the justice system due to higher incidence and more severe difficulties with social problem-solving (Li et al., 2016; Lindsay et al., 2011; Wilson Rogers et al., 2018), emotional dysregulation (Farrer & Hedges, 2011; Shields et al., 2016) and aggression (Jansen, 2020; Verberne et al., 2019). In South Australia, a recently developed program, the Violence Prevention Program-me (VPP-me) aims to address the unique needs of male offenders with suspected cognitive impairment, who are at high-risk of violent reoffending. Exploration of changes across the offence-relevant domains of social problem-solving, emotional regulation, and aggression in individuals participating in the VPP-me is warranted and may guide program development in this area.

Prevalence studies in prison populations report higher rates of cognitive impairment in prisoners than in the general community. Rates of intellectual disability and of brain injury are reported to be between 7-20% (Catalano et al., 2020; Fazel et al., 2008; Hellenbach et al., 2017) and 40-60% (Farrer & Hedges, 2011; Schneider et al., 2021), respectively, whereas in the general population, rates are known to be only 1-2% and 8-15% respectively. However, complete assessment and identification of offenders' specific cognitive impairments rarely occurs within correctional systems (de Klerk et al., 2021; Hellenbach et al., 2017). Instead,

prison staff rely on screening measures, partial assessments and clinical judgement to identify offenders more generally as being "cognitively impaired" (Catalano et al., 2020; Garcia-Largo et al., 2020; Hayes, 2019). Therefore, within prison settings, those with intellectual disabilities (ID), autism spectrum disorder (ASD), developmental disabilities, literacy difficulties and acquired brain injuries (ABI) are designated generally as having 'cognitive impairments' when accessing interventions and services (Snoyman et al., 2019).

Domains Related to Risk of Violent Offending

Cognitive impairment is associated with higher prevalence and severity of deficits in the offence-relevant areas of social competency, emotional regulation, and aggressive behaviours (Linden et al., 2020; Lindsay et al., 2011). In efforts to identify likelihood of future criminal conduct and guide intervention efforts, correctional services staff screen and assess incoming offenders using batteries of psychometric scales covering criminal attitudes, personality traits, intelligence, aggression, emotional regulation, impulsivity, social problem-solving and violence risk (Coupland & Olver, 2020). Relevant 'dynamic', or changeable, risk factors are identified, and become treatment targets for rehabilitating offenders, with the intention to prevent recidivism (Bonta & Andrews, 2017; Heffernan et al., 2019; Papalia et al., 2020). Rehabilitation programs developed for violent offenders, like the VPP-me, address multiple treatment targets known to predict likelihood of violent recidivism.

Aggression

Aggression and violence result from multiple interacting processes (Klepfisz et al., 2016). Violence is aggression with extreme harm as its goal, while aggression is any behaviour directed toward others and intended to cause immediate harm that the target is motivated to avoid (Anderson & Bushman, 2002). Therefore, while not all aggression is violent, all violence does originate with aggressive behaviour or affect. This may stem from an individual's social information processing patterns, where aggression is selected to

retaliate against perceived hostility in others, or is selected to achieve desired goals in social situations (Arsenio & Lemerise, 2004; Crick & Dodge, 1996; Lemerise & Arsenio, 2000). In addition, aggressive behaviours are increased at times of negative emotional arousal, potentially regulating unwanted or unrecognised difficult emotions by externalising them (Garofalo et al., 2018). Therefore, social problem-solving and emotional regulation are promising treatment targets for reducing aggressive behaviour, and the resulting violence.

Social Problem-Solving

Social Problem-Solving (SPS) is the self-directed cognitive-behavioural process of identifying effective solutions to problems in everyday life, influencing individuals' adaptive functioning in real-life social environments (D'Zurilla & Maydeu-Olivares, 2004). While cognitive processes are involved, SPS is concerned with the outcome of these processes, the selected behaviour which is then enacted in social contexts (Arsenio & Lemerise, 2004; Crick & Dodge, 1996). Antisocial behaviour, like violence, violates social norms, clearly reflecting deficits in adaptive social problem-solving. Offenders with histories of aggression are found to have more detailed and readily accessible aggressive cognitions, aggressive mental 'scripts' and beliefs supporting aggression within social environments than offenders without aggressive histories (Gilbert et al., 2013).

Studies of SPS have found that negative problem orientation, where problems are viewed as threats to well-being, predicts increased anxiety and depression in adult male offenders (McMurran & Christopher, 2009). In their meta-analysis of 22 studies on violent offender rehabilitation programs, Papalia et al. (2020) found moderate improvement in social problem-solving, trait anger and social skills, though not impulsivity, for mainstream offenders without cognitive impairments, providing support for the effectiveness of programs addressing intermediate dynamic risk treatment targets, such as SPS, in mainstream violent offender populations.

Given the high prevalence of offenders with cognitive impairments, it is important to recognise and provide intervention accounting for these special needs. As one form of cognitive impairment, intellectual disability (ID) is characterised by deficits in problem-solving, moral reasoning and judgement, resulting in impaired adaptive functioning and failure to meet standards of social responsibility (American Psychiatric Association, [APA], 2022). As in offenders without intellectual disabilities, aggression in people with intellectual disability is related to hostile intention bias and aggression-supportive social problem solving styles (Larkin et al., 2013). Additionally, difficulty perceiving fear or anxiety in others relates to aggressive behaviour in offenders with intellectual disability (Wilson Rogers et al., 2018).

Neurocognitive impairment (e.g. brain injury), another form of cognitive impairment, commonly results in social cognition deficits, including behaviours outside the socially acceptable range, insensitivity to social standards, limited ability in recognising social cues, decreased empathy and insight, and behavioural disinhibition (APA, 2022; Arciniegas & Wortzel, 2014; Roberts et al., 2019). Severity of brain injury predicts poorer social cognition, poorer behavioural regulation and increased aggressive behaviours in offenders, potentially due to frustration resulting from strained cognitive functioning in real-time social contexts (Linden et al., 2020). Offenders with acquired brain injuries (ABI) are more likely to have prior convictions than those without ABIs (Jansen, 2020).

Emotional Regulation

Emotional regulation (ER) is defined as "adaptively modulating the experience of emotions, with emphasis on the ability to inhibit inappropriate or impulsive behaviours and behave according to desired goals when experiencing negative emotions" (Gratz & Roemer, 2004). Deficits in ER are dimensional, existing along a continuum from 'none' through 'high emotional dysregulation' (Garofalo et al., 2021). The link between antisocial traits, or psychopathy, aggression, and emotional regulation has been well-supported in recent years.

In their RCT comparing cognitively unimpaired offenders and a community sample in Europe, Garofalo et al. (2021) found that degree of emotional dysregulation mediates the relationship between psychopathy and all dimensions (hostility, anger, physical, verbal) and forms (reactive, proactive) of aggression. In non-impaired violent male offenders, inability to recognise, describe and accept emotions mediates aggression (Garofalo et al., 2018), and frequency of aggressive script rehearsal makes emotional dysregulation more likely (Hosie et al., 2022).

Emotional dysregulation in cognitively impaired individuals is well established as a core feature of various diagnoses, including intellectual disability (ID), acquired brain injury and autism spectrum disorder (ASD). Difficulties in adaptively regulating anger is recognised as relating to aggression within individuals with ID (Taylor & Novaco, 2018; Taylor et al., 2002), while in autistic adults, higher sensory sensitivity predicts higher anger and subsequent aggressive behaviour (van den Boogert et al., 2021). Individuals with brain injuries characteristically display behavioural disinhibition, aggression, irritability, angry outbursts, impulsivity, reduced insight and cognitive inflexibility as well as increased verbal and physical aggression (Arciniegas & Wortzel, 2014; Roberts et al., 2019; Verberne et al., 2019). After TBI, injury-acquired lack of emotional awareness, or alexithymia, has an estimated prevalence of 57-61% and predicts aggression (Williams et al., 2019). In a study exploring emotional distress post-TBI in 50 Australian adults, Shields et al. (2016) found higher emotional dysregulation in brain-injured adults, who displayed difficulties accepting emotions, deficits in emotional regulation strategies, and that emotional dysregulation significantly accounted for variance in depression and anxiety, conditions known to increase aggression in this population (Arciniegas & Wortzel, 2014).

Interventions for People with Cognitive Impairments

To address aggression, emotional dysregulation and social skills deficits experienced frequently by people with cognitive impairments, cognitive behavioural-style psychological interventions have been adapted and assessed for effectiveness.

Meta-analytic evidence supports CBT-style intervention effectiveness for external aggressive behaviours, though not internal anger, in adults with moderate to severe brain injuries (Iruthayarajah et al., 2018). In a recent systematic review, behaviour management techniques and anger management training (in emotional regulation strategies) were identified as the most effective psychological methods to reduce aggression in non-offending brain injured adults (Verberne et al., 2019). A cognitively-focused individual CBT-style trial program for adults with moderate-severe TBI significantly improved emotional awareness and regulation immediately post-treatment. However, though some emotional awareness improvement persisted at 2-month follow-up, emotional regulation change did not (Neumann et al., 2017). Currently, behaviourally-focused interventions are recommended for adults with aggression and emotional regulation problems after brain injury (Arciniegas & Wortzel, 2014; Osborne-Crowley & McDonald, 2018).

Though long believed a fundamentally inaccessible treatment approach for people with ID, CBT as an intervention is now recognised to be an accessible and effective treatment for psychopathology in people with mild to moderate ID, in individual or group formats (Hronis, 2021; Vereenooghe & Langdon, 2013). As with non-cognitively impaired adults, CBT for ID comprises goal setting, thought records for cognitive restructuring work, and monitoring moods to assist emotional regulation (Hronis, 2021). Studies are few, however meta-analyses by Veerenoghe & Langdon (2013) and Graser et al. (2022) report medium significant effect sizes from controlled studies of CBT for anger management (i.e. emotional dysregulation) in people with ID. However, CBT-style intervention is not effective post-TBI

as a treatment approach for social disinhibition, potentially because socially disinhibited behaviour stems not from lack of social knowledge but from a neurological inability to withhold socially inappropriate behaviours (Osborne-Crowley & McDonald, 2018).

Interventions for Offenders

Current practice in correctional psychology is founded on the cognitive and social learning theory that all behaviour is learned, and can be shaped. Many correctional programs worldwide derive from Bonta and Andrews' (2017) Risk-Need-Responsivity Model of offender assessment and treatment. In part, this model stipulates that higher risk of criminal conduct requires more intensive rehabilitation program intervention, designed to be specifically responsive in meeting the unique characteristics of individual offenders. Treatment targets of offender rehabilitation programs are dynamic risk factors (DRF) in which change predicts likelihood of subsequent criminal behaviour (Bonta & Andrews, 2017). Ward (2016) describes DRFs as "psychological and social processes that impair normal functioning, disrupting persons' internal and external relationships to their social, cultural and physical environments". Importantly, for DRFs to be justified as treatment targets, it must be shown these factors are changeable, and that change in them predicts changes in risk (Heffernan et al., 2019; Wong & Gordon, 2006). To best guide violence prevention efforts, there must be consideration of the specific DRF's functional relationships (Klepfisz et al., 2016) and relevance to the individual offender (Heffernan et al., 2019).

Interventions designed to reduce risk of recidivism in non-impaired offenders are effective. Changes in DRFs, and in recidivism, have been reported for non-impaired violently offending adult males completing CBT-style rehabilitation programs in prison (Higgs et al., 2019; Mercer et al., 2022; O'Brien & Daffern, 2017; Papalia et al., 2020; Zhou et al., 2018).

Interventions for Cognitively Impaired Offenders

At present, evidence supporting interventions for cognitively impaired offenders is limited, and programs are primarily designed to address sexual offending or substance abuse (Snoyman et al., 2019). However, evidence suggests that programs for cognitively impaired offenders are most effective when sessions are shorter and held more frequently, presented in simplified language and in highly visual formats. They should include training in emotional awareness and identifying triggers for anger and aggression, and role playing of problem-solving approaches (Didden et al., 2019).

For offenders with intellectual disabilities who exhibit dysregulated anger, CBT-style programs for developing anger management skills are effective (Taylor & Novaco, 2018). Evidence supporting CBT interventions outside of anger management is limited in adults with ID (Ali et al., 2015; Hayes, 2019). However, Oxnam and Gardner (2011) reported statistically significant improvement in rational problem solving after participation in the 42-week adapted CBT-style *Stepping Stones* social problem-solving program for offenders with ID. And, Ashworth et al. (2021) found pre- to post-treatment improvement in interpersonal skills for male forensic patients with ID and comorbid ASD participating in an adapted Dialectical Behaviour Therapy (DBT) program.

The impact of brain injuries on social and emotional functioning is rarely assessed or treated in the general population or in offender groups (Osborne-Crowley & McDonald, 2018; Roberts et al., 2019). Unfortunately, despite the high prevalence of brain-injured offenders in correctional systems, few offender rehabilitation programs address the long-term behavioural and cognitive consequences of ABIs, and nearly no high quality studies exist investigating what works for this subset of ‘cognitively impaired’ individuals (de Geus et al., 2021). Additionally, despite the clear relevance of social problem-solving for cognitively impaired offenders, effective SPS interventions for cognitively impaired offenders are scarce

(Hayes, 2019; Lindsay et al., 2011) and what works for improving SPS in offenders with cognitive impairments remains uncertain (Hayes, 2019; Williams et al., 2018).

Present Study

Although there is widespread agreement and empirical evidence for the high prevalence of offenders with cognitive impairments, for whom specific offence-relevant deficits increase likelihood of contact with justice system, there is lack of research regarding the effectiveness of appropriate interventions designed to reduce reoffending in these individuals. Therefore, the present study aimed to explore group and individual-level change in aggression, social problem-solving (SPS), emotional regulation (ER) and risk of violence in men with heterogenous cognitive impairments taking part in a specialised violence prevention program designed to meet their unique responsivity needs.

Research Questions

1. Given the difficulties of conducting programs in prison-settings, and program effects being routinely modest due to myriad reasons (Day, 2020), this research sought to explore whether there would be statistically significant pre to post-intervention group-level improvements in Social Problem-Solving, Emotional, Aggression and Violence Risk in cognitively impaired violent male offenders completing the VPP-me program.

2. Second, individual-level pre- to post-intervention reliable change in Social Problem-Solving, Emotional Dysregulation, Aggression and Violence Risk in VPP-me participants was assessed.

3. Third, this research sought to explore potential means differences in intellectual ability, cognitive function and number of prior imprisonments (representing recidivism rate before treatment) between VPP-me participants with and without reliable changes in Social Problem Solving, Emotional Regulation, Aggression and Violence Risk total scores.

Method

Participants and Procedure

Participants were 46 adult males aged 19-64 years (*Mean age* = 33.53 years, *SD* = 11.82) incarcerated in South Australian prisons between 2018-2022, with violent offence history and rated as "High Risk" for violent recidivism on the Violence Risk Scale (VRS). See Table 1 for full demographic details. Program participation was voluntary, though offenders were advised unwillingness to engage in rehabilitation programming can affect parole board decisions. Facilitating informed consent, RPU clinicians explained the program, and read the consent form (see Appendix A) with each offender. Of the 46 who commenced, 6 participants withdrew before completion (i.e. when moving prisons), and for 21 participants pre- and post-treatment data were incompletely recorded. As planned analyses required complete pre- and post-intervention data, only the 19 participants who completed the program and had complete data recorded were included in the analyses. Datasets were provided to the researcher with participants coded by non-identifiable Client Number. Ethics approval was received from School of Psychology HREC sub-committee at the University of Adelaide (Approval # 22/05) and from the South Australian Department of Correctional Services (DCS) Research Evaluation and Management Committee (CEN/22/0235).

Data Collection Method

Department of Correctional Services staff conduct assessments to guide individual offender development plans, including rehabilitation program referrals, prison location and security rating. De-identified data for the present study was collected by RPU clinicians as standard procedure for monitoring offender rehabilitation at different time points: cognitive assessment data obtained prior to referral into the program; pre-intervention data gathered at program commencement, and post-intervention data gathered after program completion. Measures were administered in varying ways: completed individually, with clarification

Table 1

Demographic Characteristics of Participants

Program participation ($N = 40$)	Complete Pre- and Post- Scores ($n = 19$)		Missing Scores ($n = 21$)	
	n	%	*n*	%
Age (years)				
18 – 24	3	15.8	2	9.5
25 – 39	13	68.4	15	71.4
40 – 54	2	10.5	3	14.3
55 – 65	1	5.3	1	4.8
Aboriginal or Torres Strait Islander				
Yes	11	57.9	10	47.6
No	8	42.1	11	52.4
Prison Location				
Port Augusta	7	36.8	8	38.1
Mobilong	4	21.1	3	14.3
Mount Gambier	8	42.1	10	47.6
Current Offence Type				
Break and Enter	5	26.3	5	23.8
Robbery	6	31.6	7	33.3
Assault	3	15.8	4	19.0
Homicide	2	10.5	4	19.0
Other	3	15.8	1	4.8
Previous Imprisonments				
1 – 5	10	52.7	8	38.1
6 – 10	7	37.0	7	33.4
11 – 15	2	10.6	4	19.1
Over 16	-	-	2	9.6
Full-Scale IQ Category				
Extremely Low (<69)	8	42.1	8	38.1
Borderline (70-79)	7	36.8	7	33.3
Low Average (80-89)	1	5.3	1	4.8
FSIQ Not Interpretable	2	10.5	2	9.5
GAI Calculated	1	5.3	3	14.3
RBANS Category				
Extremely Low	10	52.6	8	38.1
Borderline	2	10.5	2	9.5
Low Average	1	5.3	-	-
RBANS not administered	6	31.6	11	52.4

offered by staff; read aloud to the offender, with responses recorded by staff; or completed in group format.

Intervention

The Violence Prevention Program-me (VPP-me) was designed to address the need for a rehabilitation program meeting the unique characteristics of cognitively impaired offenders, and began implementation in South Australian correctional facilities in October, 2018. The

VPP-me intervention comprises seven multi-session modules (see Table 2), facilitated by registered psychologists or social workers working from a standardised manual. Sessions are structured and presented to accommodate slower processing, poorer attention and lower literacy levels. Session content is reduced, and conveyed visually as well as verbally. Language is simplified, with key points and summaries repeated throughout and at the end of each session. Group and partner activities and role plays are used, with each participant expected to take part, including sharing personal reflections on ways key session content applies to themselves. Facilitators guide discussions, clarifying when comprehension difficulties occur, and incorporating situations experienced by participants within the prison setting as practical examples to explore together. As in standard CBT interventions, homework is given, but VPP-me participants can seek assistance from their support person between sessions.

The VPP-me program lasts approximately 12 months: 10-11 months of group and individual sessions, then 1 month of community case management and handover prior to release. Group sessions, with between 8-9 participants, occur twice weekly, lasting 2.5 hours each. In addition, individual sessions of approximately 1-hour are offered once per week. To date, there have been five completed VPP-me interventions.

Measures

Cognitive Assessments

Registered psychologists administered the standardised Weschler Adult Intelligence Scale- Fourth Edition (WAIS-IV; Weschler, 2008) to assess level of intellectual functioning. The Repeatable Battery for the Assessment of Neurological Status (RBANS; Randolph, 2012) was used as a screening tool of potential cognitive impairment. Both WAIS-IV Full Scale Intelligence Quotient (FSIQ) and RBANS Total Score use standardised scores, with

Table 2

VPP-me Intervention Program Description

Module	Title	Program Content
1	Get Ready	Socialising participants to the program model, incorporating psychoeducation and group exploration of the sources and effects of violence and aggression. DBT mindfulness and distress tolerance skills taught to increase understanding, awareness and adaptive experience of emotional and physiological of stress.
2	Communication Skills	Emphasising differences between good and bad communication, including listening skills and adaptive ways of expressing oneself, with a DBT "Wise Mind, Risky Mind" perspective.
3	Thinking and Problem Solving	Introducing CBT-model, exploring how thoughts, behaviours and feelings are interconnected and influenced by the situation or environment. As in earlier modules, DBT 'Wise Mind' perspective is used, exploring negative thinking patterns and examining evidence for thoughts.
4	My Feelings	DBT-style exploration and practice of emotion regulation skills, radical acceptance and self-care skills. Anger is primary focus. Emotions are neither good nor bad, but experiences all people have. Wise Mind contrasts with Risky Mind, emphasising individual choice, and adaptive versus maladaptive reactions.
5	Substance Use	Exploring participants' own use and relationship to substances, increasing skills in assertively responding to pressure from others. Emotional regulation skills are taught for responding to urges, coping with high risk situations, including high-stress conditions. Acknowledgement that relapses may occur, as temporary setbacks, rather than complete failure to stop using.
6	Relationships	Exploring how relationships influence choice and behaviour differently, depending on the person and type of relationship, and level of peer pressure or mob mentality being experienced. Relationship effectiveness skills cover healthy and unhealthy relationships, how to handle conflict, and making good choices in relationships.
7	Community Transition	Specially included to meet higher support needs of offenders with cognitive impairments returning to the community. A support network planning meeting takes place between people identified by offenders as supporting a prosocial lifestyle, including family members, support workers, employment services and the community corrections officer.

mean average of 100 and standard deviation of 15. If WAIS-IV highest and lowest Index standard scores deviate more than 1.5*SD*s, FSIQ is not interpretable. When FSIQ is not interpretable, but the Verbal Comprehension Index and Perceptual Reasoning Index deviate less than 1.5*SD*s, the General Ability Index (GAI) may be calculated as a measure of general intelligence (Lichtenberger & Kaufman, 2013)

Both WAIS-IV and RBANS use norm-based descriptive categories: *Average* (90-109), *Low Average* (80-89), *Borderline* (70-79) and *Extremely Low* (≤69). As these measures compare individual cognitive performance against typically functioning adults, norms and descriptors are applicable for the present study, though only the WAIS-IV has been normed with an Australian sample.

Risk Factor Assessments

Social Problem-Solving.

The Social Problem-Solving Inventory-Revised Short-Form (SPSI-R [SF]; D'Zurilla et al., 2002) is a 25-item, 5-factor, 5-point Likert-type (0 = *Not at all true* to 4 = *Extremely true*) self-report measure of ability to solve problems in everyday life, where higher scores relate to better problem-solving ability. The five factors are Negative Problem Orientation (NPO; "*If I fail at first I get frustrated*"), Positive Problem Orientation (PPO; "*I can always solve hard problems on my own*"), Avoidance Style (AS; "*I wait to see if a problem will sort itself out before I do anything*"), Rational Problem Solving (RPS; "*When I have a problem I try to get all the facts first*") and Impulsivity/Carelessness Style (ICS; "*I make decisions on the spur of the moment*"). The RPU uses a simplified, language-adapted version with visual response option (see Appendix B), consistent with Lindsay et al.'s (2011) use with intellectually disabled offenders, where internal consistency was good ($\alpha = 0.84$). Li et al.'s (2016) exploratory factor analysis with TBI participants revealed AS and ICS are not representative of intended constructs in brain-injured populations, recommending only

analysing the PPO, NPO and RPS factors. However, Lindsay et al.'s (2011) factor analysis with an offending intellectually disabled population found good fit for the five-factor model, supporting use with generally cognitively impaired participants in the present study. D'Zurilla et al. (2002) suggest Total Score is appropriate for monitoring change, therefore Total Score means comparison is also appropriate. Raw scores convert to standardised scores, with mean average of 100 and standard deviation of 15. Though no cognitively impaired normative reference sample exists, possible standardised score range is 39-140, and non-impaired norm-based descriptive categories are *Average* (86-114), *Below Average* (71-85), *Very Below Average* (56-70) and *Extremely Below Average* (≤55).

Emotional Dysregulation.

The Difficulties in Emotional Regulation Scale Short-Form (DERS-16; Bjureberg et al., 2016) is a 16-item, 5-point, Likert-type scale (1- *Almost Nev*er to 5- *Almost Always*). It was shortened from the original 36-item (Gratz & Roemer, 2004) version and has excellent fit with the five retained original factors: Goals ("*When I'm upset, I have difficulty getting work done*"), Clarity ("*I am confused about how I feel*"), Strategies ("*When I'm upset, my emotions feel overwhelming*"), Impulse ("*When I'm upset I feel out of control*"), (Non)Acceptance ("*When I'm upset I feel weak*"). Lower scores represent less emotional dysregulation. The DERS-16 presents emotions as functional, focusing on adaptive responses to emotional distress, such as behavioural regulation during negative emotions, use of situationally appropriate strategies in modulating emotions, and level of acceptance of negative emotions as part of normal life. Due to its brevity, the DERS-16 provides a total score and subscales are not calculated when scoring this measure (Burton et al., 2022). It has excellent internal consistency ($\alpha = .93$) and test-retest reliability, as well as good construct and convergent validity.

Aggression.

The Aggression Questionnaire Short-Form (Bryant & Smith, 2001) is a 12-item, 6-point, Likert-type scale (1- *Extremely uncharacteristic of me* to 6- *Extremely characteristic of Me*) measuring aggressiveness across four factors: Hostility ("*I know 'friends' talk about me behind my back*"), Anger ("*I have trouble controlling my temper*"), Physical ("*I have threatened people I know*"), and Verbal ("*My friends say I argue a lot*"). VPP-me participants were administered the full Buss-Warren Aggression Questionnaire (Buss & Warren, 2000), comprised of 34-items, 5-factors, on a 5-point Likert-type scale (1- *Not at all like me* to 5- *Completely Like Me*) with a possible Total Score range of 34-170. However, for the present study, only the 12 items comprising the 4-factor model proposed by Bryant and Smith (2001) were used for analyses, resulting in an AQ-12 Total Score range of 12-60, reflecting the 5-point Likert response options available to participants completing the full AQ. This decision was taken as the AQ-12 is empirically supported to have superior psychometric properties, acceptable Total Score reliability ($\alpha = 0.86$) and better fit with violently offending forensic populations than longer versions of the AQ (Gallagher & Ashford, 2016; Pettersen et al., 2018). Although no version of the AQ has been used in published studies with intellectually disabled individuals (Willner et al., 2019), both long and short AQ versions have been used with forensic and non-forensic groups, in individuals with ABIs, and in pre- to post-treatment evaluation of a Violence Prevention Program in Canada (Pettersen et al., 2018).

Violence Risk.

The Violence Risk Scale (VRS; Wong & Gordon, 2000) is a clinician-administered assessment of risk of violent recidivism, used to monitor treatment-related change in risk level (Klepfisz et al., 2014). It comprises six static (i.e. *Age at first conviction; Stability of family upbringing*) and twenty dynamic (i.e. *Interpersonal aggression; Emotional control;*

Impulsivity) predictors of violence risk, rated on an ordinal scale as *No relationship with violence* (0) through *Consistent and significant relation to violence* (3). Factors rated at 2-3 become treatment targets. Clinicians assess offenders according to the Stages of Change Model (pre-contemplation, contemplation, action, maintenance), qualitatively measuring changes in behaviours, attitudes and affect resulting from program participation (Wong & Gordon, 2003). Levels are categorised as *Low Risk* (0-34), *Moderate Risk* (35-50) and *High Risk* (51-78). Total Score reliability is excellent (α = 0.93).

Planned Analyses

According to current practice in intervention change research, the present study used a single group, within-subjects, pre- to post-treatment approach to evaluate change from before through after participation in the VPP-me program.

First, using SPSS v.28, related samples *t*-tests or nonparametric alternatives were used to measure group level change.

Individual-level reliable change was calculated according to the formulae and interpretive method reported by Klepfisz et al. (2014).

$$RCI = \frac{x_2 - x_1}{S_{diff}}$$

Where x_2 is a participant's post-treatment score, x_1 is that participant's pre-treatment score, and S_{diff} is the standard error of the difference between x_2 and x_1:

$$S_{diff} = \sqrt{2({S_E}^2)}$$

S_E is the standard error of the measurement, calculated by:

$$S_E = SD\sqrt{1 - r_{xx}}$$

SD is the pre-treatment standard deviation, SD is standard deviation for pre-treatment, and r_{xx} is the reported alpha co-efficient of the measure. Reliable change was calculated for AQ-12 Total Score, DERS-16 Total Score, SPSI-R (SF) Total Score and VRS Total Score.

Regarding interpretation, participants achieving ≥1.96 Reliable Change Index (RCI) score towards improvement were deemed as demonstrating reliable change, whereas those achieving ≤1.96 or reliable change away from improvement were classified as not achieving reliable change.

Lastly, to explore potential differences in pre- to post-program change related to the individual characteristics of intelligence level, cognitive impairment level and number of prior imprisonments (representing recidivism rate before treatment), comparison of mean differences on these variables was made between participants with reliable change (Group 1) and those without (Group 2).

Results

Preliminary Data Cleaning

Prior to analyses, data was checked visually for missing values. Participants (n = 21) for whom post-intervention data were not recorded were excluded from analyses, as were participants (n = 6) who withdrew before program completion. Though one participant who withdrew completed the program individually, and pre- and post-scores were recorded, the program delivery change prevented comparison with those completing the group program. Comparison of participants with complete pre- and post-intervention data and those without (presented in Table 1) revealed little difference between groups across all major demographic variables. Therefore, participants with complete data (n = 19) were believed to be broadly representative of all participants who engaged in the VPP-me program (n = 46).

For participants with single-item missing data (n = 5), item-mean response was imputed.

Descriptive Statistics

Descriptive statistics for all study variables are presented in Table 3.

Table 3

Descriptive Statistics for Variables

Measure	Possible Range	Pre-Program			Post-Program		
		n	*M*	*SD*	*n*	*M*	*SD*
AQ-12	12 – 60	19	25.74	9.06	19	19.47	6.67
DERS-16	16 – 80	19	38.89	15.13	19	28.12	6.66
SPSI-R (SF)	39 – 140	19	96.84	12.93	19	103.42	13.02
VRS Total	0 – 78	19	57.81	5.20	19	51.51	5.99

Pre- to Post-Intervention Means Comparisons

Social Problem-Solving

When conducting the Wilcoxon signed-rank test, difference scores were not approximately symmetrical, determined by visual inspection of the histogram. Therefore, an exact sign test was conducted to assess the effect of the VPP-me program participation on self-reported overall social problem-solving ability. Pre- and post-treatment SPSI-R (SF) scores were available for 19 participants. Of these, overall social problem-solving ability increased after program participation for 13 participants, whereas five reported reduced overall problem-solving ability and one reported no change. There was no statistically significant improvement in social problem-solving ability (*Mdn* = 2.0) after program participation (*Mdn* = 104.00) compared to before program participation (*Mdn* = 99.00), p = .096.

Paired samples *t*-tests for individual SPSI-R factor results are reported in Table 4. There were no statistically significant mean differences from pre- to post-intervention on Positive Problem Solving, Negative Problem Solving, Rational Problem Solving, Avoidance Style or Impulsivity/Carelessness Style factors.

Table 4

Comparison of Mean Differences on Social Problem-Solving Inventory (Revised) Factors

SPSI-R Factors	Pre-Program	Post-Program	*t(df)*	*p*	Cohen's *d*
	M (SD)	*M (SD)*			
PPO	101.68 (17.99)	99.21 (12.86)	0.55 (18)	.592	.13
NPO	98.53 (13.28)	96.47 (13.44)	0.62 (18)	.545	.14
RPS	98.21 (22.06)	106.95 (12.40)	-1.72 (18)	.102	-.40
AS	102.11 (12.89)	96.05 (14.50)	1.70 (18)	.107	.39
ICS	106.74 (19.08)	97.53 (15.83)	1.83 (18)	.083	.42

Note. PPO = Positive Problem Orientation; NPO = Negative Problem Orientation; RPS = Rational Problem Solving; AS = Avoidance Style; ICS = Impulsivity/Carelessness Style. SPSI-R (SF) Descriptors: 56-70 = *Very Below Norm Group Average*, 86-114 = *Norm Group Average*, 115-129 = *Above Norm Group Average*. Higher than average standard scores on PPO and RPS indicate good problem solving abilities; higher than average standard scores on NPO, AS and ICS indicate dysfunctional problem solving.

Emotional Dysregulation

A Wilcoxon signed-rank test was conducted to assess the effect of the VPP-me program participation on self-reported emotional dysregulation. The difference scores were approximately symmetrical, determined by visual inspection of the histogram. Pre- and post-treatment DERS-16 scores were available for 19 participants. Emotional dysregulation was lower after program participation for 14 participants, whereas four had increased emotional dysregulation and one reported no change. There was a statistically significant decrease in emotional dysregulation (*Mdn* = 5.0) from pre- (*Mdn* = 31.00) to post-treatment (*Mdn* = 29.00), $z = 2.35$, $p = .019$. This was a large effect, $r = 0.54$.

Aggression

A Wilcoxon signed-rank test was conducted to assess the effect of the VPP-me program participation on self-reported aggression. Difference scores were approximately symmetrical, determined by visual inspection of the histogram. Of the 19 participants for whom AQ-12 pre- and post-scores were available, aggression was lower after program participation for 15 offenders, whereas three offenders reported increased aggression and one

reported no difference. There was a statistically significant median decrease in aggression (*Mdn* = 4.0) from pre- (*Mdn* = 24.00) to post-treatment (*Mdn* = 17.00), $z = 2.64$, $p = .008$. This was a large effect, $r = 0.61$.

Violence Risk

A paired-samples *t*-test was used to determine any statistically significant mean difference in total violence risk from pre- to post-VPP-me participation. There were no outliers, and assumption of normality was met. Participants showed lower mean violence risk after the VPP-me program (*Mean* = 51.51, *SD* = 5.99) than before the program (*Mean* = 57.81, *SD* = 5.20). There was a statistically significant mean decrease in violence risk, *M* = 6.30 (*SD* = 2.34), $t(18) = 11.72$, $p < .001$, $d = 2.99$. This was a large effect.

Reliable Change

Complete results for each participant are displayed in Table 5.

Social Problem-Solving

Four participants (21.05%) achieved statistically significant reliable change (RCI ≥ 1.96) towards increased social problem-solving ability, whereas 14 participants (73.69%) did not achieve reliable change, and one participant (5.26%) had no change.

Emotional Dysregulation

Eight participants (42.11%) achieved statistically reliable change (RCI ≥ 1.96) towards decreased emotional dysregulation, whereas nine (47.37%) did not achieve reliable change, one participant (5.26%) had no change, and one participant (5.26%) had reliable change towards increased emotional dysregulation (RCI = -2.65).

Aggression

Four participants (21.05%) achieved statistically reliable change (RCI ≥ 1.96) towards reduced aggression, whereas 13 participants (68.43%) did not achieve reliable

Table 5

Participant Change Across Measures

Measure	AQ-12			DERS-16			SPSI-R (SF)			VRS		
	Pre	Post	RCI	Pre	Post	RCI	Pre	Post	RCI	Pre	Post	RCI
High Security												
Participant 1	16	14	0.42	53	21	5.64*	94	95	0.14	65.00	55.00	5.56*
Participant 2	14	18	-0.83	25	34	-1.59	111	109	-0.27	61.00	52.00	5.00*
Participant 3	20	13	1.46	42	29	2.29*	99	124	3.14*	56.00	49.00†	3.89*
Participant 4	25	27	-0.42	29	34	- 0.88	92	89	-0.41	62.00	57.00	2.78*
Participant 5	21	19	0.41	31	30	0.18	85	90‡	0.68	54.00	46.00†	4.44*
Participant 6	19	15	0.83	26	25	0.18	109	114	0.68	51.00	42.00†	5.00*
Participant 7	14	13	0.21	27	22	0.88	116	112	-0.55	60.00	56.00	2.22*
Medium Security												
Participant 8	29	15	2.92*	26	20	1.06	101	104	0.41	65.52	64.50	0.57
Participant 9	15	15	0.00	22	24	-0.35	87	89	0.27	51.00	45.50†	3.06*
Participant 10	25	22	0.63	30	27	0.53	104	112	1.09	66.00	59.00	3.89*
Participant 11	41	13	5.84*	57	19	6.70*	99	126	3.69*	56.16	49.50†	3.70*
Participant 12	22	33	-2.29°	27	42	-2.65°	88	89	0.14	58.25	50.44†	4.34*
Participant 13	33	27	1.25	67	30	6.52*	69	83‡	1.91	58.00	50.50†	4.17*
Participant 14	38	24	2.92*	50	38	2.12*	92	94	0.27	55.12	46.50†	4.79*
Participant 15	42	13	6.05*	63	23	7.05*	104	123	2.60*	54.26	47.79†	3.59*
Participant 16	23	14	1.88	32	20	2.11*	105	100	-0.68	53.04	49.00†	2.24*
Participant 17	31	29	0.42	38	35	0.53	106	104	-0.27	51.00	45.00†	3.33*
Participant 18	24	17	1.46	30	30	0.00	109	109	0.00	55.12	52.50	1.45
Participant 19	37	29	1.69	64	33	5.47*	70	99‡	4.04*	66.00	61.50	2.50*

Note. * = Significant Reliable Change at ≥1.96; ° = Statistically significant in negative direction; ‡ = Change in Social Problem-Solving category; † = Change in Violence Risk Category. **AQ-12**: Range = 12-60, midpoint 36 (Lower scores = Less Aggression); **DERS-16**: Range = 16-80, midpoint 48. (Lower scores = Less Emotional Dysregulation); **SPSI-R (SF)**: 56-70 = *Very Below Norm Group Average*, 86-114 = *Norm Group Average*, 115-129 = *Above Norm Group Average*; **VRS**: 0-34 = *Low Risk*, 35-50 = *Moderate Risk*, 51-78 = *High Risk.*

change, one participant (5.26%) had no change, and one participant (5.26%) had reliable change towards increased aggression (RCI = -2.29).

Violence Risk

In total, 17 participants (89.47%) achieved statistically reliable change (RCI $\geq$ 1.96) towards reduced violence risk, whereas two participants (10.53%) did not achieve reliable change. Of the 17 participants with statistically significant reliable change, 10 of the 12 in medium security and all seven in high security achieved statistically significant reliable change in violence risk from pre- to post-intervention. For 11 of the 17 participants (64.71%) with statistically reliable reduction in violence risk, this represented a clinical change from High Risk to Moderate Risk of violent recidivism, as determined by assessment on the VRS.

Comparison of Participants With and Without Reliable Change

Finally, exploration of potential differences between participants with and without statistically reliable change in the direction of improvement was undertaken.

Regarding differences between participants in High Security versus Medium Security, there were differences noted in how much reliable change occurred. Of the four participants with reliable change in Social Problem Solving, three were in medium security, and one was in high security. Of the eight participants with reliable change in Emotional Dysregulation, six were in medium security, and two were in high security. All four participants with reliable change in Aggression were in medium security prisons.

Participant demographics of interest for comparison of reliable change included intellectual ability (measured by WAIS-IV Full-Scale IQ; FSIQ), level of cognitive impairment (measured by RBANS Total Score) and number of previous imprisonments when referred into the VPP-me intervention. However, as only two participants did not achieve statistically reliable change on the Violence Risk Scale (VRS), means comparison with the 17 participants with reliable change did not proceed. See Table 6 for complete results.

Table 6

Comparison of Mean Differences of Reliable Change and No Reliable Change by Demographic Characteristic Variables

Variables	Reliable Change	No Reliable Change	*t(df)*	*p*	Cohen's *d*
	M (SD)	*M (SD)*			
Full-Scale IQ					
SPSI-R (SF)	69.33 (9.29)	69.54 (4.75)	-0.06 (14)	.955	-.036
DERS-16	68.68 (6.26)	70.00 (5.05)	-0.41 (14)	.692	-.204
AQ-12	69.25 (8.46)	69.58 (4.56)	-0.10 (14)	.920	-.059
RBANS					
DERS-16	69.25 (11.56)	60.00 (10.94)	-1.39 (11)	.193	.832
AQ-12	60.50 (12.02)	63.27 (11.99)	-0.30 (11)	.769	-.231
Number of Prior Imprisonments					
SPSI-R (SF)	4.25 (4.27)	6.00 (2.82)	-0.99 (17)	.335	-.559
DERS-16	4.25 (2.87)	6.64 (3.04)	-1.73 (17)	.102	-.803
AQ-12	2.75 (2.36)	6.40 (2.90)	-2.31 (17)	.034*	-1.30

Note. * = significant at $p > .05$

Full-Scale Intelligence Quotient

Sixteen participants had FSIQ scores available. To compare FSIQ means between participants with reliable change and those without, independent samples *t*-tests were conducted for Social Problem-Solving, Emotional Dysregulation and Aggression. For all independent samples *t*-tests, normality of distribution was met as assessed by Shapiro-Wilk tests ($p > .05$), and assumption of homogeneity of variances was met as assessed by Levene's tests ($p > .05$). No statistically significant mean differences in FSIQ were found between those with reliable change and those without reliable change on social problem-solving, emotional dysregulation or aggression.

Repeatable Battery for the Assessment of Neurological Status

Thirteen participants had RBANS Total Scores available. Although there were four participants with statistically significant reliable change in social problem-solving, only one had an RBANS Total Score recorded. Therefore, no further statistical analysis was possible with SPSI-R (SF). To compare means between participants with reliable change and those without, independent samples *t*-tests were conducted for Emotional Dysregulation and Aggression. Normality of distribution was met, as assessed by Shapiro-Wilk tests ($p > .05$), and assumption of homogeneity of variances was met, as assessed by Levene's tests ($p > .05$). No statistically significant mean differences in level of cognitive impairment were found between those with reliable change and those without reliable change on emotional dysregulation or aggression.

Number of Prior Imprisonments

All 19 participants had prior imprisonment data available. To compare means between participants with reliable change and those without, independent samples *t*-tests were conducted for Social Problem-Solving, Emotional Dysregulation and Aggression. Normality of distribution was met, as assessed by Shapiro-Wilk tests ($p > .05$), and

assumption of homogeneity of variances was met, as assessed by Levene's tests ($p > .05$). No statistically significant mean differences in number of prior imprisonments were found between those with reliable change and those without reliable change on social problem-solving or emotional dysregulation. However, there was a statistically significant mean difference ($t = -2.31$, $p = .034$) in number of prior imprisonments between those with reliable change and those without reliable change in aggression. This was a large effect ($d = -1.30$).

Discussion

Group-level statistically significant decreases in emotional dysregulation, aggression and violence risk were found, all with large effect sizes, for male violent offenders with cognitive impairments participating in the VPP-me program. At an individual-level, ost participants included in analyses showed reliable change in risk of violent recidivism, less than half in emotional regulation, and a minority for problem solving and self-reported aggression. Interestingly, the clinician-reported measure of risk assessment shows more change than the self-report scales. However, there was no statistically significant group-level change in either social problem-solving overall, nor at the factor level. Individual-level inspection of treatment change revealed that 21.05% participants achieved statistically reliable improvement in social problem-solving ability, 42.11% achieved statistically reliable reduction in emotional dysregulation, 21.05% achieved statistically reliable reduction in aggression, and the majority of participants (89.47%) achieved statistically significant reduction in violence risk. For 64.71% of VPP-me participants with statistically reliable reduction in violence risk, this represented a clinical change from High Risk to Moderate Risk of violent recidivism. Finally, regarding whether individual characteristic differences were associated with reliable change, it was revealed those with fewer number of prior imprisonments had statistically significantly more reliable reduction in aggression than those with more prior imprisonments. There were no statistically significant differences in

intelligence level or cognitive impairment level for those with and those without reliable change in social problem-solving, emotional dysregulation or aggression.

Social problem-solving was the only offence-relevant area not to show statistically significant change at the group level, consistent with Langdon et al.'s (2013) findings where no overall change in social problem solving occurred for offenders with IDs who participated in an intensive rehabilitation program. Contrary to Lindsay et al.'s (2011) study of intellectually disabled offending males, where group means rose from "Below Average" at pre-intervention to "Average" at post-intervention, in the present study participant SPSI-R means were in the "Average" range both at pre- and post-intervention. Interestingly, no difference was found in intellectual ability, cognitive impairment level or prior imprisonments between those who experienced significant change in social problem-solving and those who did not, and change occurred in similar proportion in high and medium security settings. However, examination of individual participants' pre-treatment SPSI Total Scores in Table 5 reveals three participants scoring "Very Below Average" or "Below Average" at pre-intervention. These three who scored as most in need of social problem-solving improvements all made statistically significant reliable change, with post-treatment SPSI-R (SF) scores rising to Below Average or Average range after participation, similar to Lindsay et al.'s (2011) group-level findings. This meant that at program completion, only one participant had less than Average social problem-solving, and significant improvements in this risk factor were achieved by those with greatest pre-intervention deficits.

That participants in the present study overwhelmingly reported social problem-solving ability in the Average range prior to involvement in the VPP-me program requires consideration. The SPSI-R (SF) normative samples used for standardising scores were US-based university psychology students and community-dwelling adults from various social, civic and religious groups. That all but one of the current sample of Australian violent male

offenders with cognitive impairments fell into the normative sample's "Average" range for social problem-solving skills at pre- and post-treatment was an unexpected finding. The recognised lack of self-awareness of deficits common for people with cognitive impairments (Arciniegas & Wortzel, 2014) could account for such unexpected findings on a self-report measure. Additionally, conducting assessments within prison settings often means limited ability to adhere to standardised administration procedures, potentially compromising validity of results (Vanderhoff et al., 2011). D'Zurilla et al. (2002) specify that SPSI-R administrators must beware of unintentionally biasing respondents by making leading comments when clarifying instructions, and when reading the measure aloud using extreme caution to avoid inadvertently reinforcing responses or emphasising the importance of certain answers. As some participants in the present study completed measures in groups, and others had all items read aloud to them, the possibility that results contain some inadvertent contamination from administration may also explain the unexpected finding that cognitively impaired offenders were found to have average social problem-solving skills prior to VPP-me participation. Alternatively, the possibility exists that participants engaged in socially desirable responding on this self-report measure, providing an inaccurate baseline at pre-treatment, in order to present themselves more favourably to corrections staff monitoring their functioning, a drawback noted for the SPSI-R (Bothamley & Tully, 2018). Consistent with Wilson-Rogers et al. (2018), the present study found intellectual ability was not significantly related to reliable change in social problem-solving ability in intellectually disabled offenders.

The significant reduction in emotional dysregulation, with large effect size at a group level, found at an individual level for nearly half of participants, was an encouraging finding, indicating potential success of the VPP-me group program to improve emotional regulation ability for cognitively impaired violent male offenders. As the VPP-me program used a

DBT-style emotional regulation skill learning approach, focusing primarily on regulating anger, this finding supports the potential effectiveness of using this approach in rehabilitation programs for cognitively impaired offenders, meeting Bonta and Andrews' (2017) principle of specific responsivity to unique offender characteristics. This is in contrast to Ashworth et al. (2021) finding no significant effect of the DBT-based emotional regulation program, *I Can Feel Good*, for intellectually disabled adults exhibiting aggressive behaviours. In the present study, no significant differences in intellectual ability, cognitive impairment or number of prior imprisonments were identified between those with reliable change and those without in emotional regulation ability. Yet, as with social problem-solving, consideration of participant pre-intervention scores is worthwhile. Inspection of Table 5 reveals that all participants with no reliable change had scored lower than the DERS-16 mid-point at pre-intervention, whereas all but one participant with reliable change had scored above the mid-point for emotional dysregulation prior to the VPP-me program. Importantly, this shows reliable change occurred in participants with the highest self-reported emotional dysregulation prior to intervention, where most improvement was possible. At post-intervention, one participant reported emotional dysregulation approaching the midpoint. This represented an increase from pre-intervention, though reasons for negative change in this one participant, who had similar negative reliable change in aggression, are not determinable in the present study.

Connecting emotional dysregulation, primarily anger, with aggression, the present study also found a statistically significant and large effect size group-level reduction in aggression from pre- to post-intervention, another encouraging finding. This was consistent with Aboulafia-Brakha et al. (2013), where group CBT-intervention focused on anger management significantly lowered aggression in non-offending adults with TBIs, measured on the AQ-12. However, in the present study, rate of reliable change towards improvement

amongst participants was lower for aggression, at 21.05%, than for emotional regulation, at 42.11%, and no high security participants reported any reliable change in aggression. Inspection of individual pre-treatment scores in Table 5 reveals that all seven high security participants self-reported themselves very close to the lowest possible AQ-12 Total score. Fewer than half of the 12 medium security participants scored close to or above the midpoint for aggression at pre-intervention. At post-intervention, twelve of the nineteen participants were close to the lowest possible score for aggression, indicating close to no physical or verbal aggression, close to no anger and close to no hostility. Only three participants with significant reliable change towards improvement in aggression also had this change in emotional dysregulation. Again, as with social problem-solving, that the majority of cognitively impaired violent male offenders had pre-intervention aggression scores approaching adaptive levels is surprising. This raises questions around measure administration issues contaminating results, and socially-desirable responding on a measure with high face validity such as the Aggression Questionnaire. While the AQ-12 has been validated for use with non-cognitively impaired violent offenders (Gallagher & Ashford, 2016; Higgs et al., 2020; Pettersen et al., 2018), brain-injured non-offenders (Aboulafia-Brakha et al., 2013) and brain-injured offenders (Jansen, 2020), to date it has not been used with intellectually disabled offenders (Willner et al., 2019). Although offenders in the present study are designated generally as “cognitively impaired”, intellectual ability for all ranged from Extremely Low to Borderline. The validity with offenders with low intellectual functioning for any version of the Aggression Questionnaire has not been established, and may have contributed to unexpected findings.

Yet this study identified a significant difference in number of prior imprisonments related to reliable change on aggression, indicating that those without reliable change on aggression had more prior imprisonments. Change in aggression was less after the VPP-me

rehabilitation when an offender had experienced imprisonment more often, potentially suggesting that higher existing recidivism relates to less changeability in aggression, at least in cognitively impaired male offenders. Regarding aggression and recidivism, Higgs et al. (2020) found lower AQ scores predicted lower general recidivism at three year follow-up after the Canadian Violence Prevention Program for non-impaired male offenders.

There were differences in how much reliable change occurred between participants in High Security versus Medium Security on the offence-relevant domains investigated. More reliable change was found in participants located in medium security prisons, suggesting some difference in ability to improve related to prison setting. Potentially, increased opportunity to practice skills learned in the VPP-me program is possible in medium security prisons, where offenders are able to interact more freely with others. Offenders are assigned to prison locations based on individual factors, including usual place of residence, where family members live, any protection issues and prison location of any known enemies. However, as such factors were beyond the scope of the present research, differences in reliable change based on prison location remain unclear.

Recent research on correctional rehabilitation change encourages caution when using self-report measures for pre- to post-treatment change related to dynamic risk factors, recommending clinician-rated measures like the Violence Risk Scale (VRS; Higgs et al., 2020). The VRS is the gold-standard, clinician-rated measure of risk of violent recidivism, not subject to socially-desirable responding biases or confounds due to cognitive impairment. Therefore, the present finding that 89.47% participants were deemed by correctional clinicians to have significantly reduced risk of violent recidivism after completing the VPP-me program is important. For eleven participants, risk-level reduced from High to Moderate. Overall, significant reliable change in risk was identified in all high security participants, and ten of the twelve medium security participants. That this violence risk change occurred in

more participants than did change in aggression contrasts findings by Higgs et al. (2020) and Polaschek et al. (2010) with non-cognitively impaired male offenders at high risk of violent reoffence who had completed intensive violence prevention programs, where the AQ and VRS dynamic factors were correlated, and mirrored each other on pre- to post-intervention change.

Strengths and Limitations

The present study contributes uniquely towards the limited empirical research into prison-based rehabilitation programs for cognitively impaired violent male offenders by considering reliable change connected with a specialised violence prevention program developed to address specific responsivity needs in social problem-solving, emotional regulation, aggression and violence risk. This is also first known study reporting use of the AQ with offenders identified as having impaired intellectual ability, contributing uniquely to aggression research with this population.

However, certain limitations must be acknowledged. First, less than half of all VPP-me participants had complete pre- and post-intervention data available, restricting analysis of treatment changes to only 19 offenders. Though these 19 participants appeared to be broadly representative of all participants who engaged in the VPP-me program, having complete data available for all participants would have provided the most accurate picture of treatment change related to VPP-me participation. Next, given the potential for all offenders to engage in socially-desirable responding, this study would have benefited from inclusion of deception measure data, which may have shed light on unexpected pre-treatment baseline findings. Yet, given that people with cognitive impairments frequently lack personal insight, a self-reported measure of deception could lack validity in this offender population. Additionally, lack of thorough assessment of participants' specific cognitive impairments limited the present study's ability to consider differences in treatment change at the level of brain injury

versus intellectual disability or other cognitive impairment, a worthwhile goal for future studies to consider regarding offender rehabilitation with this population. The variation in administration of psychometric measures between participants likely limited reliability of participant responses on these measures. As is common with prison-based studies of this nature, no control group was used, limiting conclusions about what change resulted directly from participation in the VPP-me program, and what change may have occurred due to other factors existing between pre- and post-treatment assessments. Finally, the present study used pre- and post-treatment data only, as follow-up data are not yet available. Therefore lasting changeability in social problem-solving, emotional regulation, aggression and violence risk and any related recidivism is not known. Future studies would benefit greatly by employing an approach that includes full cognitive and intellectual assessment batteries to identify specific disability type, using standardised administration practices of psychometric measures with all participants, using a comparison control group, and reporting longer-term change and recidivism from post-intervention through to follow-up with participants.

Conclusion

This study finds some evidence that VPP-me program participation produces desirable changes for those participants with greatest deficits in social problem-solving and aggression. The higher rate of improvement in emotional regulation amongst participants indicates a potential strength of DBT-style program elements when rehabilitating violent male offenders with cognitive impairments. Overall, the finding that nearly all VPP-me participants experienced reduction violence risk indicates a necessary strength for a program such as this, tasked with the overarching goal of reducing likelihood of future violent offences in its participants. Though findings are preliminary, they point towards the VPP-me program providing adequate responsivity to unique characteristics of cognitively impaired violent male offenders engaging in intensive prison-based rehabilitation. This is a highly

relevant contribution, given the high prevalence of cognitive impairments within offender populations worldwide, for whom few interventions have been developed or implemented to date.

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Appendix A

Consent Form for Participation in the VPP-me Program

OFFICIAL: Sensitive

Government of South Australia
Department for Correctional Services

CONSENT TO PARTICIPATE
VIOLENCE PREVENTION PROGRAM – ME (VPP-me)

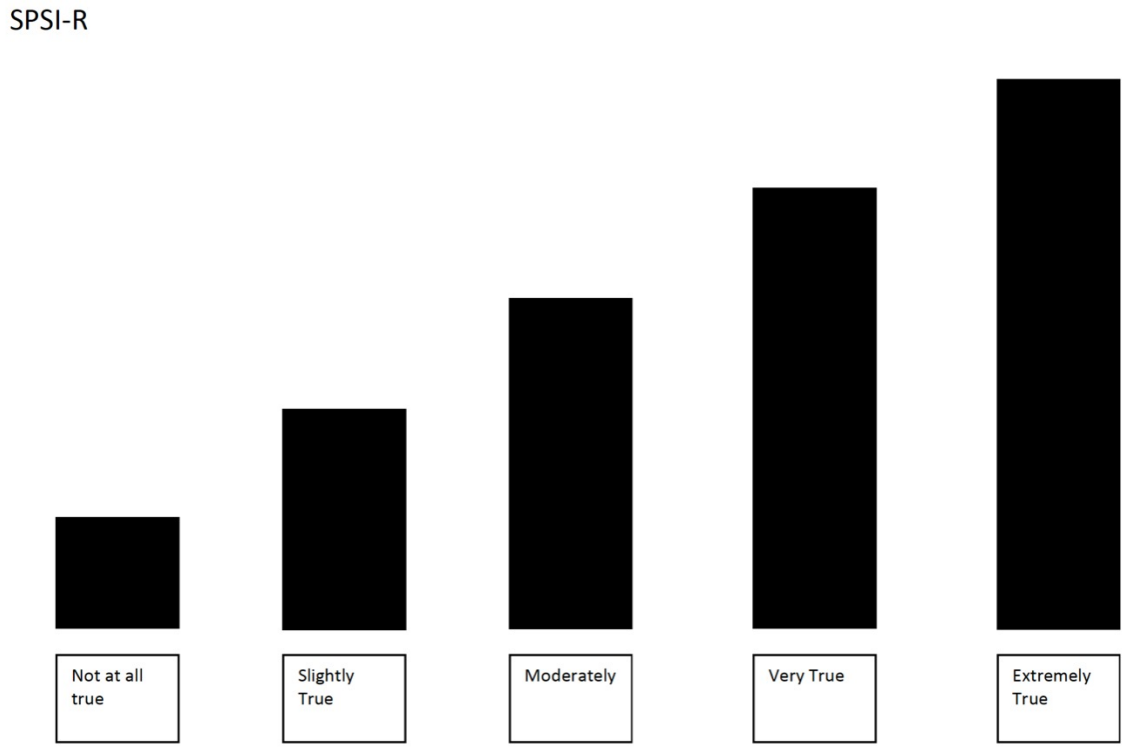
(THIS CONSENT IS VALID FOR 12 MONTHS)

1. I, _____, (DOB) ___ / ___ / ___ DCS ID Number _____
understand that I am being offered a possible opportunity to participate in the **Violence Prevention Program - me** (VPP-me), Port Lincoln Prison.
2. I have read, or have had explained to me, the details in the Violence Prevention Program brochure, and the Extended Supervision Order (ESO) brochure.
3. I understand the limits of confidentiality for program participants and that should I be at risk of self-harming, or harming others this information will not be kept confidential. I understand that if I choose to disclose information relating to any offences, including those against a child which have not been reported, past and present, this will not be kept confidential. If I am accepted into the program, I agree to maintain the confidentiality of group discussions.
4. I understand that I do not have to participate in the program.
5. I understand that, if I refuse to be assessed for the program or participate in the program, my refusal will be noted, and that this information will be provided to relevant statutory bodies, for example, the Parole Board. I understand that the Parole Board expects individuals to satisfactorily complete the program *if* they are offered the opportunity to participate, and are assessed as suitable for the program.
6. I consent to the program being videotaped for evaluation and training purposes. I also understand that a professional observer may be present at some point during the course of the Program.
7. I understand that reports about my participation and performance in the program will be provided to the relevant bodies, for example, the Parole Board.
8. I understand that I will be expected to complete individual assessments before and after the program to determine areas of need and to monitor changes. Program evaluation will also involve the possibility of being randomly selected for an interview, but if selected, my details will not be identified.
9. I understand that I will be expected to contribute to group exercises and discussions as well as individual exercises, to complete homework assignments and discuss my past and current offences. I understand that repeated unauthorised absences, disruption of the group, failure to complete personal assignments or breach of group confidentiality may result in suspension or removal from the program.
10. I understand that on the completion of the program my Self-Management Plan will be forwarded as a working document to relevant parties (i.e. Case Manager) and that this will be referred to throughout my supervision.

cont .... /pg2

Appendix B

Social Problem Solving Inventory- Revised Visual Response Option



Acknowledgements

Firstly, thanks and deep appreciation goes to my University of Adelaide supervisor, Dr [redacted]. His knowledge, insight and guidance in conducting correctional psychology research has been invaluable. I have benefited greatly from his direction to improve the project and written product along the way, and from his patience in providing feedback. Secondly, thanks to [redacted], my South Australian Department of Correctional Services supervisor, for her knowledge and guidance in the particulars of the DCS Rehabilitation Programs Unit, and broadening my understanding of psychological assessments and interventions within correctional contexts.

Thank you to [redacted] for providing details and clarification of the VPP-me development and implementation since it began in 2018, and for providing perspective on the practicalities of running the program. Thank you to [redacted] and [redacted] for their work in accessing and collating all of the data, and de-identifying it, as well as for continued willingness to contribute to discussions of VPP-me intervention and DCS practices.

Lastly, my never-ending thanks to my family, who have again stood by me while I completed research and spent endless hours working to produce this final product. The love, support, encouragement and patience you've all provided have gotten me through. As always, thank you for being my 'soft place to land'.

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3. A running head should be placed on the title page.

4. Include an abstract of no more than 150 words.

5. Use endnotes rather than footnotes.

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7. Each element of the manuscript (title page, abstract, author's notes, appendix, endnotes, references, each table, and each figure) should begin on a new page.

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