THE ROLE OF PERSONALITY FACTORS IN CHILDHOOD TRAUMATIC EVENTS' IMPACT ON TREATMENT PROGRESS

BY

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Abstract

Attrition rates in rehabilitative programmes for violent behaviour are concerning as exiting from treatment may have implications for individuals (e.g., further offending, diminished quality of life), the organisation providing the treatment (e.g., cost, ineffectiveness), and for the society (e.g., safety, trust in the criminal justice system). Therefore, it is necessary to consider factors that may hinder the progress and completion of the treatment of violent offending. This study aimed to extend Te Hiwi's (2020) findings on negative relationship between childhood traumatic events and treatment outcomes, by exploring the role of maladaptive personality traits in this relationship. The study was based on retrospective, file-based data of 417 men who attended the high-intensity rehabilitation programme in New Zealand. Binomial and logistic regression models predicting treatment progress and outcome as well as a structural equation model showed that maladaptive personality traits – antisocial, borderline, and psychopathic – had overall no significant role in the relationship between trauma and treatment progress, despite men who were high on psychopathic traits being less likely to complete the treatment. Traumatic childhood events had a negative impact on treatment progress. In addition, treatment progress in the presence of all types of trauma was a less frequent pattern configuration than statistically expected. These findings reiterate the need for further research on the underlying mechanisms in the relationship between childhood trauma and treatment of violent offending, and self-regulation was suggested as one such mechanism.

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Table of Contents

List of Tables

List of Figures

List of Appendices

The Role of Personality Factors in Childhood Traumatic Events' Impact on Treatment Progress

Attrition rates in rehabilitative programmes for violent behaviour are concerning because the literature suggests that people who fail to complete such programmes may be at a greater risk of reoffending compared to those who never receive treatment (McMurran & Theodosi, 2007; Olver et al., 2011). In such cases, treatment may be considered ineffective for some participants. Exiting from treatment may have implications for individuals, (e.g., further offending, diminished quality of life), the organisation providing the treatment (e.g., cost, ineffectiveness), and for the society (e.g., safety, trust in the criminal justice system). Therefore, it is necessary to consider factors that may hinder the progress and completion of the treatment of violent offending. This study aims to explore the relationship between childhood trauma and treatment progress, taking maladaptive personality traits into account.

Treatment of Violent Offending

Individuals who have a history of violent offending are commonly considered to be at a high risk of reoffending (Nadesu, 2009; O'Brien & Daffern, 2017). Nadesu (2009) reported that, of those individuals who have already been imprisoned for violent offences, 64% were re-imprisoned for another violent offence within a 60-month period. Considering this and the severity of harm violence can cause, the individuals are viewed as high-risk and are therefore eligible for the most intensive treatment (Bonta & Andrews, 2017).

In New Zealand, rehabilitation of high-risk violent offending entails a 9-month treatment which, based on multifactorial etiological formulation, includes structured individual therapy sessions as well as group-based modules (Wilson & Tamatea, 2013).

Special Treatment Unit Rehabilitation Programme (STURP) is one of the highest performing rehabilitation programmes in New Zealand's correctional system with a reduction in reoffending rates reported at 13% (Department of Corrections, 2019). However, aligned with the international reoffending rates, the reduction is still modest at best (Day et al., 2020). This suggests that the treatment programmes may not work for everybody which is perhaps further reflected in the high attrition rates. These are commonly reported at around 30% (Olver et al., 2011; Te Hiwi, 2020).

Measuring the effectiveness of the treatment is challenging and there may be many reasons for the attrition (Polaschek, 2019b). For example, a meta-analysis across 114 studies identified disruptive behaviour, negative attitudes, denial, and personality disorders as predictors of treatment attrition (Olver et al., 2011). The authors further suggested that the interaction of these variables might also predict attrition. Similarly, a more recent systematic literature review which included 11 studies, also reported negative attitudes, denial, and personality disorders as predictors of treatment attrition (Sturgess et al., 2016). Interestingly, Olver and colleagues (2011) did not find childhood maltreatment, with exception of sexual abuse, to be a predictor of attrition. However, New Zealand's most current evidence suggests that treatment progress and attrition rates are associated with childhood trauma, such that those individuals who have experienced childhood trauma show poorer progress in the treatment of violent offending and have higher attrition rates (Te Hiwi, 2020).

Traumatic Childhood Events

Multiple terms are commonly found in the research on childhood traumatic events. The variability in terms and the absence of unified definitions pose challenges with the measurement and construction of explanations in research. The word trauma, originating from the Greek word *traumatikós* (Oxford University Press, 2020, para 3), refers to physical

injury, though it has been for centuries used to describe both physical and emotional injury. In the literature, the word maltreatment is also used when describing emotional and physical neglect or abuse of children. Additionally, Felitti and colleagues coined the term adverse childhood experiences (ACEs) to describe experiences such as abuse and neglect, with the inclusion of adverse experiences in families, such as parental mental health, substance use, divorce, incarceration, and domestic violence (Felitti et al., 2019). In the current study, terms childhood traumatic events, childhood trauma or maltreatment will be used interchangeably to refer to any childhood adverse events such as neglect, physical, emotional and sexual abuse, as well as violence witnessing (at home or in the community) and removal from family (e.g., state care).

Childhood maltreatment is "a tragedy of human error and human circumstances" and a sad reflection of the society which fails to "provide families with support and safety nets" (Wekerle et al., 2014, p. 737). In New Zealand, on average, about every four minutes a child experiences a traumatic event (Gerrard & Lambie, 2018). Recently, Oranga Tamariki – Ministry for Children – reported call-outs relating to concern involving 62,700 children (Oranga Tamariki, 2019), and the New Zealand Police documented 14, 802 children who were abused and/or neglected in 2018 (Gerrard & Lambie, 2018). New Zealand's high rates of childhood traumatic events are associated with negative outcomes in mental and physical health, as well as with social problems including criminal offending (Gerrard & Lambie, 2018).

Traumatic Childhood Events and Offending Behaviour

Numerous studies have found a relationship between childhood traumatic events and violent behaviour occurring later in life (e.g., Bland et al., 2018; Bunney et al., 2017; Dudeck et al., 2016; Forsman & Långström, 2012; Fox et al., 2015; Levenson & Grady, 2016; Teague

et al., 2007). Childhood trauma can be observed in incarcerated individuals at significantly higher rates than in the general population (e.g., Bevan, 2017; Lambie & Gerrard, 2018; Nesi et al., 2020).

Although studies have found a link between childhood traumatic events and adult violence, little is understood about the mechanisms of this relationship. Physical and sexual abuse have received a substantial amount of attention over the years; however, neglect appears to be under-researched despite it being disproportionately recorded by child-protection agencies (Gilbert et al., 2009). Regardless of a paucity of research on neglect, the current literature review suggests that emotional and physical neglect in childhood are equally significant predictors of violent behaviour in adulthood as the abuse is (Bland et al., 2018).

Various hypotheses have been proposed as explanations for the relationship between childhood traumatic events and violent behaviour in adulthood. One suggestion is that self-control, considered a strong predictor for delinquency and crime, is negatively affected by traumatic childhood events (Meldrum et al., 2020). The authors provided evidence for adverse childhood events contributing to deficits in self-control in the youth population. These recent findings are aligned with the existing research which suggests an association between certain aspects of self-control (e.g., impulsivity, poor delay gratification, and lack of future orientation) and adverse childhood events (e.g., Bunch et al., 2018; Craig, 2019; Perez et al., 2018).

In an attempt to explain how such deficits may occur, Puetz et al. (2019) suggested that different types of childhood trauma may affect neural threat reactivity in various ways. For example, childhood abuse and childhood neglect were individually associated with

hyper-activation of the amygdala, while combined and prolonged abuse and neglect were associated with hypo-activation of the amygdala and higher-order cortical regions of the brain (Puetz et al., 2019). Hypo-activation of the amygdala was found to be associated with severe externalising behaviour defined by high callous and unemotional traits in youth (Cardinale et al., 2018). On the other hand, hyper-activation of the amygdala is associated with hypervigilance and fear response, and when under-regulated by prefrontal cortex it may lead to deficits in self-control, emotion dysregulation or development of psychopathologies such as anxiety and depression (Kessler et al., 2020; Paschke et al., 2016).

Another possible explanation for the link between childhood trauma and adult violent offending is that experiences of trauma may lead to the development of particular criminogenic knowledge structures or schemas (Baron & Forde, 2019). That is, individuals who experienced maltreatment may perceive the world as hostile and unsafe, and they may develop various coping mechanisms or survival strategies. One such strategy may be to form an association with antisocial peers which, in turn, further promotes individual's criminogenic schemas.

Yet another set of maladaptive cognitive processes that may explain the relationship between childhood trauma and adult offending are the cognitive distortions in the form of criminal thinking styles (e.g., cutoff, discontinuity, or entitlement). Cognitive distortions are currently considered one of the risk factors for violent offending (Bonta & Andrews, 2017; Low & Day, 2017), and were reported to mediate the association between childhood maltreatment and adult criminal behaviour (Cuadra et al., 2014). Cuadra and colleagues' findings support the cycle of violence theory (Widom & Maxfield, 2001) which suggests that children who witness violence or experience maltreatment may develop beliefs that criminal behaviour is an acceptable and effective way of achieving goals. The cycle of violence theory

perhaps encompasses the broadest explanation for the relationship between childhood traumatic events and the violent or criminal behaviour later in life.

Regardless of the pathway from childhood trauma to offending behaviour, research has found the association to be stable over time, with the addition of the dose-response effect. That is, individuals who experience more types of trauma during childhood show higher levels of antisocial behaviour throughout their lives (Degli Esposti et al., 2020). Degli Esposti and colleagues' large population-based longitudinal study findings align with the recent results from New Zealand which suggest that incarcerated, high-risk individuals experience on average four or more types of childhood trauma (Te Hiwi, 2020).

As discussed thus far, it is evident that childhood traumatic events are commonly observed in populations with offending behaviour. The mechanisms of this relationship continue to be the subject of ongoing research. In this current study, I am interested in the relationship between childhood traumatic events and the treatment of violent offending. In particular, I aim to investigate whether maladaptive personality traits contribute to this relationship. In the following sections, I will introduce the terms personality and maladaptive personality traits and I will introduce each of the three maladaptive personality traits relevant to this study – antisocial, borderline, and psychopathic. Next, I will outline the studies that explored the association between childhood trauma and the development of maladaptive personality traits. Lastly, I will consider the effects they may have on the treatment of violent offending.

Personality and Maladaptive Personality Traits

The term personality refers to "individual differences in characteristic patterns of thinking, feeling and behaving" (American Psychological Association, 2020, para. 1). When

the enduring characteristic patterns noticeably deviate from the social norms and individual's culture – to the point that they cause distress – they are considered *psychopathology* (American Psychiatric Association, 2013). As such, the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; APA 2013) labels them personality disorders (e.g., antisocial personality disorder) by grouping them in discrete categories. These categories are then further grouped into three clusters (i.e., A, B, and C) based on their distinct clinical syndromes.

Theodore Millon's (1990) evolutionary model of personality heavily influenced the structure and the personality prototypes of the Diagnostic and Statistical Manual of Mental Disorders (DSM) throughout the three editions from the DSM-III (American Psychiatric Association, 1980) to the current DSM-V (APA, 2013). According to Millon and colleagues, three polarities or dimensions (e.g., pleasure/pain, active/passive, and self/other) determine individual's personality (Millon et al., 2009; Millon, 1983; Millon & Davis, 1996). At the extreme end of the scale, any deficiencies, imbalances, or conflicts in these three dimensions may lead to personality disorder. For example, an imbalance in the self/other dimension, with a deficiency in the focus of others may lead to narcissistic personality disorder. At the same time, Millon (2011) also argues that any elevation on the dimension's scale merely suggests a characteristic of the individual's personality type rather than a pathology. He proposed that what distinguishes normal from abnormal personality is adaptive functioning.

To measure the theoretical dimension discussed above, Theodore Millon (1997) developed a self-report measure of personality, Millon Clinical Multiaxial Inventory (MCMI), which has over the years undergone multiple changes and is currently in its fourth edition (MCMI-IV; Millon et al., 2015). Developers' validation samples suggest good reliability and validity for the measures – the MCMI-III Cronbach's alphas for the scales

ranged from .66 - .90 (Millon et al., 2009), while the MCMI-IV Cronbach's alphas ranged from .67 - .92 (Millon et al., 2015). This is endorsed by other studies which report good reliability and validity for the MCMI-III scales (e.g., Cuevas et al., 2008; Lightfoot Jr, 2017). Although the earlier versions have been under the validation scrutiny over the years, to date little research has been published on the MCMI-IV (Grossman, 2019).

Based on Millon's idea of personality dimensions being presented on a continuum, I will be referring to maladaptive personality traits rather than personality disorders in this study. Personality traits are tendencies to "feel, perceive, behave, and think in relatively consistent ways across time and across situations in which the trait may manifest" (APA, 2013, p. 772). When personality traits deviate from norms they are considered maladaptive (Widiger & Costa, 1994). Three types of maladaptive personality traits will be explored in this study – antisocial, borderline, and psychopathic.

Antisocial Traits

Antisocial personality traits are considered one of the central eight risk factors associated with criminal behaviour (Bonta & Andrews, 2017). Some of the defining traits of antisocial personality are impulsiveness, reckless pleasure-seeking, restlessness, aggression, and callous disregard for others. At a most destructive level, when the pattern of disregard for, and violation of, the rights of others becomes pervasive and the behaviour violates social norms and laws, it is considered psychopathology and labelled as an antisocial personality disorder (American Psychiatric Association, 2013). Antisocial personality disorder is a multifactorial construct where a possible genetic predisposition is exacerbated by environmental factors such as adverse childhood experiences (DeLisi et al., 2019).

Borderline Traits

Borderline personality traits are marked by an ongoing pattern of instability in interpersonal relationships, self-image, affects, and impulsive behaviour, including frantic avoidance of real or imagined abandonment (American Psychiatric Association, 2013). These symptoms often result in impulsive actions and problems in relationships. Individuals high on borderline personality traits are highly sensitive to environmental circumstances and experience strong abandonment fears and anger when faced with separation. The intense emotions and impulsivity are often lifelong traits (American Psychiatric Association, 2013).

Psychopathic Traits

Psychopathy is conceptualised as persistent behavioural deviancy commonly accompanied by emotional and interpersonal detachment (Patrick, 2010). Even at a higher end of the spectrum, psychopathy is not considered a personality disorder, but it is rather considered as a constellation of traits. Some of the traits that describe individuals high on psychopathic traits would include impulsive and antisocial behaviour and/or empathy deficit paired with self-centredness, usually referred to as callous and unemotional traits. These traits are characterised as a continuum rather than a taxon. Triarchic Model of Psychopathy (TriPM; Patrick, 2010) encompasses three distinct phenotypic constructs: disinhibition, boldness, and meanness. Firstly, disinhibition is associated with impulsivity, anger or hostility, and oppositional behaviour supposedly due to impairment of higher brain stems functioning. This means individuals fail to moderate their actions and reactions based on their past experiences or anticipation of future consequences. Secondly, boldness refers to low anxiousness and high dominance and is associated with deviation in responsiveness in the lower brain structures including the amygdala. This means an individual is perceived as

fearless with the capacity to recover rapidly from stressors and with a tolerance for danger. And lastly, meanness suggests an individual tends to display callousness, aggression and cruelty and is likely to seek excitement as a result of diminished behavioural and brain responses to aversive events. Without the disinhibition aspect, the meanness and boldness aspects, whether together or on their own, are not considered psychopathy (Patrick, 2010).

Conceptualisation of personality is a much-debated topic, in particular, the maladaptive personalities and personality disorders continue to be a source of many controversial debates (e.g., Lilienfeld et al., 2019; Morey, 2019; Sleep, Lynam, et al., 2019). The issues with conceptualisation of personality are beyond the scope of this thesis and I acknowledge that maladaptive personality traits, such as antisocial, borderline, or psychopathic personality traits, contain multiple traits which, in combination, are responsible for more or less prominent presentation of the labels referred to. The focus of this study will be on whether the development of maladaptive personality traits may be linked to childhood traumatic events.

Childhood Traumatic Events and Maladaptive Personality Traits

Empirical evidence suggests the link between extensive and prolonged trauma in early developmental stages and the development of psychopathologies (e.g., depression and anxiety) and complex personalities such as psychopathy, antisocial and borderline personality (e.g., Boland et al., 2020; de Carvalho et al., 2015; Goddard & Pooley, 2019; Schimmenti et al., 2015; Zhang & Zheng, 2018). For example, a study with over 8,0000 participants explored the association between childhood trauma and personality traits and found a link between childhood trauma, temperament and development of maladaptive personalities (de Carvalho et al., 2015). That is, participants with temperaments such as harm avoidance, reduced reward dependence, persistence and cooperativeness who experienced childhood

trauma were at a higher risk of developing psychiatric disorders, including maladaptive personalities. Maladaptive personality traits were strongly associated with emotional events; though the association was not significant in cases of physical trauma. Furthermore, Carvalho and colleagues found that all types of maltreatment (excluding neglect) were associated with increased novelty-seeking behaviour (de Carvalho et al., 2015). Similar results were revealed by a literature review, which identified childhood abuse as a risk factor for aggression and impulsive behaviour (Goddard & Pooley, 2019).

Findings also suggest the dose-response effect, such that those who experience more childhood traumatic events develop more extreme maladaptive personality traits. For example, Boland and colleagues found that maltreatment was positively associated with maladaptive personality traits and that more severe maltreatment was associated with greater negative affectivity (Boland et al., 2020). This is problematic, as exposure to one type of maltreatment is a likely predictor of exposure to other types of trauma over time (de Carvalho et al., 2015; Gerrard & Lambie, 2018; Te Hiwi, 2020). Therefore, it is likely that individuals who report severe and prolonged traumatic events in childhood are more likely to develop maladaptive personality traits such as antisocial, borderline, or psychopathic personality traits than those exposed to less severe and less prolonged traumatic events.

Antisocial personality disorder may be more commonly observed in individuals with adverse childhood experiences. For example, a study including 436 individuals in forensic psychiatric care found that men who experienced early childhood victimisation, in particular physical abuse, were diagnosed with antisocial personality disorder more frequently than those who did not have any such history (Bohle & de Vogel, 2017). No such relationship was found in female cases of antisocial personality disorder. Instead, women who experienced victimisation in early childhood were more frequently diagnosed with borderline personality

disorder compared to those without such experience and compared to men with similar experiences of victimisation. Nevertheless, the prevalence of the borderline personality disorder diagnosis was elevated for both genders.

Similar to antisocial personality traits, borderline personality traits are observed at a greater rate in individuals with a history of trauma (Ball & Link, 2009; Bohle & de Vogel, 2017). A systematic literature review identified maltreatment as a risk factor for borderline traits in children, and borderline personality disorder in adulthood (Ibrahim et al., 2018). The same review reported a cumulative effect of maltreatment, suggesting that individuals who experienced maltreatment across developmental stages presented with higher levels of borderline personality traits compared to those with no history of maltreatment. Furthermore, the review found abuse and neglect to be independently associated with borderline personality traits. Another study with a forensic psychiatric sample identified emotional and sexual abuse as the two most significant predictors of borderline personality disorder in female participants (Bohle & de Vogel, 2017).

More recent research also suggests an association between the act of witnessing family violence and the elevated levels of borderline personality traits in adolescence (Sharp et al., 2020). Individuals who witnessed family violence in childhood showed higher levels of borderline personality traits in adolescence compared to those without such experiences. This is important as family violence is unfortunately common in New Zealand. NZ Police reported over 130,000 ‘family harm’ investigations in one year (NZ Police, 2019).

Overall, maladaptive personalities are commonly recorded in the forensic population. For example, antisocial and borderline personalities were the most frequent Axis-II disorder found in the offending population, in particular those with a sexual or violent offences (Bohle

& de Vogel, 2017). Similarly, a meta-analysis found that antisocial and psychopathic traits were the highest self-reported maladaptive personality traits in a forensic population (Spaans et al., 2017). Psychopathy was also found to be a mediating factor in the relationship between childhood trauma and violent offending (Bohle & de Vogel, 2017), in particular, callous and unemotional traits were identified as one possible underlying mechanism in this relationship (Carlson et al., 2015). Studies suggest that the development of psychopathic traits may be promoted via neurobiological anomalies due to childhood trauma (Gowin et al., 2013; Kolla et al., 2014; Schimmenti et al., 2015) or may be promoted by punitive parenting (Patrick, 2010). Goddard and Pooley (2019) suggested that childhood abuse significantly affects the externalising features of psychopathic traits such as impulsivity, or antisocial behaviour.

In summary, empirical research has found a link between childhood traumatic events and maladaptive personality traits. Antisocial, borderline and psychopathic traits appear to be the most commonly reported maladaptive personality traits in forensic populations or in relation to offending behaviour. It is possible that such complex maladaptive personality traits negatively affect the treatment of violent offending which will be explored in the subsequent section.

Maladaptive Personality Traits and Treatment of Violent Offending

Maladaptive personality traits might reduce individuals' ability to fully engage in treatment. For example, psychopathic personality traits and borderline personality traits are associated with poorer engagement in treatment, superficial progress and higher attrition rates (McCarthy & Duggan, 2010; O'Brien & Daffern, 2017; Romero-Martínez et al., 2016; Schroeder et al., 2013). Furthermore, psychopathic traits (e.g., callous-unemotional and aggression) in individuals with violent offences have been shown to reduce the efficacy of

correctional treatment programmes (Kolla et al., 2014) and are, as such, considered a responsivity issue (Olver & Wong, 2011).

Individuals with maladaptive personality traits are also considered difficult to treat (Reidy et al., 2015; Schroeder et al., 2013). They may face difficulties with developing rapport in the context of the therapeutic relationship, either due to their complex personalities (e.g., impulsive, aggressive, and manipulative) or due to their issues with trust. Also, individuals with maladaptive personality traits may be disruptive in a therapeutic group, which is, in accordance with existing literature (Johnston, 2009), the preferred treatment format in New Zealand's correctional settings.

In summary, maladaptive personality traits may be an important factor contributing to the outcome of treatment of violent offending, thus a more complex assessment and treatment plan may need to be considered for individuals with such traits (Reidy et al., 2015; Schroeder et al., 2013). "Increasing attention to the individual-level factor of psychopathy [and other maladaptive traits] could improve our ability to reduce violence at the community and societal levels." (Reidy et al., 2015, p.1)

Current Study

The majority of high risk, violent incarcerated individuals have experienced early life trauma (Bevan, 2017; Lambie, 2018). It is also recognised that individuals who experienced such early life adversities are likely to develop maladaptive personality traits (Goddard & Pooley, 2019; Schimmenti et al, 2015). Based on these traits they are considered difficult to treat and their responsivity to rehabilitation may be reduced (Kolla et al., 2014; O'Brien & Daffern, 2017; Olver & Wong, 2011). However, to the best of my knowledge, the current study would be the first to directly investigate the effect of maladaptive personality traits – in

particular antisocial, psychopathic, and borderline personality traits – on the relationship between early life trauma and treatment progress for men with a history of violent offending. This study postulated that childhood trauma would be a contributing factor to lowered treatment efficacy and treatment attrition. Furthermore, it was expected that maladaptive traits (e.g., antisocial, borderline and psychopathic traits) would mediate the relationship between childhood trauma and treatment progress and outcomes. Thus, this study aimed to explore how traumatic childhood events were related to the treatment of violent offending, taking maladaptive personality traits into account. It was expected that those individuals high on childhood trauma and antisocial, borderline or psychopathic personality traits would show poorer treatment progress, compared to those with low trauma and/or low antisocial, borderline and psychopathic personality traits. It was also expected that maladaptive personality traits would mediate the negative relationship between childhood trauma and treatment progress.

This current study contributed to a long-term goal of understanding the mechanism(s) behind the complex relationship between childhood trauma and the treatment of men who committed violent offences. Understanding the link between early life experiences, personality characteristics and their effects on rehabilitation is essential as it may inform how to proceed with treatments. For example, whether a treatment approach needed modification in order to increase effectiveness and as such reduce the reoffending rates and improve the quality of individuals' lives. "The more we understand these offenders [high-risk individuals with maladaptive personality traits] in terms of their functional differences the greater our ability to assist…" (Wilson & Tamatea, 2013, p. 507) and subsequently, improve the ability to reduce reoffending, ensure safer societies, and the wellbeing for individuals and their families.

Aims and Hypotheses

The first aim of this study was to assess whether the Millon Clinical Multiaxial Inventory (MCMI-III; Millon et al., 2009, and MCMI-IV; Millon et al., 2015) consistently reflects the constructs that it is measuring. It was expected the internal consistencies of the scales in the currents sample would be consistent with the developers' validation sample.

The second aim of this study was to explore whether maladaptive personality traits may mediate the relationship between childhood trauma and treatment progress. Maladaptive personality traits were expected to mediate the negative relationship between childhood trauma and treatment outcomes.

The third aim of the study was to explore how childhood trauma was related to treatment progress of violent offending, taking personality traits into account. A positive relationship was expected between traumatic childhood experiences and personality traits, while a negative relationship was expected between traumatic childhood experiences and treatment progress (e.g., treatment engagement and completion). Similarly, a negative relationship was expected between personality traits and treatment progress.

Method

Participants

The research was conducted using an existing dataset of 417 men who had been assessed as high-risk violent individuals with scores over 0.7 and above on the RoC*RoI (Risk of Conviction and Risk of Reimprisonment algorithm used to measure the risk; Bakker et al., 1999). The men participated in the Department of Corrections' high-intensity rehabilitation programmes (STURP) at the four Special Treatment Units across New Zealand between January 2016 and March 2019. Their age at the beginning of the treatment ranged from 18 – 60 years (M = 33.5, SD = 9.1). The Department of Corrections ethnicity data showed that more than half (64.3%) of all participants were of Māori descent (n = 268), followed by 25.2% Europeans (n = 105), less than 1% Pacific (n = 41), and a very small percentage were of other ethnicity (n = 3). Data analysed included all men who enrolled in the STURP including those who had not completed the treatment. Only men who agreed to research being conducted with their data, as part of their enrolment with the STURP programme, were included. Ethical approval was granted for this study by the Victoria University of Wellington School of Psychology Human Ethics Committee and the research was approved by the Department of Corrections.

Measures

This study used retrospective programme participation data. As such, three measures from the existing dataset were utilised in this study: Millon Clinical Multiaxial Inventory (Millon et al., 2009, 2015); the Triarchic Psychopathy Measure (TriPM; Patrick, 2010); and Psychological Reports. The TriPM and the MCMI self-report measures were administered in an assessment prior to and after the individual's treatment, while the Psychological Reports prepared by STURP psychologists were completed at the end of treatment. The Psychological

Reports included information on men's childhood traumatic events and their treatment progress. The measures are explained in detail below.

Millon Clinical Multiaxial Inventory (MCMI-III, 4th ed.; Millon et al., 2009; and MCMI-IV; Millon et al., 2015)

Two versions of the Millon Clinical Multiaxial Inventory were utilised in this study: MCMI-III and MCMI-IV. The MCMI-III is a 175-item true-false self-reported questionnaire for the clinical assessment of personality traits and psychopathologies in accordance with the diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000). While the more recent and revised version, MCMI-IV, is a 195-item questionnaire and is aligned with the DSM-V (American Psychiatric Association, 2013) diagnostic criteria for psychopathologies. The MCMI measure is routinely used in clinical, correctional and substance abuse settings (Reminger, 2017). In New Zealand, men attending the STURP completed the questionnaires before and on completion of their treatment.

Overall, studies report good reliability and validity for the MCMI-III scales. For example, Lightfoot Jr, (2017) reported good reliability with Cronbach's alphas (α) ranging from .66 - .89. This is consistent with the MCMI-III Manual (Millon et al., 2009) which reports the range from .66 - .90. To date, there is little research available on the MCMI-IV reliability. However, the MCMI-IV Manual (Millon et al., 2015) indicated the test-retest reliability for data of 129 individuals as very stable, with correlations ranging from .73 to .92.

This current study had the opportunity to explore the reliability and validity of the MCMI-III and MCMI-IV used in New Zealand forensic population. This helped to determine

whether the measure was suitable not only in the context of this research but also in the context of its wider use within the New Zealand correctional programmes for assessments.

For this reason, the item scores for the MCMI-III and MCMI-IV were requested from the Department of Corrections. This was obtained in addition to the already existing MCMI scales' scores in the original dataset. The additionally requested dataset ($N = 771$) is larger than the current study sample ($N = 417$); however, it fully incorporates the study's sample. Due to the de-identified nature of the data, I was unable to link the two samples. Therefore, to investigate the reliability of the MCMI measures, the complete dataset was used ($N = 771$). The validity scale in the MCMI measures captures any invalid or careless responding (Millon et al., 2015; Millon et al., 2009), and only the participants with valid responses, as defined by the validity scale, have been used in the current study.

The Triarchic Psychopathy Measure (TriPM; Patrick, 2010)

The TriPM is a 58-item self-report measure that rates the extent of endorsement for statements referencing the three distinct aspects of the Triarchic model of psychopathy: boldness, meanness, and disinhibition. The responses are measured on a four-point Likert scale, ranging from "false" (0) to "true" (3). The data included only the total scores for the three aspects – disinhibition, boldness, and meanness – and not the individual item scores. The sum scores, including the three aspects of psychopathy, were created and then analysed to ascertain relationships between the study variables. The TriPM is a commonly used screening tool for psychopathy. The tool has been reported to have good reliability and validity in both community and forensic samples (Evans & Tully, 2016; van Dongen et al., 2017; Wall et al., 2015). A more recent study involving a prison sample of 107 men, reported a good reliability for the TriPM aspects with Cronbach's alpha ranging between .81 and .92

(boldness: α = .81, 95% confidence interval, CI = [.73, .87]; meanness: α = .92, 95% CI = [.89, .95]; disinhibition: α = .85, 95% CI = [.79, .90]; Gray et al., 2019).

As in the case of the Millon Clinical Multiaxial Inventory, the TriPM reliability analysis for the study sample was also considered; however, due to Covid-19 logistical constraints I was unable to obtain the item scores from the Department of Corrections.

Department of Corrections' Psychological Reports

The reports were prepared by the institution's psychologists at the end of the individual's treatment; that is, at their graduation or at an early exit from the Special Unit Treatment Rehabilitation Programme. The reports included extensive information on the individual's developmental background, offence history, psychological assessments, and case formulation, as well as treatment progress and their release plan if applicable. Reports were reviewed internally and were considered a reliable source of information based on these reviews.

For this study, two particular areas of the report were considered: information on traumatic childhood events; and the treatment progress and outcome. The existing Te Hiwi (2020) definitions for these variables and their coded data were used. That is, childhood trauma was coded as abuse: physical, sexual, and emotional; neglect: (lack of) necessities and (lack of) supervision; violence witnessing; and time spent in State Care. Types of childhood trauma were recorded as either absent (0) or present (1). The total maltreatment score was created by adding all recorded childhood trauma for each individual. The treatment progress was coded as: non-completion (0); little or superficial progress (1); variable progress (2); initially struggled then improved (3); and improvement throughout (4). An additional treatment outcome variable was created for this study which, based on the treatment progress

variable, indicated whether the individual completed (1) or did not complete (0) the treatment. Te Hiwi (2020) reported the inter-rater reliability as almost perfect for maltreatment, Cohen's Kappa (κ) = .93, and substantial for treatment progress, κ = .77.

Procedure

The existing, de-identified, and coded dataset was obtained from the Department of Corrections and data were prepared for analyses. The initial dataset included 423 participants, though 6 of the participants were excluded due to their missing scores on the Millon Clinical Multiaxial Inventory measure.

Analysis

To answer the three research questions posed in this study, three types of analyses were proposed: reliability analysis; mediation analysis; and the structural equation modeling (SEM) using the JASP statistical software (JASP Team, 2020). Firstly, to assess the MCMI measure's reliability the internal consistency analysis, along with the scales' inter-correlations and their comparison between the NZ sample and developers' sample were used. Secondly, a mediation analysis was proposed to assess the direct and indirect effects of childhood trauma experiences for treatment outcome, controlling for the mediator maladaptive personality traits. However, as the mediation analysis did not meet all the required assumptions, binomial and ordinal logistic regressions were used as the alternative analyses. Thirdly, to assess how different types of childhood trauma are related to treatment of violent offending, taking maladaptive personality traits into account, SEM analysis was used. The structural relationships between treatment progress and cumulative number of childhood traumatic experiences as well as maladaptive personality traits was analysed. Lastly, in addition to the three planned analyses, the configural frequency analysis, was

conducted to assess whether there are any specific associations between the treatment progress and different types of maltreatment, and whether specific pattern configurations of maltreatment types and treatment progress may be observed more or less often than statistically expected.

Results

Descriptive Statistics

Table 1 presents descriptive statistics for the study variables and it includes mean, standard deviation, skewness, kurtosis and Shapiro-Wilk's test of normality. Possible scores for the maltreatment variable ranged from 1 – 7 and for the treatment progress variable from 0 (non-completion) – 4 (improvement throughout).

Table 1

Descriptive Statistics and Sample Distributions for Study Variables (N = 417)

Variable	*M*	*SD*	Skewness	Kurtosis	Shapiro-Wilk
Maltreatment	3.84	1.90	-.10	-.87	< .001
Treatment progress	1.89	1.45	-.03	-1.40	< .001
Borderline	54.50	22.68	-.64	-.51	< .001
Boldness	29.82	7.16	-.08	.93	.005
Meanness	20.34	10.34	.34	-.34	< .001
Disinhibition	37.48	10.91	-.15	1.46	< .001
TriPM_Sum	87.64	19.51	-.10	-.07	.05
Antisocial personality	79.90	16.43	.20	8.10	<.001

Note: Shapiro-Wilk p-value < .05 indicates data significantly deviates from a normal distribution; TriPM_Sum = Triarchic Psychopathy Measure total.

The table shows all variables significantly deviated from a normal distribution. Violation of assumption of normality was addressed and discussed in each statistical analysis when required.

Zero-order Spearman correlations between the study variables are presented in Table 2. The maltreatment variable correlated significantly with treatment progress and with borderline personality traits but not with antisocial traits or psychopathy and its three constructs: disinhibition; boldness; and meanness. Treatment progress was significantly correlated only with meanness.

Table 2

Zero-order Spearman Correlations for Study Variables

Variable	1	2	3	4	5	6	7	8
1. Maltreatment	—							
2. Treatment progress	.37***	—						
3. Borderline	.13**	-.07	—					
4. Boldness	-.04	.01	-.02	—				
5. Meanness	.06	-.10*	.30***	.10*	—			
6. Disinhibition	-.01	-.07	.48***	-.05	.43***	—		
7. TriPM_Sum	.02	-.09	.40***	.38***	.81***	.73***	—	
8. Antisocial personality	-.07	.05	.41***	.11*	.43***	.51***	.55***	—

Note: TriPM_Sum = Triarchic Psychopathy Measure total.

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

Reliability of the Millon Clinical Multiaxial Inventory (MCMI) Measure

Internal Consistency

Internal consistency analysis was conducted to assess the reliability of the MCMI measure. This analysis was based on a larger cohort which incorporated the current study sample. Only valid MCMI profiles, as defined by the MCMI validity scale, were used in this study. Furthermore, a list-wise deletion was used as treatment of missing values in data,

which is a commonly used approach when dealing with missing data (Kang, 2013). The data was missing completely at random and the percentage of missing data was small, which suggests the statistical power of the analysis was adequate. The final sample numbers are reflected in the Table 3 and Table 4.

In addition to the internal consistency of the MCMI scales, the differences in reported reliability were computed using the platform-independent *Cocron* package (Diedenhofer & Musch, 2016). This statistical analysis tests for significant differences between the correlation coefficients of the current sample compared to the developer-reported validation sample (see Table 3 and Table 4).

Table 3

Internal Consistency of the MCMI-III Scales and the Correlation Coefficient Differences

		MCMI-III internal consistency Cronbach's α					Cronbach's α differences	
	Number of items	Pre-treatment [a]	*N*	Post-treatment [b]	*N*	Validation sample [c]	a – c χ^2	b – c χ^2
Schizoid	16	.75	229	.75	188	.81	4.91*	4.35*
Avoidant	16	.84	229	.82	188	.89	9.22**	14.28***
Depressive	15	.87	228	.86	189	.89	1.79	3.33
Dependent	16	.80	227	.78	187	.85	5.38*	8.53**
Histrionic	17	.71	227	.63	188	.81	11.80***	26.67***
Narcissistic	24	.58	219	.35	186	.67	3.84*	28.41***
Antisocial	17	.75	224	.74	188	.77	.44	.86
Sadistic	20	.82	226	.81	190	.79	1.52	.57
Compulsive	17	.63	226	.66	186	.66	.46	.00
Negativistic	16	.85	225	.86	186	.83	.98	2.05
Masochistic	15	.85	229	.85	189	.87	1.31	1.16
Schizotypal	16	.86	229	.86	188	.85	.30	.27

		MCMI-III internal consistency Cronbach's α					Cronbach's α differences	
	Number of items	Pre-treatment [a]	*N*	Post-treatment [b]	*N*	Validation sample [c]	a – c χ^2	b – c χ^2
Borderline	16	.83	230	.83	190	.85	1.01	.90
Paranoid	17	.86	227	.87	187	.84	1.13	2.36
Anxiety	14	.84	229	.81	188	.86	1.31	5.31
Somatoform	12	.77	231	.78	189	.86	15.69***	11.53***
Bipolar: Manic	13	.77	232	.75	187	.71	3.29	1.17
Dysthymia	14	.85	230	.82	184	.88	3.19	9.31**
Alcohol Dependence	15	.77	226	.77	190	.82	3.85*	3.45
Drug Dependence	14	.77	229	.75	189	.83	5.87*	8.55**
Post-traumatic Stress Disorder	16	.90	231	.88	187	.89	.58	.43
Thought Disorder	17	.87	231	.85	189	.87	.00	1.18
Major Depression	17	.85	231	.83	188	.90	1.95***	16.75***
Delusional	13	.74	227	.78	189	.79	2.86	.12

Note: [a] [b] Study sample sizes are variable for each scale as per list-wise exclusion of missing values. [c] Developers' validation sample size $N = 398$ (Millon et al., 2009).

a – c = Cronbach's α differences between study sample pre-treatment and developers' sample; b – c = Cronbach's α differences between study sample post-treatment and developers' sample.

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$

The MCMI-III scales show good internal consistency. The overall Cronbach's alpha was good, α = .80 for the pre-treatment assessment. The lowest reliability was reported for the narcissistic scale, α = .58 and the highest for the post-traumatic stress disorder, α = .90. Similarly, for the post-treatment assessment, the overall reliability was acceptable α = .78,

with the lowest reliability for the narcissistic scale, α = .35, and the highest again for the post-traumatic stress disorder, α = .88. In comparison with the developers' reports of the MCMI-III reliability, there were significant differences in Cronbach's alphas for the pre- and post-treatment for the following scales: schizoid; avoidant; dependent; histrionic; narcissistic; somatoform; drug dependence; and major depression. Further significant differences between correlations were observed pre-treatment only for the alcohol dependence scale, and post-treatment for the dysthymia scale (see Table 3 above). All mentioned scales showed significantly lower reliability in the current sample compared to the developers' sample.

Table 4

Internal Consistency of the MCMI-IV Scales and the Correlation Coefficient Differences

		MCMI-IV internal consistency Cronbach's α					Cronbach's α differences	
	Number of items	Pre-treatment [a]	*N*	Post-treatment [b]	*N*	Validation sample [c]	a – c χ^2	b – c χ^2
Schizoid	15	.80	181	.80	145	.82	.80	.66
Avoidant	18	.87	182	.80	150	.89	2.11	25.49***
Melancholic	19	.88	183	.85	148	.92	13.37***	28.25***
Dependent	14	.80	182	.67	151	.81	.19	2.93***
Histrionic	17	.71	182	.67	148	.83	23.54***	31.34***
Turbulent	17	.82	176	.77	147	.87	8.05**	22.50***
Narcissistic	16	.73	183	.74	148	.75	.43	.09
Antisocial	14	.73	182	.72	149	.78	3.10	3.63
Sadistic	14	.79	184	.76	150	.80	.17	2.06
Compulsive	13	.63	180	.59	149	.67	.93	2.82
Negativistic	18	.85	181	.84	147	.86	.35	1.10
Masochistic	18	.87	183	.86	150	.90	5.36*	7.54**
Schizotypal	21	.87	180	.86	148	.89	2.13	3.79
Borderline	20	.88	186	.88	148	.91	6.66**	5.43*
Paranoid	16	.81	182	.85	148	.84	2.21	.24

		MCMI-IV internal consistency Cronbach's α					Cronbach's α differences	
	Number of items	Pre-treatment [a]	*N*	Post-treatment [b]	*N*	Validation sample [c]	a – c χ^2	b – c χ^2
Generalised Anxiety	13	.83	184	.84	150	.82	.23	.78
Somatic Symptoms	10	.82	179	.78	150	.84	.93	6.14*
Bipolar Spectrum	13	.70	185	.70	146	.71	.08	.07
Persistent Depression	21	.89	179	.86	149	.93	16.65***	35.49***
Alcohol use	8	.72	186	.73	148	.65	3.01	3.27
Drug Use	11	.81	183	.81	149	.83	.86	.72
Post-traumatic Stress	14	.89	184	.89	151	.86	3.87*	3.22
Schizophrenic Spectrum	21	.85	180	.87	147	.86	.35	.33
Major Depression	17	.88	180	.89	148	.92	13.01***	6.59*
Delusional	14	.77	181	.71	150	.81	2.68	11.80***

Note: [a] [b] Study sample sizes are variable for each scale as per list-wise exclusion of missing values. [c] Developers' validation sample size $N = 1547$ (Millon et al., 2015).

a – c = Cronbach's α differences between study sample pre-treatment and developers' sample; b – c = Cronbach's α differences between study sample post-treatment and developers' sample.

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$

The MCMI-IV scales show good internal consistency. The overall Cronbach's alpha was good, α = .81, for the pre-treatment assessment. The lowest reliability was reported for the compulsive scale, α = .63 and the highest for the persistent depression and the post-traumatic stress scales, α = .89. For the post-treatment assessment, the overall reliability was acceptable α = .79, with the lowest reliability for the compulsive scale, α = .59, and the

highest for the post-traumatic stress and major depression scales, α = .89. In comparison with the developers' reports for the MCMI-III reliability, there were significant differences in Cronbach's alphas for the pre- and post-treatment for the following scales: melancholic; histrionic; turbulent; masochistic; borderline; persistent depression; and major depression. Further significant differences in correlations were observed in post-treatment score only for the avoidant, dependent, somatic symptoms, and delusional scales. These scales showed significantly lower reliability in the current sample compared to the developers' sample, with exception of the post-traumatic stress scale which showed significantly higher reliability for the pre-treatment assessment in the current sample.

MCMI Correlation Differences Comparison

To further assess the reliability of the MCMI tool, the Fisher exact test was conducted, comparing the two independent correlations: developers' and the study sample scale correlations. The significances of the score differences were established by transforming the *r*-scores to *z*-scores, taking into consideration the sample size of the two individual samples. Overall, the MCMI-III developers' scales correlations were significantly higher compared to the study scales correlations as presented in Table 5.

Table 5

MCMI-III Scale Correlation Differences Between the Study Sample and the Developers' Sample

Study Sample	Developers' Sample																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1.Schizoid	—	.71	.64	.48	-.75	-.43	.32	.32	-.38	.57	.59	.67	.59	.57	.55	.61	.26	.68	.35	.37	.61	.64	.62	.41
2.Avoidant	.54	—	.72	.65	-.80	-.65	.28	.27	-.40	.61	.70	.68	.26	.57	.55	.54	.28	.66	.32	.23	.57	.60	.58	.35
3.Depressive	.39	.64	—	.63	-.65	-.48	.39	.42	-.50	.69	.74	.70	.76	.56	.66	.65	.45	.79	.40	.32	.75	.76	.69	.38
4.Dependent	.27	.61	.64	—	-.52	-.55	.28	.24	-.39	.56	.71	.55	.63	.43	.61	.55	.38	.63	.28	.20	.57	.60	.58	.31
5.Histrionic	-.54	-.63	-.50	-.36	—	.70	-.25	-.23	.46	-.51	-.60	-.61	-.55	-.47	-.49	-.48	-.17	-.65	-.37	-.22	-.52	-.54	-.53	-.31
6.Narcissistic	-.15	-.33	-.29	-.27	.63	—	*NS*	*NS*	.36	-.29	-.45	-.38	-.38	-.18	-.37	-.36	*NS*	-.48	-.15	*NS*	-.37	-.36	-.42	NS
7.Antisocial	.33	.21	*.09*	.14	*.02*	.25	—	.65	-.61	.56	.42	.39	.61	.36	.32	.24	.45	.36	.78	.82	.36	.43	.25	.26
8.Sadistic	.29	.32	.22	.22	*-.07*	.27	.70	—	-.43	.64	.40	.40	.57	.44	.44	.36	.50	.37	.54	.48	.39	.46	.34	.34
9.Compulsive	-.29	-.31	-.29	-.36	.35	.24	-.53	-.40	—	-.50	-.48	-.46	-.63	-.29	-.39	-.35	-.36	-.51	-.53	-.47	-.43	-.48	-.41	-.22
1.Negativistic	.48	.59	.54	.53	-.32	*-.01*	.52	.59	-.46	—	.69	.68	.79	.72	.61	.55	.59	.66	.48	.43	.65	.68	.57	.53
11.Masochistic	.53	.67	.65	.54	-.49	-.20	.36	.37	-.38	.61	—	.70	.73	.54	.60	.56	.47	.70	.41	.35	.64	.67	.60	.35
12.Schizotypal	.55	.69	.55	.55	-.41	*-.07*	.32	.41	-.37	.59	.50	—	.70	.67	.64	.57	.50	.65	.40	.32	.69	.76	.62	.53
13.Borderline	.45	.53	.61	.57	-.33	*-.06*	.53	.52	-.56	.71	.62	.57	—	.55	.67	.58	.57	.74	.54	.51	.74	.79	.68	.42
14.Paranoid	.53	.66	.54	.54	-.39	*.04*	.33	.47	-.31	.70	.59	.72	.58	—	.55	.46	.50	.51	.34	.34	.56	.57	.46	.71
15.Anxiety	.37	.54	.65	.59	-.40	*-.13*	.19	.28	-.25	.49	.53	.53	.61	.51	—	.66	.48	.68	.35	.22	.81	.77	.68	.44
16.Somatoform	.40	.46	.57	.48	-.44	-.28	*.12*	.14	-.38	.41	.42	.41	.48	.44	.50	—	.32	.78	.26	.13	.64	.71	.87	.39
17.Bipolar Manic	.37	.43	.51	.51	-.15	*.08*	.51	.55	-.44	.63	.52	.57	.72	.56	.53	.38	—	.35	.39	.39	.48	.52	.31	.42

Study Sample	Developers' Sample																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
18.Dysthymia	.51	.60	.77	.53	-.56	-.32	.13	.23	-.38	.53	.64	.53	.58	.57	.55	.63	.47	—	.38	.26	.73	.79	.84	.38
19.Alcohol Dependence	.33	.34	.31	.31	-.26	*-.04*	.62	.51	-.46	.47	.45	.34	.55	.35	.38	.33	.43	.29	—	.63	.38	.42	.27	.24
20.Drug Dependence	.13	.19	*.10*	*.11*	*-.02*	.18	.68	.62	-.42	.35	.19	.24	.41	.27	.15	*.12*	.36	*.11*	.50	—	.29	.33	.17	.21
21.PTSD	.31	.54	.74	.56	-.44	-.21	*.11*	.25	-.26	.52	.53	.51	.63	.49	.80	.49	.49	.65	.33	.14	—	.77	.46	.43
22.Schizo. Spectrum	.51	.58	.60	.55	-.33	*-.07*	.36	.43	-.41	.66	.58	.72	.72	.65	.65	.54	.70	.61	.38	.28	.59	—	.77	.46
23.Major Depression	.43	.50	.65	.53	-.50	-.32	*.07*	*.12*	-.39	.45	.51	.46	.58	.46	.57	.86	.40	.72	.30	*.06*	.63	.58	—	.39
24.Delusional Disorder	.42	.51	.48	.42	-.27	.20	.28	.41	-.20	.56	.42	.62	.51	.81	.46	.36	.50	.45	.30	.29	.44	.54	.37	—

Note: Developers' correlation coefficient higher = dark grey. Developers' correlation coefficient lower = light grey. Numbers in italics denote non-significant correlations.

Similarly, the MCMI-IV developers' scales correlations were overall significantly higher compared to the study scales correlations as presented in Table 6. However, narcissistic and bipolar spectrum scales in the study sample showed overall higher correlations compared to the developers' sample.

Table 6

MCMI-IV Scale Correlation Differences Between the Study Sample and the Developers' Sample

Study Sample	Developers' Sample																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1.Schizoid	—	.68	.62	.43	-.65	-.55	.03	.20	.37	-.04	.59	.56	.64	.58	.58	.48	.49	.21	.61	.21	.12	.43	.58	.57	.32
2.Avoidant	.64	—	.81	.66	-.72	-.67	-.10	.18	.37	-.03	.64	.77	.72	.72	.58	.58	.52	.24	.73	.27	.11	.50	.66	.60	.35
3.Melancholic	.64	.74	—	.66	-.55	-.62	-.04	.20	.41	-.06	.70	.85	.72	.85	.52	.68	.61	.28	.88	.32	.14	.58	.71	.75	.31
4.Dependent	.47	.66	.71	—	-.41	-.47	-.05	.12	.30	-.04	.52	.64	.56	.62	.41	.54	.46	.27	.63	.24	.06	.42	.56	.51	.26
5.Histrionic	-.42	-.55	-.32	-.19	—	.81	.39	.05	-.16	-.04	-.36	-.49	-.43	-.45	-.36	-.33	-.38	.09	-.52	-.06	.03	-.30	-.38	-.43	-.11
6.Turbulent	-.22	-.43	-.30	-.20	.71	—	.36	-.02	-.20	.13	-.39	-.58	-.42	-.52	-.28	-.37	-.50	.09	-.62	-.13	-.01	-.29	-.39	-.53	-.06
7.Narcissistic	.26	.15	.29	.29	.30	.33	—	.52	.34	-.19	.22	.03	.21	.10	.23	.12	.01	.46	-.01	.32	.26	.12	.18	-.00	.36
8.Antisocial	.20	.20	.22	.18	*-.11*	-.17	.21	—	.46	-.47	.34	.29	.35	.32	.28	.21	.09	.42	.20	.63	.69	.22	.31	.14	.26
9.Sadistic	.52	.43	.49	.31	*-.08*	*-.05*	.42	.41	—	-.17	.63	.43	.51	.52	.53	.45	.34	.46	.42	.38	.35	.42	.51	.37	.41
10.Compulsive	*.02*	*-.04*	*.00*	*.04*	.28	.49	.21	-.34	*-.13*	—	-.07	-.16	-.12	-.13	.01	-.02	-.02	-.14	-.07	-.26	-.38	-.01	-.09	-.04	-.02
11.Negativistic	.62	.62	.71	.57	*-.11*	*-.07*	.50	.26	.67	*.06*	—	.65	.74	.76	.73	.64	.54	.48	.68	.37	.22	.58	.74	.60	.50
12.Masochistic	.59	.65	.76	.57	-.25	-.24	.34	.28	.47	*-.04*	.57	—	.72	.83	.51	.60	.54	.32	.79	.40	.20	.53	.68	.64	.32
13.Schizotypal	.68	.69	.74	.55	-.32	-.18	.42	.30	.57	*-.08*	.75	.60	—	.76	.67	.68	.51	.51	.70	.39	.22	.58	.83	.60	.53
14.Borderline	.56	.69	.82	.56	-.31	-.25	.31	.27	.57	*-.06*	.69	.73	.74	—	.54	.69	.61	.42	.84	.42	.24	.62	.77	.75	.37
15.Paranoid	.64	.58	.59	.44	-.17	*-.06*	.44	.28	.69	*.06*	.79	.53	.69	.57	—	.50	.41	.38	.50	.28	.18	.48	.64	.46	.63
16.Generalised Anxiety	.54	.66	.67	.58	-.22	*-.14*	.33	.15	.42	*.07*	.60	.51	.68	.65	.50	—	.64	.43	.72	.27	.15	.78	.82	.69	.35
17.Somatic Symptoms	.44	.51	.56	.47	-.23	-.28	.22	*.01*	.29	*.05*	.45	.38	.48	.52	.39	.52	—	.25	.76	.16	.06	.52	.59	.86	.25

Study Sample	Developers' Sample																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
18.Bipolar Spectrum	.37	.43	.50	.49	*-.01*	*.07*	.52	.25	.50	*.06*	.61	.44	.66	.57	.53	.54	.35	—	.30	.37	.28	.34	.51	.26	.43
19.Persistent Depression	.59	.73	.88	.70	-.35	-.35	.25	*.13*	.40	*.00*	.63	.68	.65	.78	.52	.68	.68	.44	—	.32	.14	.62	.74	.88	.32
20.Alcohol use	.22	.25	.35	.30	*.08*	*-.05*	.34	.30	.37	*-.01*	.33	.41	.25	.36	.23	.28	*.13*	.30	.34	—	.48	.27	.33	.24	.23
21.Drug Use	.19	.17	.21	.18	*-.01*	*-.05*	*.11*	.40	.42	-.17	.20	.26	.13	.27	.20	.16	*.10*	.20	.21	.48	—	.20	.20	.11	.19
22.Post-traumatic Stress	.47	.53	.55	.43	-.25	-.17	.18	.12	.39	*-.02*	.47	.40	.52	.63	.37	.78	.44	.35	.60	.24	.24	—	.68	.59	.35
23.Schizophrenic Spectrum	.62	.68	.73	.53	-.33	-.21	.36	.29	.60	*-.07*	.75	.56	.85	.74	.71	.79	.51	.59	.68	.28	.19	.63	—	.68	.47
24.Major Depression	.49	.56	.69	.53	-.24	-.28	.24	*.07*	.35	*.00*	.50	.46	.54	.65	.42	.60	.85	.42	.80	.21	*.09*	.54	.60	—	.27
25.Delusional	.42	.42	.52	.42	*-.04*	*.06*	.44	.19	.50	*.11*	.65	.39	.63	.48	.69	.48	.33	.52	.47	.22	*.11*	.31	.64	.39	—

Note: Developers' correlation coefficient higher = dark grey. Developers' correlation coefficient lower = light grey. Numbers in italics denote non-significant correlations.

Predicting Treatment Results by Maladaptive Personality Traits and Childhood Maltreatment

This study aimed to assess the direct and indirect effects of childhood maltreatment experiences for treatment progress, controlling for the mediator maladaptive personality traits, in three separate analyses: one for borderline personality, one for antisocial personality, and one for psychopathic personality. A mediation analysis was planned to assess whether maladaptive personality traits mediated the relationship between childhood maltreatment and treatment progress. However, for the mediation analysis, an assumption of a normal distribution of the variables is required, as well as a linear association for all pairs of the variables (Jose, 2013). The latter assumption was not met and therefore the mediation analysis was not conducted.

In place of the mediation analysis, a binomial logistic regression analysis was conducted. The analysis is commonly used for predicting a binary dependant variable from one or multiple independent predictors. In this study, the outcome variable was a binary response variable indicating either non-completion (0) or completion (1) of the treatment. Based on this, a binomial logistic regression analysis was proposed to ascertain the prediction of treatment completion and the independent predictor variables: childhood maltreatment; borderline personality, psychopathic personality, and antisocial personality. The assumption of multicollinearity for the independent variables was tested and the tolerance was ranging between .74 and .99, which suggests low multicollinearity.

The results of the binomial logistic regression analysis show a significant improvement in the fit of the model over the null model, $\chi^2(4) = 32.3$, $p < .001$. Childhood maltreatment, borderline personality, antisocial personality, and psychopathic personality

together explained 7% of variance in the treatment outcome. Childhood maltreatment was a significant negative predictor of treatment progress, $\chi^2(1) = 22.60$, $p < .001$. For every one unit increase on the childhood maltreatment, there is a predicted decrease of .744 in the log odds of men who completed the treatment. Similarly, psychopathic traits were also a significant predictor of treatment progress, $\chi^2(1) = 6.42$, $p < .05$. For every one unit increase on psychopathic traits, there is a predicted decrease of .982 of men who completed the treatment. This means that men who experienced more maltreatment in childhood or were higher on psychopathic traits were less likely to complete the treatment.

Neither antisocial nor borderline personality were a significant predictor in this model. Model coefficients are presented in Table 7.

Table 7

Model Coefficients from the Binomial Logistic Regression

Predictor	χ^2	*df*	*B (SE)*	*z*	*p*	Odds ratio	95% CI	
							Lower	Upper
Maltreatment	22.60	1	-.30 (.07)	-4.567	< .001	.744	.656	.845
TriPM	6.42	1	-.02 (.01)	-2.506	.012	.982	.969	.996
Antisocial	.04	1	< .01 (.01)	.211	.833	1.002	.986	1.017
Borderline	.04	1	< -.01 (< .01)	-.190	.849	.999	.988	1.010

Note: CI = confidence interval. TriPM = Triarchic Psychopathy Measure.
The dependent variable (treatment outcome) had two levels: 0 = non-completion, 1 = completion.

Further to prediction of the treatment outcome, an ordinal logistic regression analysis was conducted to ascertain the prediction of treatment progress and the independent predictor

variables: childhood maltreatment; borderline personality, psychopathic personality, and antisocial personality traits. The analysis is commonly used for predicting an ordinal dependant variable from one or multiple independent predictors. In this study, the outcome variable was based on the levels of treatment progress measurement on the scale of: non-completion; little/superficial progress; variable progress, struggle at the beginning then progress; and continuous progress throughout.

The results of the ordinal logistic regression analysis show a significant improvement in the fit of the model over the null model, $\chi^2(4) = 66.1$, $p < .001$ and the model predicted 5% of variance in the treatment progress.

Childhood maltreatment was a significant negative predictor of treatment progress, $\chi^2(1) = 59.574$, $p < .001$. For every one unit increase on the childhood maltreatment, there is a predicted decrease of .389 in the log odds of participants being in a higher (as opposed to lower) category of treatment progress. This indicates that a man scoring higher on childhood maltreatment were more likely to make less progress in treatment.

Neither of the three maladaptive personalities (psychopathic, antisocial, and borderline) were significant predictors in this model. Model coefficients are presented in the Table 8.

Table 8

Model Coefficient from the Ordinal Logistic Regression

							95% CI	
Predictor	χ^2	*df*	*B (SE)*	*z*	*p*	Odds ratio	Lower	Upper
Maltreatment	59.574	1	-.39 (.05)	-7.463	< .001	.678	.611	.750
TriPM	3.529	1	-.01 (< .01)	-1.870	.061	.990	.979	1.000

Predictor	χ^2	*df*	*B (SE)*	*z*	*p*	Odds ratio	95% CI	
							Lower	Upper
Antisocial	1.427	1	.01 (< .01)	1.196	.232	1.008	.995	1.020
Borderline	.031	1	< .001 (< .01)	-.176	.860	.999	.991	1.008

Note: CI = confidence interval. TriPM = Triarchic Psychopathy Measure.

The model shows that it was able to significantly differentiate between participants who have either not completed the treatment, the participants who showed little/superficial or variable progress, and the participants who struggled from the beginning and then progressed well. However, the model could not differentiate between the participants who had struggled at first but then progressed well and those who showed continued progress throughout the treatment (see Table 9).

Table 9

Model Thresholds

Threshold	*B (SE)*	*z*	*p*	Odds ratio
0 | 1	-2.97 (.55)	-5.40	< .001	.05
1 | 2	-2.24 (.54)	-4.13	< .001	.11
2 | 3	-1.47 (.54)	-2.74	.006	.23
3 | 4	-.01 (.54)	-.02	.985	.99

Note: 0 = non-completion; 1 = little/superficial progress; 2 = variable progress, 3 = struggle at the beginning then progress; and 4 = continuous progress throughout treatment.

Modeling Maladaptive Personality Traits as a Latent Factor in the Context of Maltreatment and Treatment Progress

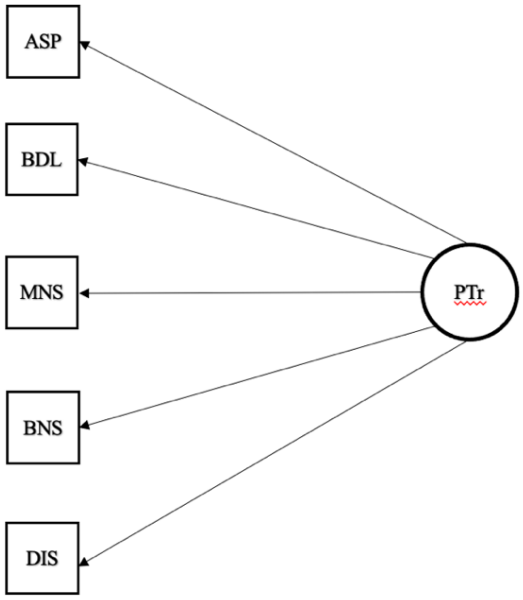
Structural equation modeling (SEM) was used to answer the second research question on how childhood maltreatment is related to the treatment of violent offending taking maladaptive personality traits into account. SEM is a multivariate statistical analysis based on factor analysis and multiple regression analysis and is used to analyse the structural relationships between observed variables (e.g., treatment outcome and childhood maltreatment) and latent construct (e.g., maladaptive personality traits). The sample size is suggested to be at least 10 cases per variable (Wolf et al., 2013); however, weak or strong regressive effects may require larger samples. Considering this, the current study has a large enough sample ($N = 417$) to be able to obtain sufficiently accurate estimates.

The SEM analysis is based on data from 417 men who had attended the Department of Corrections' Special Treatment Unit Programme. No outliers were removed and there were no missing data in the sample. As reported in Table 1, the normality of the sample distribution was not met, therefore the bootstrapping method was used (Gana & Broc, 2019; Kline, 2016). This means that rather than sampling from the population distribution, the bootstrapping resamples from our sample distribution (Jose, 2013). The bootstrap function resampled 1000 times, and thus more reliable estimates of sampling distribution were likely obtained.

Before analysing the hypothesised SEM, the measurement model was tested first to establish the pattern of observed variables (i.e., disinhibition, boldness, meanness, antisocial, and borderline traits) for the maladaptive personality traits latent construct as depicted in Figure 1.

Figure 1

Proposed Measurement Model

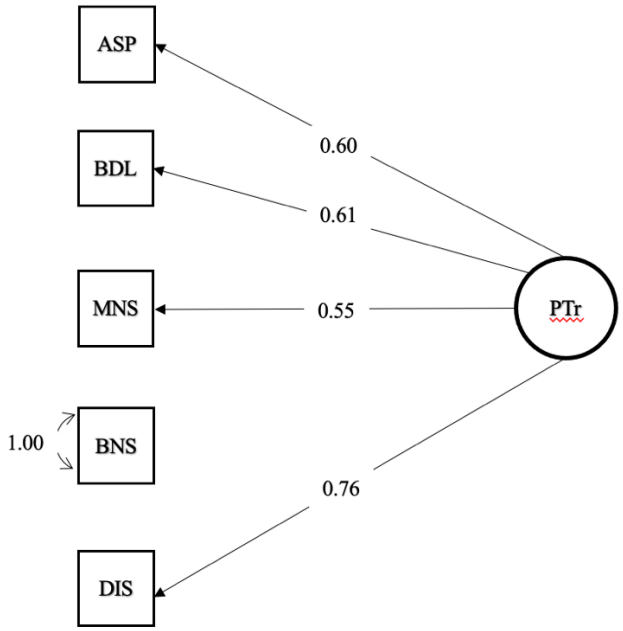


Note. PTr = maladaptive personality traits; ASP = antisocial personality; BDL = borderline; MNS = meanness; BNS = boldness; DIS = disinhibition.

In addition to the goodness of fit (χ^2), the acceptability of the model was determined by the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error approximation (RMSEA). The measurement model showed a not good fit $\chi^2(5) = 21.849$, $p < .001$, CFI = .948, TLI = .897, RMSEA = .09. Boldness was constrained to 1 and did not show a significant association with the latent variable maladaptive personality traits. The paths are depicted in Figure 2 and summarised in Table 10.

Figure 2

Measurement Model



Note. PTr = maladaptive personality traits; ASP = antisocial personality; BDL = borderline; MNS = meanness; BNS = boldness; DIS = disinhibition.

Table 10

Measurement Model Results

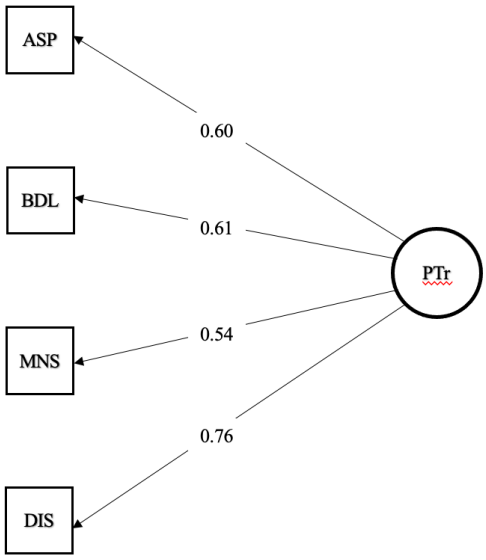
Observed variable	Latent construct	Estimate *(SE)*	*p*	β	95% CI
Disinhibition	PTr	1.00 (.00)	–	.76	[1.00 – 1.00]
Boldness	PTr	.02 (.06)	.715	.02	[-.08 – .135]
Meanness	PTr	.68 (.09)	< .001	.55	[.54 – .87]
Borderline	PTr	1.69 (.17)	< .001	.61	[1.40 – 2.04]
Antisocial	PTr	1.64 (.16)	< .001	.60	[.90 – 1.54]

Note: CI = confidence interval. PTr = maladaptive personality traits.

Based on these results, the boldness observed variable was removed and the measurement model was tested again. The model including disinhibition, meanness, borderline, and antisocial personality observed variable for the maladaptive personality traits latent variable fit data well, $\chi^2(2) = 5.657$, $p = .059$, CFI = .988, TLI = .965, RMSEA = .066. The paths are depicted in Figure 3 and summarised in Table 11.

Figure 3

Updated Measurement Model



Note. PTr = maladaptive personality traits; ASP = antisocial personality; BDL = borderline; MNS = meanness; BNS = boldness; DIS = disinhibition.

Table 11

Updated Measurement Model Results

Observed variable	Latent construct	Estimate *(SE)*	*p*	β	95% CI
Disinhibition	PTr	1.00 (.00)	–	.76	[1.00 – 1.00]
Meanness	PTr	.70 (.07)	< .001	.54	[.54 – .83]

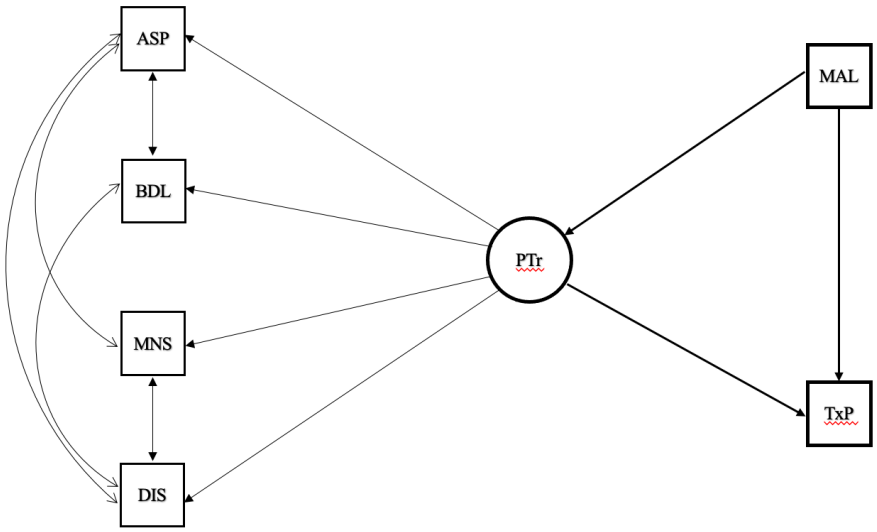
Observed variable	Latent construct	Estimate *(SE)*	*p*	β	95% CI
Borderline	PTr	1.68 (.16)	< .001	.61	[1.39 – 2.01]
Antisocial	PTr	1.19 (.15)	< .001	.60	[.91 – 1.50]

Note: CI = confidence interval. PTr = maladaptive personality traits.

The hypothesised SEM is graphically presented in Figure 4. For ease of differentiating between the components, the measurement component is depicted by thin arrows and the structural component by boldfaced arrows. The latent variable is represented by the circle and the observed variables by the rectangles. Covariations between the observed variables were derived from the measurement model results. A zero-correlation order for the study variables are shown above in Table 1.

Figure 4

Hypothesises Structural Equation Model



Note. Boldfaced arrows indicate structural component. MAL = childhood maltreatment; TxP = treatment progress; PTr = maladaptive personality traits; ASP = antisocial personality; BDL = borderline; MNS = meanness; DIS = disinhibition.

The model fit the data well, $\chi^2(3) = 3.041$, $p = .385$, CFI = 1.000, TLI = .000, RMSEA = .006. Theoretically informative paths are summarised in Table 12 and depicted in Figure 5. Overall, the model accounted for a substantial proportion in variance which was explained by meanness ($R^2 = .29$), borderline traits ($R^2 = .28$) and treatment progress ($R^2 = .15$). Disinhibition ($R^2 = .06$) and antisocial traits ($R^2 = .01$) only accounted for a small amount of variance. Greater maltreatment was significantly associated with lower levels of treatment progress β = -.35, $p < .001$, 95% CI [-.35, -.19]. There were no significant associations between the maltreatment and maladaptive personality traits and between maladaptive personality traits and treatment progress.

Table 12

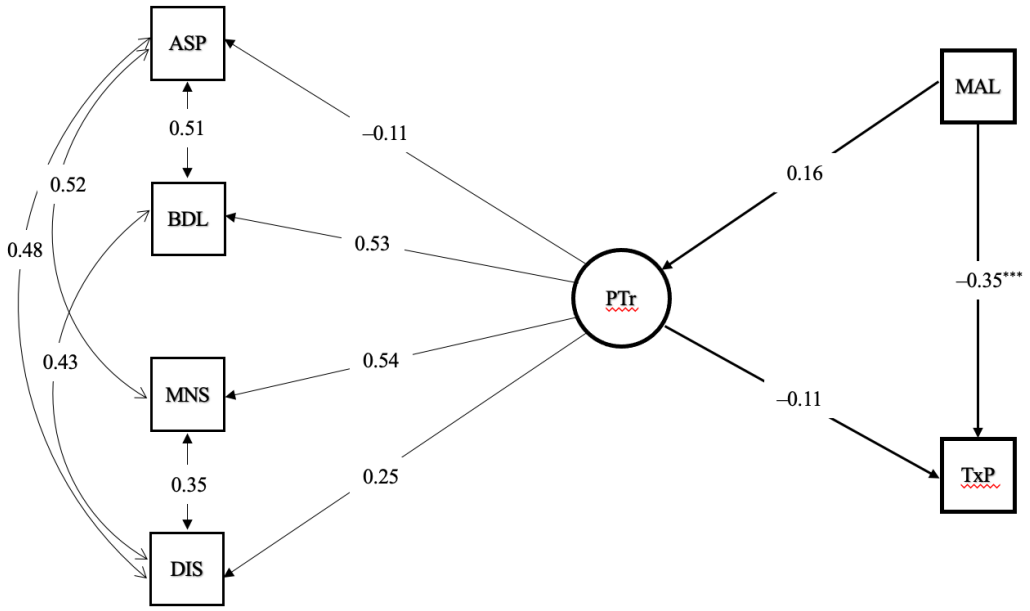
Measurement model results

Observed variable	Latent construct	Estimate *(SE)*	*p*	β	95% CI
Disinhibition	PTr	1.00 (.00)	–	.25	[1.00 – 1.00]
Meanness	PTr	2.06 (8.13)	.800	.54	[.39 – 14.2]
Borderline	PTr	4.28 (62.79)	.944	.53	[.35 – 24.27]
Antisocial	PTr	-.66 (26.79)	.980	-.11	[-11.71 – 6.05]

Note: CI = confidence interval. PTr = maladaptive personality traits.

Figure 5

Structural Equation Model



Note. Boldfaced arrows indicate structural component. MAL = childhood maltreatment; TxP = treatment progress; PTr = maladaptive personality traits; ASP = antisocial personality; BDL = borderline; MNS = meanness; DIS = disinhibition. Coefficients presented are standardised linear regression coefficients.

***p < .001

Additional Analysis

Observed Pattern Configurations for Treatment Progress and Types of Maltreatment

Based on the logistic regression, childhood maltreatment was a significant predictor for treatment progress. Maltreatment consisted of seven different types: physical, emotional, and sexual abuse; neglect of supervision and neglect of necessities; witnessing violence; and time spent in the state care. The variable used in the regression encoded how many different

types were present for each individual. Based on the result, the question arises whether there are any specific associations between the treatment progress and different types of maltreatment, and whether specific pattern configurations of maltreatment types and treatment progress may be observed more or less often than statistically expected. This was tested with a configural frequency analysis (CFA; Stemmler, 2020).

Due to a large number of variables (i.e., seven types of maltreatment and five levels of treatment progress), and consequently over 640 potential pattern configurations, which is not suitable for a conclusive CFA, the first step was to reduce the number of variables by combining different types of maltreatment based on the exploratory factor analysis. Out of seven types of maltreatment (physical, emotional, and sexual abuse; two types of neglect; witnessing violence; and time spent in state care), the time spent in state care was removed prior to exploratory factor analysis, as from the original coding (i.e., 1 = present, 2 = absent) it was not possible to conclude whether the event was of a traumatic nature or not. The remaining variables (i.e., three types of abuse, two types of neglect, and witnessing of violence) loaded onto three distinct factors, with the factor loadings ranging from .61 to .79. Based on these results from the exploratory factor analysis, three new variables were created: NEG – combining the two types of neglect: no necessities and no supervision; PAW – combining physical abuse and witnessing violence; and ESA – combining emotional and sexual abuse. The new variables were recoded to 0 – absent and 1– where at least one type of maltreatment was present. The three new binary variables and the treatment progress with five levels (0 = non-completion; 1 = little/superficial progress; 2 = variable progress, 3 = struggle at the beginning then progress; and 4 = continuous progress throughout treatment) were then included in a CFA (testing 40 different pattern configurations).

Observed values were compared with expected values and the global chi-square was significant, $\chi^2(28) = 118.26$, $p < .001$, which suggests there were significant differences between expected and observed patterns.

The results showed that the pattern configuration of continuous treatment progress – the highest level of progress (variable level 4) – and the presence of all types of maltreatment was observed less frequently than expected (Antitype). However, the pattern of a continuous treatment progress and the presence of either physical abuse and witnessing violence, or the presence of both types of neglect, were observed more frequently than expected, which is considered to be a Type (see Table 13). Interestingly, the most frequently observed pattern configuration (though statistically expected) was the non-completion of treatment in the presence of all types of maltreatment: physical, emotional, and sexual abuse; witnessing violence; and the two types of neglect (no supervision and no necessities).

Table 13

Configuration Frequency Analysis Results

Pattern configuration				Number observed	Expected	Type[a]	*df*	χ^2	*p*
TxP	PAW	ESA	NEG						
4	0	0	1	16	6.01	+	1	4.072	< .001
4	1	0	0	15	4.75	+	1	4.705	< .001
4	1	1	1	9	35.77	–	1	-4.476	< .001
0	1	1	1	78	78				*ns*

Note: TxP = treatment progress (level 4 = continuous progress throughout treatment); PAW = physical abuse and witnessing violence; ESA = emotional and sexual abuse; NEG = neglect of necessities and supervision. *ns* = not statistically significant.

[a] + denotes type (observed frequency > expected frequency) and – denotes antitype (observed frequency < expected frequency)

Discussion

This study aimed to explore the role of personality factors in the relationship between childhood traumatic events and treatment progress in New Zealand's high-risk male forensic population, who undertook the treatment of violent offending as part of their rehabilitation plan. Specifically, the focus was on the role of the three types of maladaptive personality traits: antisocial; borderline; and psychopathic. The expectation was to extend Te Hiwi's (2020) findings of the negative relationship between childhood trauma and treatment outcomes, hypothesising that maladaptive personality traits would mediate this relationship. It was also expected to find a positive relationship between traumatic childhood experiences and maladaptive personality traits, and a negative relationship between traumatic childhood experiences and treatment progress (e.g., treatment engagement and completion). The structural equation model analysis showed a significant negative relationship between childhood trauma and treatment outcomes. However, no significant relationship was found between childhood trauma and the three types of maladaptive personality traits, and no significant relationship between maladaptive personality traits and treatment progress. A discussion of the key findings is presented below.

Childhood Traumatic Events and Treatment Progress

Across the three different types of the analysis – binomial and ordinal logistic regressions, and the structural equation modeling, the results consistently show a significant negative relationship between childhood trauma and treatment of violent offending. That is, high-risk men who reported a higher number of childhood traumatic events were less likely to do well in treatment. Binomial logistic regression showed that childhood maltreatment was a significant predictor of the likelihood of whether men completed the treatment or not.

Those men who reported more childhood traumatic events were less likely to complete the treatment for violent offending, than men who reported less such traumatic events. Likewise, the ordinal logistic regression findings showed that childhood maltreatment was found to be the sole predictor of men's treatment progress. Men who reported more childhood traumatic events were less likely to progress well throughout the treatment. Both logistic regression models, which included maltreatment and the three maladaptive personality traits (i.e., antisocial, borderline, and psychopathic), had a good fit, though they explained only 7% of the variance in the treatment outcome and 5% of the variance in the treatment progress. This suggests that although maltreatment increases the likelihood of poorer treatment progress or greater treatment attrition, it does not explain fully why some men progress well throughout the treatment and why others have a more difficult path. Multiple factors and their interactions likely implicate treatment progress, rather than one factor only (Olver et al., 2011). Sturgess et al., (2016) in their literature review identified two overarching factors which affected the treatment – internal and external factors. The internal factors encompassed cognitive, affective, motivational, personality, and behavioural factors, while the external factors included the environment such as safety, staff attitudes, rapport, treatment location and disruptions. Therefore, childhood traumatic events, though occurring in the past, may be just one of the multiple factors which negatively affect the treatment.

A closer look into the ordinal logistic regression analysis, in particular its threshold model, showed that prediction of the treatment progress was significant only for the men who showed severe to variable struggle in treatment. However, the model was not able to differentiate between those who showed any kind of continuous progress. This suggests the effects of childhood traumatic events may be particularly pertinent to those men who struggle in treatment or to those who exit treatment. In support of this, the dose-response relationship suggests the greater and the more recurrent the trauma, the more complex and pervasive the

effects are on the individuals' psychological and biological developments (Boland et al., 2020; Degli Esposti et al., 2020; Streeck-Fischer & van der Kolk, 2000; Van Der Kolk, 2005). Such deficiencies in development are likely to have an effect on individuals' daily functioning and their interactions with the environment. Therefore, they are likely to struggle in treatment the most. On the contrary, men who experienced less pervasive or a single-occurrence trauma, may show more adaptive functioning and, as such, trauma may have no implication on their progress in treatment.

Trauma Types and Treatment Progress Association Patterns

Overall, the results consistently found a relationship between childhood traumatic events and treatment progress. This raised a question whether there are any specific associations between the treatment progress and different types of trauma, and whether specific pattern configurations of trauma types and treatment progress may be observed more or less often than statistically expected. The results of the additional, configural frequency analysis suggested continuous progress throughout the treatment, in the presence of all types of maltreatment – physical, emotional, and sexual abuse, witnessing violence, and two types of neglect: necessities and supervision, – was observed less frequently than expected. Furthermore, progress throughout the treatment in the presence of either neglect only, or physical abuse and witnessing violence combined, was observed more frequently than expected. By far the most frequent pattern configuration was the non-completion of treatment in the presence of all types of maltreatment, though the observed rate did not significantly deviate from the expected rate. These findings align with research suggesting the greater the trauma, the more pervasive and lasting the impact on the individual (e.g., Boland et al., 2020; Degli Esposti et al., 2020; Streeck-Fischer & van der Kolk, 2000) and subsequently on their engagement with treatment (e.g., Kolla et al., 2014; McCarthy & Duggan, 2010; O'Brien &

Daffern, 2017; Romero-Martínez et al., 2016; Schroeder et al., 2013). Interestingly, in this current study, the occurrences of continuous treatment progress in the presence of neglect alone or in the presence of physical violence (experiences and witnessing) were more common than expected. Physical trauma receives much attention and importance in research; however, de Carvalho et al., (2015) found emotional trauma has a stronger association with dysfunctional personality traits, in particular with reduced cooperativeness. Nevertheless, de Carvalho et al. also found a strong association between neglect and reduced cooperativeness which is not consistent with the findings in the current study. It is possible the CFA results may be inconsistent with the research due to the grouping of different types of trauma. The groupings of trauma types were obtained by the exploratory factor analysis (EFA) which determines the interrelationship between the set of variables and reduces them to a smaller set of interdependent composite variables. As this is not how the types of trauma would naturally group, testing specific pattern configurations involving individual types of trauma may provide more explicit results. Though in our case, due to a large number of variables, the CFA did not produce statistically meaningful results, and therefore, the EFA derived composite variables were a better alternative.

In summary, the current study reaffirms Te Hiwi's (2020) findings showing that childhood traumatic experiences negatively impact treatment progress and outcomes for men with a history of violent offences. Hence, the next aim of this study was to test the mechanisms underlying this relationship, in particular, the role of the maladaptive personality traits.

Maladaptive Personality Traits' Effect on the Relationship Between Childhood Trauma and Treatment of Violent Offending

Initially, this study aimed to explore whether maladaptive personality traits mediate the negative relationship between childhood traumatic events and treatment progress. Alas, the mediation analysis did not meet one of the assumptions required, therefore, two logistic regressions were conducted instead – binomial and ordinal. The logistic regression is a predictive analysis, which predicts an outcome based on the predictor variables (Field, 2009). Therefore, the study assessed whether the maladaptive personality traits predicted the likelihood of the treatment progress and outcome (i.e., attrition). Binomial logistic regression findings showed that psychopathic traits were significant predictors of the likelihood of men's treatment attrition. That is, men who scored higher on psychopathic traits were less likely to complete treatment for violent offending. Antisocial and borderline personality traits did not add any significance to the expected treatment outcome. Similarly, neither of the three maladaptive personality traits in the ordinal logistic regression – antisocial, borderline, and psychopathic – showed any significance in the prediction of the likelihood of treatment progress.

Interestingly, in the binomial logistic regression, psychopathic traits were a relevant contributor to the likelihood of men's treatment attrition, however, in the ordinal logistic regression, they appeared to have no impact on men's treatment progress. Scientifically, little is still understood about the effectiveness of treatment for individuals high on psychopathic traits (Larsen et al., 2020; Polaschek, 2015). Nevertheless, studies suggest that rehabilitation is, to some extent, effective for those high on psychopathic traits, as it is for other individuals with a high risk of reoffending (e.g., Polaschek & Daly, 2013; Wilson & Tamatea, 2013). It is also agreed that individuals high on psychopathic traits are likely to experience some

challenges in treatment due to their complex personalities (O'Brien & Daffern, 2017; Reidy et al., 2015). For example, the meanness aspect of psychopathy is characterised by challenges in problem recognition (Salcido et al., 2019). This suggests that men may fail to recognise the negative consequences of their problematic behaviour which, over time, may lead to the termination of their treatment. The evidence shows that almost 80% of men exited the Special Treatment Unit Rehabilitation Programme because of their problematic behaviour (Te Hiwi, 2020). Therefore, perhaps it is not the psychopathic traits as a whole that affect the treatment progress, rather it may be the meanness aspect of the psychopathy that plays a part in the outcome of men's treatment.

With the exception of psychopathic personality traits which were a predictor of the treatment outcome, the maladaptive personality traits were not predictors of treatment outcome and treatment progress. These findings are not in accordance with the existing empirical evidence which suggests that maladaptive personality traits negatively impact treatment (e.g., Kolla et al., 2014; McCarthy & Duggan, 2010; O'Brien & Daffern, 2017; Romero-Martínez et al., 2016; Schroeder et al., 2013). In the current study, antisocial and borderline personality traits were based on men's scores from the Millon Clinical Multiaxial Inventory (MCMI; Millon et al., 2009, 2015) and the lower reliability observed in this study sample compared to developers' sample may explain some of the discrepancies in the findings. The internal consistency reliability for the MCMI-III and MCMI-IV scales overall were ranging from acceptable to good. This is similar to developers' samples which show good internal consistency for both measures (Millon et al., 2009, 2015). Although the overall internal consistencies between the two samples were not significantly different, there were significant differences found in the reliability of numerous individual scales (e.g., avoidant, dependent, histrionic, narcissistic, somatoform, drug and alcohol dependence, major depression, and dysthymia). These sub-scales were less reliable in the current sample

compared to the developers' samples. The antisocial and borderline scales in the study sample showed acceptable to good internal consistency, though when compared to the developers' sample, the internal consistency of the borderline scale was significantly less reliable in the current sample. Additionally, the correlation comparison of the MCMI-III and MCMI-IV base rate scores for the scales showed the current study sample correlations were overall significantly lower for most of the scales – including antisocial and borderline – when compared to the developers' samples.

There are several possible reasons for the observed differences in the reliability between the two samples. For example, the MCMI measures were developed for – and validated on – the clinical population, while the current sample was based on the forensic population. The MCMI-III validation sample included only about 8% of forensic participants (Millon et al., 2009), while the MCMI-IV validation included no forensic participants (Millon et al., 2015). Empirical studies on the reliability of the MCMI measures in forensic samples are scarce, in particular, there appears to be a paucity of research on the MCMI-IV. While the MCMI measures used with a forensic population may offer some value by highlighting the maladaptive personality traits patterns and risk of criminality (Rossi et al., 2003; Sissons, 2013), its use in a forensic population should be applied with caution. Furthermore, the developers' sample consisted of predominantly White participants (e.g., 86.7% for the MCMI-III and 72.4% for the MCMI-IV), and only a small percentage (1.5%) of Native Americans was reported in the MCMI-III sample and none in the MCMI-IV sample. The current study, based on the Department of Corrections' ethnicity reports, suggests that more than half of the sample (64.3%) were of Māori descent, while a smaller percentage (25.2%) were White European. To date, neither the MCMI-III nor the MCMI-IV was validated for use with ethnic minorities, thus, caution was advised if the tools should be used with non-White individuals (Wenzel, 2017).

In summary, maladaptive personality traits were not predictors of treatment progress and outcome, despite men who were high on psychopathic traits being less likely to complete the treatment. Meanness aspect of psychopathy, with its challenges in problem recognition, was identified as a possible contributor to behavioural problems which are commonly reported as a reason for treatment attrition.

Modeling Maladaptive Personality Traits as a Latent Factor in the Context of Maltreatment and Treatment Progress

The maladaptive personality traits latent variable was initially constructed based on five observed variables – disinhibition, boldness, meanness, and antisocial and borderline traits. However, the measurement model for the latent variable did not have a good fit. That is, the boldness variable showed no direct path association with the latent variable but was rather independent of it. Comparably, the findings in a recent meta-analytical study reported boldness as an orthogonal construct of psychopathy (Sleep et al., 2019). The authors agree with other theorists (e.g., Lilienfeld et al., 2012; Patrick et al., 2009) that boldness is not a central component of psychopathy and that it shows little resemblance to other psychopathic traits. For example, meanness and disinhibition are highly correlated with antisocial personality disorder and are associated with maladaptive functioning, while boldness appears to be associated rather with adaptivity. Sleep and colleagues (2019) found boldness to be strongly related to emotional stability and stress immunity. Similarly, most recent findings suggest divergent validity between boldness and the other two aspects of the psychopathy – meanness and disinhibition (Roy et al., 2020). Here too, authors argue that boldness is associated with high extraversion, positive affect and low neuroticism, which suggests a relationship with a positive adjustment.

Based on these findings, a better fitting model using a maladaptive personality traits latent variable – now excluding boldness observed variable – was tested, along with the maltreatment and the treatment progress. Although the overall SEM model had a good fit, there was no significant path association between the maltreatment and maladaptive personality traits, and between the maladaptive personality traits and treatment progress. The only significant association found was between maltreatment and treatment progress. Interestingly, once the measurement model was added to the full SEM, the maladaptive personality traits latent variable was fully explained by borderline personality traits and by the two aspects of psychopathy – disinhibition and meanness. Antisocial personality traits added no additional value to the model; in fact, the variable showed a negative path association with maladaptive personality traits. The existing research commonly reports an overlap between antisocial, borderline, and psychopathic traits (e.g., Barese, 2016; Hunt et al., 2015; Lopez-Villatoro et al., 2018; Paris, 1997; Roy et al., 2020). For example, Hunt and colleagues suggested the factor two type psychopathy (i.e., impulsive lifestyle and antisocial tendencies; Hare, 2003) and borderline personality disorder overlap and share common risk factors (Hunt et al., 2015). Likewise, borderline personality disorder has been found to overlap with antisocial personality disorder, in particular with its impulsivity dimension (Paris, 1997). In the current study, it is likely that once boldness was removed from the SEM measurement model, the remaining two aspects of psychopathy (i.e., meanness and disinhibition) embodied only externalising behaviour and antisociality (Sleep, Weiss, et al., 2019). Once combined with the impulsivity and the antisociality aspects of borderline personality traits, they likely accounted for the majority of antisocial personality traits. That way, the antisocial personality traits observed variable possibly became redundant. In support of this, the structural equation model indicated that borderline personality traits and meanness combined accounted for 57% variance in the whole structural equation model.

Surprisingly, this study found no significant path association between maltreatment and maladaptive personality traits, though, numerous studies suggest the link (e.g., Ball & Link, 2009; Bohle & de Vogel, 2017; Carlson et al., 2015; DeLisi et al., 2019; Goddard & Pooley, 2019; Ibrahim et al., 2018; Sharp et al., 2020). One possible explanation for the discrepancies in findings is the type of maltreatment measure used in this current study. The maltreatment measure was a retrospective self-report extrapolated from the official psychological reports and such reports may reflect therapists' biased inferences (Bucci et al., 2012; Olino & Klein, 2015). That is, therapists may draw on their subjective experiences or expectations and may not objectively interpret the reported trauma. These reports may be further inferred by an intuitive reader. Therefore, self-reports, though also subject to bias (Olino & Klein, 2015), may be considered more objective. Self-reports are commonly used in studies screening for traumatic childhood experiences (Pinto et al., 2014), though, they are commonly obtained by a trauma-specific measures such as the Child Abuse and Trauma Scale (CATS; Sanders & Becker-Lausen, 1995), the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998), or the Adverse Childhood Experiences Questionnaire (Felitti et al., 1998). Given that this current study did not use a formal trauma-specific measure, it is difficult to compare the findings to other studies or to ascertain the accuracy and the reliability of trauma reporting.

Furthermore, in this study, different types of childhood traumatic events were summarised to form one variable – maltreatment. This variable accounted for the sum of the different types of events but did not account for the extent, or the severity, of those events. In other words, from the coding of the different trauma variables (i.e., 0 – absent, 1 – presents) it was only possible to conclude whether the event (e.g., physical abuse) took place or not. However, it was not possible to ascertain whether this was a single occurrence event or long-term frequent abuse, and it was also not possible to determine the severity of the event. It is

not uncommon for the studies to report on the number of trauma types only, rather than the frequency of them (Rocchio, 2020). However, profound differences have been suggested between single-event trauma and complex trauma (Teicher & Samson, 2016; Van Der Kolk, 2005). For example, single-event trauma leads to behavioural and biological reactions and, depending on its severity, it may subsequently result in post-traumatic stress disorder. On the contrary, chronic maltreatment or complex trauma has a detrimental and lasting effect on development, including the development of a child's mind and brain. In comparison to acute, single-event trauma, children who experienced complex trauma showed more generalised behavioural problems (Wamser-Nanney & Vandenberg, 2013). It was also suggested complex trauma leads to a surge in a range of chronic and complex issues, and increases the risk of further victimisation (Briere et al., 2008, 2016). Based on this, it is likely that the coding of trauma in the current study was not sufficiently exhaustive to capture the complexity of the trauma, which in turn, may have obscured the findings on the relationship between childhood traumatic events and maladaptive personality traits. Any future research should aim to capture the severity and the extent of the trauma to ensure more nuanced results.

In summary, maladaptive personality traits – antisocial, borderline, and psychopathic – showed no significant association either with the maltreatment or with the treatment progress. Boldness, consistent with the existing research, was found to be a distinct aspect of psychopathy and was independent of the maladaptive personality traits latent variable. On the other hand, meanness, disinhibition, and borderline personality traits subsumed the features of antisocial personality traits, and thus fully explained the maladaptive personality traits variable.

What Does This Mean for Current Practices?

The current study reaffirmed Te Hiwi (2020) findings which suggested that childhood traumatic events negatively impact the treatment progress and outcomes for men with a history of violent offences, though its underlying mechanisms remain uncertain. It was noted that at least one type of trauma was reported by the majority (over 96%) of men in the Special Treatment Unit Rehabilitation Programme, while close to 60% of men reported four or more types of trauma (Te Hiwi, 2020). This is consistent with studies which have shown increased reports of childhood trauma in incarcerated individuals when compared to the general population (Bevan, 2017; Gerrard & Lambie, 2018; Nesi et al., 2020). Given that childhood trauma is so prominent in the high-risk offending population, it should be considered an integral part of assessment (Mallett & Schall, 2019; Rocchio, 2020), in addition to the established assessment of the risk factors (Bonta & Andrews, 2017). To the best of my knowledge, the current practices in NZ correctional programmes utilise multifactorial etiological formulation; though, this does not include a trauma-specific measure. Introducing a trauma-specific measure (e.g., Childhood Trauma Questionnaire; Bernstein & Fink, 1998) as a part of the routine assessment may provide a range of benefits.

Accuracy of trauma reporting is a common concern (Baldwin et al., 2019; Craig, 2019; Danese & Widom, 2020). For example, in the current study, childhood trauma may be under- or over-reported as the men were not assessed until later in life. That is, the men may have forgotten, concealed, or perhaps even normalised their childhood adversities. Also, traumatic events may be associated with feelings of shame and embarrassment (Dalenberg et al., 2017; Rocchio, 2020) which may compromise men's disclosure or its accuracy. For that reason, assessing trauma through the use of the questionnaires may be less intimidating compared to psychological interview. The formal trauma-specific measures may serve as an

initial point of enquiry and may be supplementary to information gathered in a later interview. Secondly, although trauma-specific measures are not as comprehensive as the interview assessment, they are able to track changes in the reporting of trauma (Pinto et al., 2014). It is possible that engagement in a rehabilitation programme may stimulate the awareness of childhood adversities which may subsequently lead to over-reporting of trauma. For example, individuals may not recognise their history of childhood trauma until their engagement in treatment (Schauss et al., 2019). Treatment modules incorporating skills building (e.g., problem-solving) may promote an understanding of psychological processes and challenge individuals' normalised experiences of violence or neglect. This may, over time, increase the awareness of the history of childhood traumatic events. However, such changes in reporting are difficult to ascertain without a trauma-specific measure which enables the test-retest reliability analysis. Lastly, the use of the trauma-specific questionnaires would provide a more reliable measure for any future research related to childhood trauma in NZ forensic population.

Most importantly, the findings of this study reiterate the need for a better understanding of men's past traumatic experiences and their impact on treatment as they are essential to men's wellbeing and rehabilitation. For example, trauma may be a contributing factor to the development of men's thinking styles (e.g., Cuadra et al., 2014; Low & Day, 2017), schemas (e.g., Widom & Maxfield, 2001), and behaviours (de Carvalho et al., 2015). That is, trauma has likely shaped the men and their interactions with the environment, which includes the treatment of violent offending. Therefore, incorporating trauma in the assessment and treatment of men with a history of violent offences is to consider them as a whole person. Such a holistic approach to assessment and treatment is not only our ethical responsibility (New Zealand Psychological Society, 2012), but it is also aligned with the Department's Hōkai Rangi strategy – *"It's about the whole person approach, not*

management of symptoms or problems, but instead looking deeper into the why and the how." (Ara Poutama Aotearoa, 2019, p. 14). Therefore, understanding individuals' developmental history and its effects on emotional and behavioural stability might need to be considered along with the risk of reoffending, and before any attempts are made to treat the maladaptive behaviour (Livesley, 2012; Wilson & Tamatea, 2013).

Strengths and Limitations

To the best of my knowledge, this was the first study which aimed to directly investigate the effect of maladaptive personality traits, in particular antisocial, borderline, and psychopathic traits, on the negative relationship between early life trauma and treatment progress for men with a history of violent offending. Contributions to the NZ forensic psychology research field have been significant and are continuously growing (e.g., Fortune et al., 2014; Heffernan & Ward, 2019; Polaschek, 2019; Tamatea & Day, 2019), though NZ correctional practices are largely informed by the international research (i.e., Risk, Need, and Responsivity Model; Bonta & Andrews, 2017). Therefore, this study, based on a large NZ forensic sample, contributes to a better understanding of high-risk men with a history of violent offences and their rehabilitation. The findings in this study reiterate the need for ongoing research on the effects of trauma on the treatment of high-risk individuals, in particular, the need for further exploration of the underlying mechanisms in this relationship.

Likewise, it could be argued that the research based on a NZ forensic sample is a limitation, as results may not generalise to a wider, international population. The current study sample was built on a unique demographic and individuals who attended a specific-to-New Zealand treatment programme. However, the methodology of this research is

transferable, which is considered one of the models of generalisability in the field of research (Polit & Beck, 2010).

This study is not without its methodological limitations, and one such limitation is the coding of the maltreatment variable discussed earlier. Furthermore, only the reliability of the Millon Clinical Multiaxial Inventory (MCMI; Millon et al., 2009, 2015) measure was tested on the study population. Due to Covid-19 restrictions, I was unable to access the item scores for the Triarchic Psychopathy Measure (TriPM; Patrick, 2010) which were required for the reliability analysis. Like the MCMI measure, the TriPM has not been standardised on the NZ population and its reliability with this population remains largely untested. Additionally, the TriPM is widely used, though concerns exist regarding its structural validity (Collison et al., 2020; Roy et al., 2020; Stanton et al., 2020). For example, studies have identified poor statistical factor structure – including items with poor psychometric properties – and multidimensionality of TriPM's domains. As already discussed, the boldness aspect of the TriPM appears to be orthogonal and relates to the adaptivity, rather than to maladaptive coping. Furthermore, meanness and disinhibition aspects substantially overlapped which suggests poor discriminant validity of the scales (Roy et al., 2020). As the findings in this current study were inconsistent with the existing literature on the relationship between childhood trauma and maladaptive personality traits, it would be essential in any future studies to ascertain whether the TriPM is, in fact, a suitable and a valid measure for this population.

Additionally, two versions of the MCMI measures were used in this study: MCMI-III and MCMI-IV. Based on the presentation of the existing data, it was not possible to ascertain whether participants completed the MCMI-III or the MCMI-IV (i.e., only the base rate scores were provided for borderline and antisocial personality traits). Although the two MCMI

measures intend to capture the same personality traits, multiple changes occurred in the revision and development of the MCMI-IV. These changes may account for some of the variances in the results. For example, one of the major differences was the extension of the bandwidth of personality severity in the MCMI-IV. While the MCMI-III, aligned with the Diagnostic Statistical Manual 4th edition (DSM-IV; American Psychiatric Association, 2000), referred mainly to psychopathologies, the MCMI-IV now conceptualises each personality pattern on a spectrum, from more to less adaptive (Choca & Grossman, 2015). Also, in the MCMI-IV significant changes have been made to the number of items measuring each scale. For example, the number of antisocial personality scale items increased by five (from 9 to 14), while the number of borderline personality scale items more than doubled (from 9 to 20). This included rewriting some of the existing items. For clarity of the results, any future studies should aim to use data based only on the latest version of the measure – MCMI-IV.

Future Directions for Research

Given the routine use of the personality assessment measures with the NZ forensic population, despite their reliability and validity remaining largely untested in NZ context, it would be essential to undertake a comprehensive review of the measures (e.g., TriPM; Patrick, 2010 and MCMI-IV; Millon et al., 2015). Though this current study assessed the reliability of the MCMI tool, only the internal consistency reliability of the scales and the correlation scale comparisons were conducted. The internal consistency findings in this study indicated variable reliability when compared to developers' sample, however, this is not sufficient to establish whether the measure is suitable or not. Any future review of the assessment measures should include the evaluation of the tools' performance and their suitability with ethnic minorities. For this purpose, an in-depth inquiry should be undertaken to assess whether the questions used to form the measurement scales are suitable in the

context of a different worldview and tikanga. Little is known about the suitability of the MCMI and TriPM personality measures for their use with ethnic minorities (Grossman, 2019; Wenzel, 2017) and the validation samples are predominantly White (Millon et al., 2009, 2015; Patrick, 2010; Shepherd & Lewis-Fernandez, 2016). At the same time, the over-representation of individuals who identify as Māori in New Zealand's correctional system is well recorded (Department of Corrections, 2019). It was suggested that risk assessment tools validated on a predominantly White sample are not designed to account for culture and different world views (Tamatea, 2017) and the same may be true for the personality measures. For example, on the Minnesota Multiphasic Personality Inventory (Butcher et al., 2001) ethnic minorities appear to score higher compared to Caucasians (Arbisi et al., 2002; Benuto et al., 2020; Butcher et al., 2001). This is problematic as it may disadvantage individuals from ethnic minorities in a way that their level of risk and psychopathologies may be perceived as elevated. Subsequently, this may have further implications on their imposed sentence or the treatment received (Bonta & Andrews, 2017). In such a case, the individual's needs are not addressed correctly which may be considered a violation of cultural safety and subsequently a violation of human rights (Shepherd & Lewis-Fernandez, 2016). Therefore, it is essential for the personality assessment measures to undergo an extensive evaluation and validation for their use on the NZ forensic sample.

On balance, it is possible that assessing the effects of maladaptive personality traits on the relationship between childhood traumatic events and treatment of violent offending was a too broad approach. Conceptual and methodological issues are commonly raised regarding personality traits (Lilienfeld et al., 2019). For that reason, the focus should be on underlying mechanisms such as self-regulation, as it appears to be a feature common to those with antisocial, borderline and psychopathic traits (DeLisi et al., 2018; Dokucu & Cloninger, 2019; Moreira et al., 2020). Individuals who experienced childhood abuse or neglect may fail

to meet their developmental tasks (e.g., self-regulation) and may consequently develop maladaptive coping strategies (Cicchetti, 2016; Lackner et al., 2018; Masten & Cicchetti, 2010; Van Der Kolk, 2005; VanMeter et al., 2020). For example, maltreated children may perceive their environment as hostile and unpredictable (Cicchetti, 2016) which is perhaps true for the prison environment. Individuals with a history of trauma are likely to experience a high level of hyper-arousal in order to survive in such unpredictable and hostile environments (Cicchetti, 2016). Moreover, treatment modules, which incorporate offence mapping and challenge the offence-related thinking or emotions, may be (re-)traumatising and, combined with hyper-arousal, may exacerbate individuals' difficulties with self-regulation. This may be particularly pertinent to individuals who's childhood trauma was left untreated (Streeck-Fischer & van der Kolk, 2000). Thus, individuals are likely to show an increase in behavioural problems when faced with challenges in an unpredictable environment, which is supported by the evidence suggesting that men's behavioural problems were the most common reason for the treatment discontinuation (Te Hiwi, 2020). Therefore, in any future research, self-regulation may be a more relevant and attainable measure compared to a composite construct such as maladaptive personality traits.

Conclusion

This study demonstrated that traumatic childhood events negatively impact the progress of treatment for men with a history of violent offences. Men who reported more traumatic experiences were less likely to complete the treatment and showed less progress throughout the treatment. Maladaptive personality traits – antisocial, borderline and psychopathic – were found to have no significant role in the relationship between trauma and treatment progress in this study. Though, men who were high on psychopathic traits were less likely to complete the treatment. Further exploration of the data showed that treatment

progress, in the presence of all types of traumatic childhood events, was observed in the sample less frequently than statistically expected. Whilst the findings on maladaptive personality traits were largely inconsistent with the existing research, the study re-affirmed the negative effect of the childhood traumatic events on the treatment of violent offending. It reiterated the need for further research on the mechanisms involved in the relationship between childhood trauma and treatment of violent offending. A comprehensive understanding of this relationship may lead to more holistic, ethical and successful practices; it may further reduce reoffending rates and subsequently ensure safer societies and better lives for individuals and their whānau.

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Appendix

SEM Codes

#proposed measurement model (initial)

PTr=~DIS+BNS+MNS+BDL+ASP

#measurement model

PTr=~DIS+MNS+BDL+ASP

#regressions

PTr~MAL

TxP~MAL+PTr

#residual covariances

DIS~~MNS+ASP

MNS~~ASP

BDL~~DIS+ASP