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In addition to the above conditions, authors give their consent for the digital copy of their work to be used subject to the conditions specified on the Library Thesis Consent Form and Deposit Licence.
To date, there is a lack of literature focusing on the violence perpetrated by young females. Understanding the backgrounds and violence of female youth offenders can inform prevention and intervention services of their treatment needs. Thus the overall purpose of the current study was to investigate the backgrounds and characteristics of violent female youth offenders. The methodology involved a retrospective file audit of 184 female youth who were referred to the Regional Youth Forensics Service in Auckland. Data was analysed using both descriptive and inferential statistics. The first aim was to compare the demographic and psychosocial backgrounds of violent female youth to a group of female youth with nonviolent offence charges. Significant differences were found in only a few of the variables examined. The second aim was to compare and contrast the backgrounds and offence characteristics of the violent female youth on three dichotomous variables: motivational subtype of violence (instrumental or reactive), victim subtype (family or community), and ethnicity (Māori or Pākehā). Māori ethnicity was associated with increased odds of engaging in instrumental violence, whereas Pākehā ethnicity was associated with increased odds of engaging in reactive violence. Having siblings involved in crime, a history of perpetrating bullying, peer involvement in their offence and community victims (opposed to family victims) were associated with increased likelihood of instrumental violence. Having family victims was associated with increased likelihood of reactive violence. Māori youth were associated with increased likelihood of victimising community members whereas Pākehā youth were associated with increased likelihood of victimising family members. A history of being victim to bullying, and having adult-aged victims were associated with an increased likelihood of victimising family members. The variables school exclusions, gang involvement, peer involvement in the offence and having youth/child aged victims were associated with an increased likelihood of victimising community members. The presence of a substance use disorder, sibling criminality, and being intoxicated at the time of the offence were associated with offending by Māori, whereas anger problems and poor social skills were associated with Pākehā offending. Overall the findings suggest that violent female youth are a heterogeneous population and treatment needs should be considered accordingly.
This thesis is dedicated to the children of Aotearoa

Take care of what they hear,
Take care of what they see,
Take care of what they feel,
For how the children grow,
So will be the shape of Aotearoa
-Dame Whina Cooper
My sincere gratitude goes to my supervisors Associate Professor Ian Lambie and Professor Fred Seymour for their guidance and encouragement throughout this project. Thank you also to the university statistics department for all of the valuable statistics advice.

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My biggest thanks would have to go to my partner Paul for his endless support and tolerance of the countless times I said “Sorry I can’t [insert fun activity], I have to work on my thesis”. I am forever grateful for your love and support; you are the most selfless person I know.
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CHAPTER ONE: INTRODUCTION

Background

Violent female youth offending is a complex phenomenon, which occurs within a constellation of social dynamics. Research has shown a strong tendency for female antisocial behaviour to unfold against a backdrop of serious family related risk, including multiple traumatic experiences and often extensive histories of victimisation. Female youth offenders often present with multiple mental health problems and regular alcohol and substance use is also ubiquitous and embedded in their social landscapes. The numerous and intricate issues female youth offenders present pose a profound challenge for treatment services.

My interest in the violence perpetrated by female youth stems from an incident in my adolescence where I was physically assaulted by a group of three female youth, unprovoked and in broad daylight. This ignited my curiosity about what the backgrounds of these girls were and how they ended up in the position where they could perpetrate such violence, with such ease, and with seemingly no remorse. After my undergraduate degree I went on to work at a youth justice residence where the complexity and difficulty of working with the female youth was striking. The unjust disparity between my own upbringing and the backgrounds of many of these youth resonated with me and cemented my desire to want to understand and help these youth take a different path. Returning to study clinical psychology, I was presented with the opportunity to extend my interest in this area.

To date, there is a lack of literature focusing on the violence perpetrated by young females. International and New Zealand (NZ) trends indicate that female adolescents may be increasingly engaging in violent behaviour (Crawford & Kennedy, 2008; Federal Bureau of Investigation (FBI), 2004; Holmes, 2010), thus there is an urgency to better understand violence in this group. There is also a need for a deeper understanding of the heterogeneity of female violence (Babcock, Miller, & Siard, 2003). Furthermore the literature on aggression and violence indicates that individuals who perpetrate different types of violence may have different treatment needs (Babcock et al., 2003).

Investigating diverse types of aggression is necessary to enhance our understanding of aggressive behaviour in youth (Connor, Steingard, Cunningham, Melloni, & Anderson, 2004). Accordingly, this thesis investigated the heterogeneity of violent female youth offenders amongst a sample of youth referred for assessment at the Regional Youth Forensics Service.
(RYFS) in Auckland. The first aim was to describe the background characteristics and experiences of the violent female youth. These youth were also compared to youth who had offended in a nonviolent manner (e.g., theft, substance related offences) to identify if there were any factors that distinguished violent from nonviolent offending youth. Another aim was to investigate if female youth differed when grouped according to the motivation for their violence. The constructs of instrumental and reactive aggression were used for this comparison.

Instrumental and reactive aggression are correlated forms of aggression, however the distinction between the two is supported by different explanatory theories and empirical evidence that has found them to be differentially related to a range of social and behaviour outcomes (Card & Little, 2006) and contextual factors (Fite, Wimsatt, Elkins, & Grasetti, 2012). It was deemed important to investigate the contextual, social and behavioural correlates of reactive and instrumental aggression subtypes, as information on unique needs may be useful for the refinement and implementation of intervention strategies.

Within the literature on adolescent violence there is also increasing research on a concerning group of adolescents who perpetrate violence against their families (Elliot, Cunningham, Colangelo, & Gelles, 2011). There are some indications that they may differ from other offending or conduct disordered adolescents (Ibabe & Jaureguizar, 2010; Nock & Kazdin, 2002). Adolescent to parent violence has been cited as a neglected form of family violence (Walsh & Krienert, 2009). The existing studies often compare youth who perpetrate violence against their parents/family members with other youth who do not exhibit these behaviours at all, rather than with only those youth who are violent in the community. Little is known about how their risk factors and treatment needs may differ. As family violent and community violent youth often end up in the same services, identifying unique treatment needs is important. Hence, a further aim of this thesis was to investigate if female youth differed when grouped according to the relationship with their victims, namely, if their victim was a family member or a member of the community.

Another avenue of violence that warrants further investigation is its relationship to ethnicity. Although some studies have investigated the differences between male and female offenders, other researchers have criticised that these studies run the risk of “gender essentialism” which refers to “the faulty assumption that gender is the only defining factor in female criminality” (Makarios, 2007, p. 103). Furthermore, grouping all females together fails to recognise the potential importance that ethnicity and social class play in shaping the criminal behaviours of female youth (Burgess-Proctor, 2006; Potter, 2006) and reduces the chance of discovering patterns of offending behaviours and backgrounds that are specific to certain ethnic
groups. In NZ, over-representation of young Māori females in the youth justice system is a pressing issue, and they are heavily over-represented in statistics of violent offending (Crawford & Kennedy, 2008). Thus, a closer look at what distinguishes this population (if anything) is important. Māori disproportionately live in the more deprived areas of NZ (White, Gunston, Salmond, Atkinson, & Crampton, 2008) and the consequent disparate resource base has given rise to some profound health and social consequences for Māori (White et al., 2008).

Considering the socio-political and historical experiences of Māori, it may not be unexpected that aggression that arises for Māori youth may have contextual and developmental pathways/risk factors indicative of unique treatment needs that should inform targeted intervention. The final aim of this thesis, therefore, was to investigate if Māori and Pākehā youth differed according to the variables of interest. Developing an understanding of the potentially different treatment needs and pathways to offending could impact positively on prevention initiatives, identification, assessment and the advancement of culturally appropriate interventions for Māori youth.

The purpose of this chapter is to provide a rationale for investigating the heterogeneity of female youth violence in a NZ sample of female youth offenders. The chapter begins with a review of international and NZ prevalence rates and trends in female youth offending. An overview of the literature on the risk factors for female antisocial behaviour follows, and is presented in individual, family, peer, school and wider community contexts. The psychological wellbeing of female youth offenders is then discussed, outlining the range of mental health concerns and substance abuse problems which are ubiquitous in this population. Following this overview, the focus narrows to female youth violence. Factors that are related to violence are reviewed and the constructs of instrumental and reactive aggression are introduced, followed by a review of their socio-developmental and psychosocial correlates. A section on victim-offender relationship outlines the characteristics of adolescents who perpetrate violence against their families. Ethnic discrepancies found in the research are woven throughout the review. A brief review of the prominent prevention and intervention efforts is also provided, as the risk factors and correlates of different violent profiles identified in the present study may have implications for intervention efforts.
The Extent of the Problem – Trends in Female Youth Offending

**International Trends**

International rates of female youth offending indicate that this may be an increasing problem. In the United States between 1980 and 2003, overall nationwide arrest rates for girls increased by 43%, whereas arrests for boys decreased by 10% (Federal Bureau of Investigation (FBI), 2004). Specifically, arrests for girls for severe violent offences (homicide, rape, robbery and aggravated assault) increased by 75%, compared to an 11% decrease for boys. Arrest rates for less severe simple assaults increased over this period by 318% for females and 130% for males.

A recent Australian study in the New South Wales region (Holmes, 2010) investigated female youth offending over a 10-year period, from 1999 to 2009. While the youth offending rates had significantly grown for both sexes, the increase for females (36%) was substantially higher than the increase for males (8%). For females, significant increases were observed in the number of non-domestic violent assaults (up 4% each year), liquor offences (up 3% each year) and shoplifting offences (up 1% each year). The number of male youth committing these offences remained stable or decreased. Overall, Holmes concluded that more females had offended over the past decade, and the offences committed were of a more violent nature. The possible explanations for these trends will be considered following a review of NZ trends.

**New Zealand Trends**

Before discussing NZ trends in female offending, an overview of the offence classes for female youth is provided. Most child and youth apprehensions are for property offences, which comprise approximately 69% of all apprehensions (Ministry of Justice, 2010). Table 1 displays the offence class of females aged 14–16 from the years 2006–2010. As can be seen in Table 1, the vast majority of apprehensions were for theft and related offences. However, a notable number of offences involved acts intended to cause injury.
Table 1

Offence Class for Females Aged 14–16 Years Apprehended from the Years 2006–2010

<table>
<thead>
<tr>
<th>Offence class</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicide and related offences</td>
<td>7</td>
<td>0.02</td>
</tr>
<tr>
<td>Acts intended to cause injury</td>
<td>5130</td>
<td>14.3</td>
</tr>
<tr>
<td>Sexual assault and related offences</td>
<td>23</td>
<td>0.1</td>
</tr>
<tr>
<td>Dangerous or negligent acts endangering persons</td>
<td>29</td>
<td>0.1</td>
</tr>
<tr>
<td>Abduction, harassment, and other related offences against a person</td>
<td>1053</td>
<td>2.9</td>
</tr>
<tr>
<td>Robbery, extortion, and related offences</td>
<td>553</td>
<td>1.5</td>
</tr>
<tr>
<td>Unlawful entry with intent/burglary, break and enter</td>
<td>2000</td>
<td>5.6</td>
</tr>
<tr>
<td>Theft and related offences</td>
<td>16047</td>
<td>44.6</td>
</tr>
<tr>
<td>Fraud, deception and related offences</td>
<td>927</td>
<td>2.6</td>
</tr>
<tr>
<td>Illicit drug offences</td>
<td>1228</td>
<td>3.4</td>
</tr>
<tr>
<td>Prohibited and regulated weapons and explosives offences</td>
<td>358</td>
<td>1.0</td>
</tr>
<tr>
<td>Property damage and environmental pollution</td>
<td>2886</td>
<td>8.0</td>
</tr>
<tr>
<td>Public order offences</td>
<td>4369</td>
<td>12.2</td>
</tr>
<tr>
<td>Offences against justice procedures, government security and government operations</td>
<td>1239</td>
<td>3.4</td>
</tr>
<tr>
<td>Miscellaneous offences</td>
<td>123</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total offences</strong></td>
<td>35,972</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Offending behaviours in NZ can be measured by two indicators: (1) police apprehension rates and (2) proved outcomes in the Youth Court or convictions received in the District or High Court (Ministry of Justice, 2010).

Police apprehensions are recorded when a young person has been involved with the police in some manner to resolve an alleged offence. Police apprehensions provide a measure of the incidence of apprehensions for alleged offending (excluding non-imprisonable traffic offences) and are expressed as a rate per 10,000 of the population in the age bracket. Thus they provide counts of the number of alleged offences, not the number of offenders (Ministry of Justice, 2010).

Overall child and youth apprehension rates have declined from the period 1995 to 2008 (Ministry of Justice, 2010). However, the youth apprehension rate for violence has been growing; the 2008 apprehension rate of 198 per 10,000 was 13% above the average rate for the period 1995–2008 (Ministry of Justice, 2010).

Overall, the apprehension rates for females aged 14–16 has remained relatively stable over the period 1995–2008 (Ministry of Justice, 2010).

Crawford and Kennedy (2008) examined trends in violent offending by youth over the period 1997 to 2007. They found that the rate of apprehensions for youth aged 14–16 for
grievous assaults had been increasing at a similar rate for both sexes. The rate of apprehensions for serious assaults had increased more strongly for females compared to males. For minor assaults there was a trend for decreasing apprehension rates for males but increasing rates for females. Overall the observed increase in apprehension rates is consistent with the international trends described above.

Generated from official data published on the Statistics New Zealand website, Figure 1 displays the apprehension rate for females aged 14-16 for acts intended to cause injury. As can be seen in the figure, there appears to be a gradual increase in apprehension rates for this violent offence category.

![Figure 1](image)

*Figure 1*. Apprehension rates for youth aged 14-16 for acts intended to cause injury from the years 1994 to 2013, per 10,000 of the population.

There are two hypotheses that may explain the observed increases in apprehension rates. The first is the Behaviour Change Hypothesis, which proposes that these statistics may be indicative of a real change in girls’ behaviour. On the other hand, the Policy Change Hypothesis suggests that these changes in rates are merely artefactual and result from changes in society’s tolerance of violence, public reporting of violence, increases in the number of police officers, focus of policing, adjustments in police recording, changes in charging practices, or enforcement policies that have heightened the visibility and reporting of girls’ criminal behaviour (Becroft, 2004; Crawford & Kennedy, 2008; Steffensmeier & Schwartz, 2009). Thus, a rise in apprehensions does not necessarily equate to a rise in offending.
The policy change hypothesis is supported by studies that examine unofficial sources of data (such as self-reports and victim accounts) which show little change in the prevalence of female violent and nonviolent offending (Chesney-Lind & Belknap, 2004; Chesney-Lind & Irwin, 2008; Steffensmeier & Schwartz, 2009; Zahn, Hawkins, Chiancone, & Whitworth, 2008).

Due to these factors, the number and nature of cases proven in Youth Court (rather than the number of apprehensions) may be a more reliable indicator of trends in female youth offending. These statistics are not as heavily influenced by the factors outlined above. In NZ, prosecution outcomes for youth include: (1) Section 282 discharges, where a youth is discharged from the Youth Court as if the charge had never been laid, (2) proved outcomes, (3) not proved outcomes and (4) convictions in the District or High Court. The rate of youth with proved outcomes in the Youth Court increased over the period 1992–2008, reaching a high of 65 per 10,000 in the 14–16 year age group (Ministry of Justice, 2010). The proportion of youth with proved outcomes for violent offences and property offences also increased over this period (Ministry of Justice, 2010).

Generated from official data published on the Statistics New Zealand website, Figure 2 displays the rate of female youth aged 14-16 who received either a proved outcome or conviction for acts intended to cause injury. As can be seen in the figure, there has been a small overall increase over the last two decades, however there is no clear pattern.

In regards to overall prosecutions, while males are accountable for the vast majority of charges laid for violent offences, the corresponding proportion of female youth has grown over the last decade (Ministry of Justice, 2012). In 2012, females accounted for 27% of violent prosecutions, which represents a gradual increase of 5% since 2003, suggesting a greater proportion of violent prosecutions are now attributable to young females (Ministry of Justice, 2012).

In summary, international and NZ apprehension rates indicate that female youth violence is increasing; however, given the policy change hypothesis outlined above, this might be an overestimation of the real change in females’ behaviour. In NZ, the available statistics for proved outcomes and convictions (which provide a more reliable measure of offending rates) indicate a small increase however do not suggest a significant change in the prevalence of violence by female youth. However, there is evidence to suggest that female youth violence may be growing more rapidly when compared to that of their male counterparts, given they are now accountable for a rising proportion of violent prosecutions.
Figure 2. Rates of youth court proved outcomes and convictions for 14-16 year old females for acts intended to cause injury from the years 1992 to 2013, per 10,000 of the population.

Ethnicity in the NZ Justice System

In NZ, Māori are over-represented at all stages of the criminal justice system. Those identifying as Māori are involved in 42% of all police apprehensions and comprise 50% of the prison population, although Māori comprise just 12.5% of the general population aged over 15 years (Department of Corrections, 2007). For Māori women, the statistics are even higher and they comprise 60% of the female prison population (Department of Corrections, 2007).

Young Māori are also over-represented in apprehension statistics. Māori children’s apprehension rate is over five times that of Pākehā and Pacific children, while Māori youth’s apprehension rate is over three times higher than that of Pākehā or Pacific youth (Statistics New Zealand, 2009). In the youth group, the recorded apprehension rate for violent offending by Māori is also much higher than for their non-Māori counterparts (Crawford & Kennedy, 2008). This study did not analyse trends which took into account both gender and ethnicity, however this discrepancy can be demonstrated by the latest available data on apprehension rates for the year ending June 2013. Over this time period, there were a total of 844 apprehensions for acts intended to cause injury for female youth aged 14-16. Of these, Māori youth accounted for 55% of the apprehensions and Caucasian youth accounted for 36%. The remaining 9% of
apprehensions were accounted for by other ethnic groups. These statistics demonstrate that Māori female youth are significantly over-represented (Statistics New Zealand, 2014).

Moreover, Māori are over-represented as victims of crime, a result which may be attributed to the fact that crime frequently occurs within families, social networks and immediate neighbourhoods (Department of Corrections, 2007). It must also be noted that over-representation is likely to be exacerbated by a justice system bias, in which Māori offenders are more likely to be convicted than non-Māori with an identical self-reported offending history and social background (Fergusson, 2003).

In summary, Māori females are highly over-represented in offending statistics; research focusing on Māori youth may be important to inform on-going service development and is essential in improving equity in the offending rates between Māori and non-Māori.

**Risk Factors and Correlates of Antisocial Behaviour amongst Female Youth**

As girls transition from childhood through adolescence to adulthood, they must navigate a wide range of challenges, with some girls more vulnerable to engaging in antisocial behaviours than others. This section will review the risk factors for “antisocial behaviour” which is defined as a pattern of norm-violating behaviours which may manifest in conduct problems, criminality and violence/aggression (Krueger et al., 2002).

Fishbein and colleagues (2009) suggest that although many of the same factors operate for both genders, males and females may vary in their rates of exposure to particular risk factors and furthermore, may be differentiated by their sensitivity and reactions to risk factors. For example, males and females may differ in their sensitivity to an identical process as a result of discrepancies in underlying biological functions, psychological traits and social interpretations of the experience (Fishbein et al., 2009). It follows that the resulting behavioural manifestations would differ between the sexes, despite exposure to the same type or intensity of a potential risk factor (Fishbein et al., 2009). Although many risk factors are gender invariant, some gender sensitive risk factors have emerged or have been found to interact in gender specific ways. Although it is beyond the scope of this review to comprehensively examine all the differences between males and females in their pathways to offending, where relevant this review will highlight factors that have emerged as gender sensitive.

The Social-Ecological viewpoint (Bronfenbrenner, 1977; 1979) has received support when investigating the complex phenomena of youth offending (e.g., Bronfenbrenner, 1979; Hoyt & Scherer, 1998; Huey, Henggeler, Brondino, & Pickrel, 2000; Shaw, Criss, Schonberg, & Beck,
Bronfenbrenner posited that an individual and an individual’s patterns of behaviour are understood to be part of and shaped by several environmental systems or larger systems of influence. From this viewpoint, offending behaviour occurs in the context of individual, family, peer group and community conditions. The identified risk factors for female antisocial behaviour will be discussed within this framework.

This overview does not attempt to provide an exhaustive review of all the causes and correlates of female offending, but aims to provide insight into some factors that have emerged as relatively common themes in the literature and also highlight if any racial/ethnic differences have been reported.

**Individual Characteristics**

**Biology, temperament, intelligence and onset of puberty.** Biological events that occur during early development can interact with environmental influences to increase the risk of female antisocial behaviour (Fishbein, 1992). These biological events can include excessive androgen production, exposure to synthetic androgens, Cushing’s disease, thyroid dysfunction, and congenital adrenal hyperplasia (Fishbein, 1992). Prenatal exposure to elevated testosterone levels has also been correlated with aggressive behaviour in both males and females (Ellis, 1987).

Javdani et al. (2011) conducted a systematic review on the risk factors for female antisocial behaviour. Their extensive review integrated research from across disciplines (e.g., sociology, criminology, anthropology, women’s studies), and from both quantitative and qualitative methodologies. In regards to person-level characteristics, the authors concluded that additive genetic effects, the Monoamine Oxidase A (MAO-A) genotype, and aspects of infant and early childhood temperament, such as low inhibitory control and fearlessness, were correlated with antisocial behaviour.

Longitudinal research has indicated that lack of control, specifically emotional lability, restlessness, negativism and short attention span, are predictive of antisocial behaviours (Caspi, Henry, McGee, Moffitt, & Silva, 1995). Other research has demonstrated a link between difficult temperament at age three and aggressive and antisocial behaviours at age 12 (Guerin, Gottfried, & Thomas, 1997). Miller and Lynam (2001) conducted a meta-analysis of 59 cross-sectional studies investigating the personality predictors of antisocial behaviour in youth and adults. They reported that psychoticism, disagreeableness, negative emotionality, low conscientiousness and novelty seeking were the strongest predictors of antisocial behaviour in females. It has also been found that more disruptive girls are less empathic than their non-
delinquent counterparts and this deficit is greater among females than among males (Broidy, Cauffman, Espelage, Mazerolle, & Piquero, 2003).

Lower general intelligence (which involves basic, global, cognitive functions) (Fishbein, Miller, Winn, & Dakof, 2009) has proven to be predictive of antisocial behaviour across both genders (Fergusson & Horwood, 1995; Fishbein et al., 2009; Maguin & Loeber, 1996). Several studies have found low IQ to be related to greater delinquency and recidivism in boys and girls (Fishbein et al., 2009). It has also been found that adolescents with higher levels of conduct problems have lower cognitive ability (Boden, Fergusson, & Horwood, 2010). Similarly, weak language skills have been correlated with female youth offenders. Amongst incarcerated female adolescents in the USA, rates of 14% to 22% have evidenced weak language skills (Sanger, Creswell, Dworak, & Schultz, 2000; Sanger, Hux, & Belau, 1997; Sanger, Moore-Brown, Magnuson, & Svoboda, 2001).

A body of evidence outlines that the timing of puberty is important for understanding female antisocial behaviour. Numerous studies, including longitudinal designs that employ both high-risk and normative samples, have found that females with early onset puberty are more likely than their average-onset peers to engage in antisocial behaviours (Flannery, Rowe, & Gulley, 1993; Ge, Brody, Conger, & Simons, 2006; Haynie, 2003; Kaltiala-Heino, 2003; Lynne, Graber, Nichols, Brooks-Gunn, & Botvin, 2007; Najman et al., 2009; Negriff, Fung, & Trickett, 2008; Negriff & Trickett, 2010; Susman et al., 2010), although, the Christchurch Health and Development Study (Boden, Fergusson, & Horwood, 2011) has produced conflicting results. The Christchurch Health and Development Study (CHDS) tracked the life progress of a cohort of 1,265 children born in the Christchurch region in 1977 from infancy to childhood, adolescence and adulthood. This study found little evidence to suggest that early pubertal timing was related to criminal behaviour in a sample of almost 500 females. It is proposed that early puberty can lead a young female to gravitate towards contexts that promote antisocial behaviour (Javdani et al., 2011). For instance, a female’s early maturation may create increased attention from males and early sexual relationships, this increased tendency to associate with older males may impact on delinquency, particularly if the older male is involved in delinquent activities (Lenssen, Doreleijers, Van Dijk, & Hartman, 2000; Stattin & Magnusson, 1990).

**Trauma and stress.** Trauma occurs on multiple levels and includes (but is not limited to) sexual, physical and emotional abuse, neglect, parental alcoholism, witnessing family violence, and discrimination/stigmatisation due to race, gender, and poverty (Bloom, Owen, & Covington, 2003).
In regards to sexual abuse, reported rates in antisocial female populations have ranged from 36% through to 60% (Cauffman, Feldman, Watherman, & Steiner, 1998; Chamberlain & Moore, 2002; Dembo, Schmeidler, & Childs, 2007; Goldstein et al., 2003; Walrath et al., 2003). These rates are elevated compared to the normal population of American adolescent females, which has rates of around 12% reported sexual abuse (Schoen et al., 1997). Evidence reviewed across a multitude of largely USA studies suggests that sexual abuse is a risk factor for females’ engagement in antisocial behaviours (Javdani et al., 2011), across both Caucasian and minority groups (Katz, 2000). This link has been demonstrated prospectively across longitudinal studies (Cernkovich, Lanctôt, & Giordano, 2008; Fergusson, Boden, & Horwood, 2008; Fergusson, Horwood, & Lyskey, 1996; Hahm, Lee, Ozonoff, & Wert, 2010; Herrera & McCloskey, 2003; Siegel & Williams, 2003) and also in many cross-sectional studies (Arata, Langhinrichsen-Rohling, Bowers, & O’Brien, 2007; Gault-Sherman, Silver, & Sigfúsdóttir, 2009; Harlow, 1999; Hubbard & Pratt, 2002; Leeb, Barker, & Strine, 2007; MacMillan et al., 2001; Mason, Zimmerman, & Evans, 1998; McCabe, Lansing, Garland, & Hough, 2002; Phan & Kingree, 2001; Verona & Sachs-Ericsson, 2005; Wright, Friedrich, Cinq-Mars, Cyr, & McDuff, 2004). These studies have employed a range of samples and methods to measure antisocial behaviour and sexual abuse. Moreover, Javdani et al. (2011) propose that sexual abuse is a female-specific risk factor for antisocial behaviour (see Javdani et al., 2011 for a comprehensive review).

Reported prevalence rates of physical abuse amongst antisocial female youth populations have ranged from 40% to 64% (American Correctional Association, 1986; Chamberlain & Moore, 2002; Dembo et al., 2007; Walrath et al., 2003). These rates are elevated compared to the normal population of American adolescent females, which has physical abuse rates of around 17% (Schoen et al., 1997). In a NZ longitudinal study, Fergusson and Lyskey (1997) found that those reporting physical abuse during childhood exhibited higher rates of youth offending compared to their non-physically abused counterparts. Much of this elevated risk was accounted for by social and contextual factors that were commonly associated with backgrounds of physical abuse/maltreatment; however, even after adjustment for confounding factors, physically abused youth were at elevated risk of violent offending.

Dixon, Howie and Starling (2004) reported that female offenders in their sample reported more physical and sexual abuse compared to their non-offending counterparts. They reported that many of the female offenders in this study had been raised in foster care or institutionalised as young people. From the subsample of males and females that had been raised in these environments, 87% of females and 44% of males reported abuse, suggesting that within such settings, females may experience higher rates of victimisation than males.
In a study of 96 young female offenders, Cauffman et al. (1998) found approximately 75% reported being either badly hurt, in danger of being badly hurt or being a witness to a severe injury or death. In addition, 60% reported being raped or in danger of being raped. Goldstein (2003) reported 44% of female offenders had been raped at least once and 52% had witnessed someone being killed.

In regards to ethnic discrepancies, researchers have found that African Americans and Hispanic female youth offenders were much more likely to have a history of violent victimisation compared to their Caucasian counterparts (Molnar, 2005). However, the Gender and Aggression Project (Chauhan, Reppucci & Burnette, 2010) found that African American and Caucasian girls in the criminal justice system experienced similarly high rates of violence exposure by parents (65% overall) and peers (75% overall). Almost all girls (98%) had witnessed violence across a home, school or neighbourhood setting, with no racial differences reported in these rates. Interestingly these authors found that after release, previously witnessing violence was associated with nonviolent delinquent behaviours and previously experiencing violence perpetrated by parents was related to violent behaviours. When race was taken into account, experiencing violence perpetrated by parents was linked to violent behaviour by Caucasian girls but not for African American girls. Alternatively, witnessing violence was linked with the violent and delinquent behaviour of African American girls but not that of their Caucasian counterparts. The authors conclude that despite these groups experiencing similar levels of these risk factors, the experience of violence played a distinct role in terms of their ability to predict future offending.

**Early sexual involvement and risky sexual behaviour.** There is evidence to suggest that female youth offenders often engage in risky sexual behaviours. This includes early onset of sexual experimentation and frequent sexual contacts with more than one partner, who are often much older (Lenssen et al., 2000). Gillikin (2009) found that increasing severity of substance abuse/use was linked to risky sexual behaviour, and that both substance use and risky sexual behaviour were strong predictors of recidivism for adolescents.

**Pregnancy.** Studies have demonstrated that, related to their risky sexual behaviours, conduct disordered girls have a three to five fold higher risk of an early pregnancy compared to their female counterparts without a history of antisocial behaviour (Bardone, Moffitt, Caspi, Dickson, & Silva, 1996; Kovacs, Krol, & Voti, 1994; Woodward & Fergusson, 1999). Pregnancy is a common experience amongst female youth offenders, with 26% to 32% reporting a previous or current pregnancy (Acoca, 1999; Lederman, Dakof, Larrea, & Li, 2004; Robertson, Xu, & Stripling, 2010). Robertson et al. (2010) found that over half of female youth offenders’
pregnancies end in miscarriage, abortion or adoption, all events which can be significant stressors. Extending the effects of family fragmentation into the next generation, Acoca and Dedel (1998) found that 83% of young female offender mothers reported that they had been separated from their babies at a critical developmental stage, within the first three months since birth.

**Running away.** This population are also at high risk of running away from their caregivers. For example, Walrath et al. (2003) reported that 69% have had a runaway attempt. Researchers have established a link between abuse and running away (e.g., Rhodes & Fischer, 1993), and it has been proposed that running away from home due to abuse experiences may precipitate antisocial behaviours, as illegal behaviours are employed to survive on the streets (Chesney-Lind & Sheldon, 2004).

**Family Characteristics**

It has been well established that family dynamics can influence the development of antisocial behaviour (Javdani et al., 2011). It must be noted that there is some overlap between some of the individual risk factors reported above and family risk factors. For example, trauma or abuse may often occur within the context of the family. Previously discussed issues such as physical abuse and sexual abuse will not be repeated here.

**Family fragmentation and family structure.** An extensive body of literature indicates that parental divorce is a risk factor for psychosocial maladjustment and academic problems when compared to children and adolescents with married parents (Kelly, 2012). The results of two meta-analyses (of 93 and 97 studies) conducted by Amato (2001) revealed that the largest effects were found for externalising problems (e.g., conduct disorders, antisocial behaviours, delinquency). Adolescents living in families with two biological parents have lower rates of delinquent behaviours (Amato & Keith, 1991). However, it is typically found that effects due to family structure are not large and often differences may be attributed to other factors that are related to exposure to single parenthood, such as family background, individual characteristics, and differences in family dynamics or processes (e.g., parental supervision, parental conflict) (Broidy, 1995; Fergusson, Boden, & Horwood, 2007; Kelly & Emery, 2003; Kruttschnitt & Giordano, 2009).

**Parenting and delinquency.** Across study designs (meta-analyses, longitudinal and cross-sectional), parenting style has been found to be predictive of antisocial behaviour amongst females (Hoeve et al., 2009; Javdani et al., 2011). Findings suggest that authoritarian and, to a
lesser extent, permissive parenting styles are risk factors for the development of antisocial behaviour, whereas authoritative parenting serves as a protective factor (Javdani et al., 2011).

Results from a meta-analysis of 161 published and unpublished manuscripts (Hoeve et al., 2009) indicated that psychological control (which refers to parenting that prolongs a child’s dependence, attempts to change a child’s feelings, uses guilt as a tool of control, or uses ignoring as a means of punishment) demonstrated the strongest link to delinquency. When subcategories within parenting dimensions were analysed, strong mean effect sizes were found for negative aspects of support (such as neglect, rejection and hostility or various combinations of these). Parental monitoring (which included active monitoring by parents, parental knowledge of the whereabouts of a child and child disclosure) showed a strong negative association with delinquency. These findings are in line with findings from a previous meta-analysis (Loeber & Stouthamer-Loeber, 1986) which reported that parental rejection and poor supervision were among the strongest predictors of youth offending.

Family members’ criminality and drug use. Family criminality and drug use is ubiquitous in the lives of female youth offenders (Bergsmann, 1989; Chamberlain & Moore, 2002; Fejes-Mendoza, Miller, & Eppler, 1995; Gaarder & Belknap, 2002; Giordano & Mohler-Rockwell, 2001). Acoca (1999) interviewed over 200 females in American juvenile halls and found that 54% of female youth offenders reported maternal arrest or incarceration and 46% reported paternal arrest or incarceration. Lower rates for paternal criminality may be explained by many girls reporting little or no contact with fathers (Acoca, 1999). Narrative accounts from female youth offenders followed into adulthood documented extensive criminal activity, violence and drug use by both parents (Giordano & Mohler-Rockwell, 2001). Frequently, these narratives emphasised graphic depictions of the mother’s criminal behaviour and drug use, as well as other female relatives’ involvement.

Parental drug use is common in the backgrounds of female youth offenders. Funk (1999) reported that over one third of male and female adolescent offenders had parents that abused alcohol or drugs. Keller, Catalano, Haggerty and Fleming (2002) investigated whether multiple parent-figure transitions predicted the likelihood of children of substance abusing parents engaging in drug use and delinquency. The authors found that the likelihood of delinquent behaviour simultaneously increased with the number of parenting disruptions. However, in regards to drug use, only adolescent females had a higher probability of drug use as the number of parental disruptions increased.

Family instability. The vast majority of female youth offenders have lacked a stable home environment (Acoca, 1999). An upbringing characterised by frequent moves between
relatives or placements in foster or group homes is widespread amongst female youth offenders (Acoca, 1999; Fejes-Mendoza et al., 1995) and rates of up to 11% report experiencing or witnessing the death of a parent or a sibling (Acoca, 1999).

**Family violence.** In an overview of European studies, Wong et al. (2010) found that harsh discipline and physical abuse by parents is positively associated with female delinquency and Katz (2000) reported that physical abuse by a parent was the strongest predictor of delinquency amongst minority females. In NZ, Swift (2011) conducted a study on the use of violent and antisocial behaviour by female youth. This study employed a mixed methodology approach: they first administered questionnaires to 3,400 year 9 and 10 boys and girls (1,704 girls), followed by running 40 focus groups with girls aged 12–18 to shed light on young women from “mainstream” settings. They also shared the perspectives of approximately 100 girls who had a history of engaging in violent behaviour and became involved in the study through their association with authorities. This study found that many girls who used violent and antisocial behaviour had been exposed to family violence, and described being raised in an environment where they had witnessed and experienced violence being used as a means to obtain desired results.

Becker and McCloskey (2002) investigated if different forms of family violence influenced delinquency through attention and conduct problems. For females, paternal abuse was positively related to both conduct problems and delinquency (both violent and non-violent), whereas for males, marital violence and paternal abuse were not significantly related to delinquency. In the CHDS, Fergusson and Horwood (1998) found that young people who reported exposure to high levels of inter-parental violence had elevated rates of adjustment problems (mental health problems, substance abuse and offending behaviours) at age 18. The authors found that much of this elevated risk had arisen from other social and contextual factors, such as social disadvantage, family dysfunction and child abuse. Interestingly, even after controlling for these confounding factors, exposure to father-initiated violence was linked to higher risk of anxiety, conduct disorder and property crime, whereas exposure to mother-initiated violence was linked to a higher risk of alcohol problems. This study suggests that inter-parental violence occurs within a constellation of other social dynamics such as social disadvantage, family dysfunction, and child abuse (Fergusson & Horwood, 1998).

**Peer Characteristics**
A number of peer characteristics have been associated with increased risk of offending. These risk factors are reviewed below.
**Deviant peer associations.** Numerous studies have identified that affiliation with deviant peers is an important predictor for engagement in antisocial behaviours (Fergusson & Horwood, 1996; Haynie, 2001), and in a meta-analysis of factors associated with female delinquency, peer delinquency emerged as one of the strongest predictors (Hubbard & Pratt, 2002). Longitudinal and cross-sectional studies that employed diverse samples (high risk and community) have reported that deviant peer affiliation increases antisocial behaviour amongst females (Ardelt & Day, 2002; Erickson, Crosnoe, & Dornbusch, 2000; Heinze, Toro, & Urberg, 2004; Jennings, Maldonado-Molina, & Komro, 2010; Liu & Kaplan, 1999; Mears, Ploeger, & Warr, 1998; Werner & Silbereisen, 2003). For example, researchers from the CHDS investigated the influence of deviant peer associations on criminal behaviour and substance use in adolescence and young adulthood (Fergusson, Swain-Campbell, & Horwood, 2002). This study conducted annual assessments of deviant peer affiliations from the ages of 14 to 21 years, as well as measures of violent crime, property crime, nicotine dependence, cannabis abuse and alcohol abuse. They found that deviant peer affiliations were significantly associated with all of these outcomes.

Although youth often report a mix of delinquent and non-delinquent friends, Haynie (2002) found that youth involved in more serious levels of delinquency reported that almost all of their friends were delinquent. Similarly, Boden, Fergusson and Horwood (2010) found that adolescents with higher levels of conduct problems had stronger affiliations with delinquent and substance-abusing peers.

In regards to ethnic discrepancies, an American study by Katz (2000) reported that the influence of delinquent peers was the strongest predictor of delinquency for Caucasian girls, but not for other ethnic groups. This finding suggests that delinquent peers may have differing levels of influence across different ethnic/racial groups.

**Male friends and male partners.** Having friends of the opposite sex is more closely associated with delinquency in females than in males (Smith & McAra, 2004). Mixed gender peer groups, attendance at mixed gender schools and identification of a male as a best friend have all been associated with increased female delinquency (Caspi, Lynam, Moffitt, & Silva, 1993; Johnson, 2002; Warr, 1996). A large-scale longitudinal study with over 14,000 adolescents (Haynie, Steffensmeier, & Bell, 2007) provides compelling evidence for this association. They found that association with opposite sex peers increased serious violence in females but decreased serious violence amongst males.

Having a romantic relationship increases the likelihood of delinquent behaviour amongst both genders, however a gendered effect for minor delinquency has been found which suggests
that girls’ partners have a stronger influence in relation to minor delinquency than do boys’ partners (Haynie, Giordano, Manning, & Longmore, 2005; Smith & McAra, 2004). The influence of these interpersonal relationships can sometimes outweigh the influence of parents. For example, Meeus, Branje and Overbeek (2004) reported that parental influence on a youth’s offending is strongest when the young person has no romantic partner and parental support fails to affect delinquency for youth who have a romantic partner.

These findings highlight the importance of the interpersonal context for females and illustrates that an adolescent’s social connections may provide a powerful constellation of influences, including support for antisocial behaviour (reflected in delinquent definitions and modelling of delinquent behaviour), amplifying risk-taking in specific situations and fostering and reinforcing an adolescent’s identity as a delinquent (Matsueda, 1992).

School Characteristics
A substantial body of literature has investigated the relationship between school achievement and varying aspects of school attachment, commitment and school climate on antisocial behaviour (Gottfredson, 1981; Maguin & Loeber, 1996).

Academic performance. A meta-analysis of 42 cross-sectional studies and 26 longitudinal studies (Maguin & Loeber, 1996) concluded that lower academic performance is associated with greater delinquency. Although there is some evidence that this relationship may be partially explained by other factors such as intelligence and attention problems (Maguin & Loeber, 1996).

Other school characteristics. Low attachment to school (whether the youth liked to go to school), low commitment to school (whether they were willing to put in an effort), frequent absenteeism, frequent school changes, school dropout, expulsion and low quality relationships with teachers have all been associated with female delinquency (Chesney-Lind & Shelden, 1998; National Center for Education Statistics, 2000; Rumberger & Larson, 1998; Somers & Gizzi, 2001; Wong et al., 2010). In addition, early occurrences of disruptive behaviour in school, limited involvement in extracurricular activities and attendance at mixed sex schools have been associated with female delinquency (Eccles & Barber, 1999; Ladd & Burgess, 2001).

In a qualitative NZ study, Swift (2011) concluded that frequent school moves limit a girl’s ability to form an attachment with the school and the resulting lack of this bond leads to a diminished interest and motivation to stay involved. Swift also argued that frequent school relocations can repeatedly sever a girl’s links with her peers and community, which results in
poor experiences to model healthy relationships, and may also impact on a girl’s ability to develop trust and respect for another person.

**Perpetrating bullying at school.** Ttofi, Farrington, Lösel and Loeber (2011) conducted a meta-analysis of longitudinal studies to investigate if bullying perpetration at school predicted offending later in life. They reported that the probability of engaging in offending behaviours up to 11 years later was higher for school bullies than for students who did not bully others. Bullying was a significant risk factor even when controlling for other major childhood risk factors.

**Community/Neighbourhood Characteristics**
The effect of antisocial peers may be further compounded in disadvantaged neighbourhoods where violence, drug use and drug sales may be more common (Zahn, 2007). Aspects of community characteristics and their relation to propensity for offending behaviours are discussed below.

**Disadvantaged neighbourhoods.** A body of empirical evidence indicates that young females who live in economically disadvantaged or violent neighbourhoods are more likely to engage in violent offending or other criminal activities than female youth who live in more advantaged communities (Abram et al., 2008; Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Heimer & De Coster, 1999; Ingoldsby & Shaw, 2002; Jacob, 2006; Molnar, Browne, Cerda, & Buka, 2005; Steffensmeier & Haynie, 2000). In a meta-analysis of studies evaluating risk factors for female delinquency, Hubbard and Pratt (2002) identified socioeconomic status as a predictor of delinquency. Like their male counterparts, females living in disadvantaged neighbourhoods are exposed to greater risks including exposure to violence and deviant peers, when compared to females living in more advantaged neighbourhoods (Ingoldsby & Shaw, 2002). It has also been found that living in a disadvantaged neighbourhood may also amplify the effects of peers and other individual factors like the early onset of puberty (Obeidallah, Brennan, Brooks-Gunn, & Earls, 2004).

For both males and females, the impact of neighbourhood factors is small once individual level risk factors, such as family structure and age, are taken into account (Kroneman, Loeber, & Hipwell, 2004; Leventhall & Brooks-Gunn, 2000). For example, in the CHDS, Fergusson, Swain-Campbell and Horwood (2004) investigated the associations between childhood measures of socioeconomic deprivation and later involvement in crime. They found that childhood socioeconomic disadvantage was related to increases in offending. However, after controlling for a range of individual, family, school and peer factors the association became non-significant.
This suggests that the higher rates of offending behaviours found amongst adolescents from socioeconomically disadvantaged families is indicative of a process whereby adverse individual, family, school and peer factors merge to increase an individual’s propensity for crime (Fergusson et al., 2004).

**Urban residence.** Urban neighbourhoods with concentrated poverty have higher rates of youth violence, arrests, violent victimisation and exposure to violence (Farrell & Bruce, 1997; Krivo & Peterson, 1996; Lauritsen & White, 2001; Margolin & Gordis, 2000; McNulty & Bellair, 2003a; McNulty & Bellair, 2003b; Messner, Raffalovich, & McMillan, 2001; Molnar et al., 2005; Schuck & Widom, 2005; Steffensmeier & Haynie, 2000). Archwamety and Katsiyannis (1998) found that female youth offenders from urban areas had significantly higher recidivism rates than female youth offenders from rural areas. Location of residence (urban or rural) was found to be the second best predictor of recidivism in this study. The authors suggested that female youth offenders may be more vulnerable than males to the conditions of urban settings.

**Race/ethnicity.** Minority groups are frequently over-represented in samples of adolescent female offenders (Chauhan et al., 2010; Kakar, Friedemann, & Peck, 2002; Piquero & Buka, 2002). This is likely because many youths from minority ethnic groups are heavily exposed to the effects of concentrated disadvantage and social disorder (Chauhan et al., 2010). This differentially exposes youth in these communities to a number of risk factors for violence perpetration and criminal activity (Massey & Denton, 1993; Sampson & Wilson, 1995).

In the NZ context, life circumstances that are frequently linked to offending are, for a variety of reasons, more likely to affect Māori families (Department of Corrections, 2007). For example, a greater proportion of Māori than non-Māori face socioeconomic disadvantage and are exposed to numerous factors of developmental, family, education and other social domains which have been associated directly or indirectly with offending behaviours (Department of Corrections, 2007).

Neighbourhood disadvantage has been found to explain a significant proportion of the racial disparity in antisocial behaviour (Sampson, Jeffrey, Morenoff, & Raudenbush, 2005). Other researchers have found that income inequality predicts antisocial behaviour (Daly, 1998; Harer & Steffensmeier, 1992; Hipp, 2007), which also may explain the higher rates of antisocial behaviour among minority ethnic groups. Similarly, in NZ, the CHDS researchers concluded that ethnic differences in violent behaviour were not significant after controlling for family and developmental factors (Fergusson, 2003).
In NZ, Marie, Fergusson and Boden (2009) used data from the CHDS to explore the role of Māori cultural identity in predicting offending. Participants were grouped into three categories, (1) sole Māori identification, (2) Māori/other, and (3) non-Māori. Significant associations were found between the first two groups and both official and self-reported offending rates. After controlling for a range of confounding factors such as socioeconomic status, personal adjustment and family functioning, only the Māori/other group remained significantly associated with offending. The findings support the view that variations in cultural identity are associated with offending outcomes, namely that Māori identity mitigates the effects of childhood adversity, whereas having a mixed cultural identity does not. However, given that non-Māori identification and sole Māori identification were associated with similar risks of offending, it has also been suggested that it may be the security of cultural identity that is important, rather than the notion of cultural identification (Phinney, Lochner, & Murphy, 1990).

In light of these findings, it appears that ethnicity itself is not a risk factor for delinquent behaviour, however, minority ethnic groups may be more vulnerable to offending behaviours due to their higher exposure to the effects of socioeconomic disadvantage (which have been linked with offending). There is also some evidence to suggest that the association between ethnicity and crime in NZ is mediated via cultural identity.

Unemployment. In the CHDS, Fergusson, Lynsky and Horwood (1997) investigated the association between duration of unemployment and youth offending. They found that duration of unemployment was significantly associated with violent and property offending. Unemployment was also related to a variety of adverse individual, school, family and social factors; however, even after adjustment for these factors, the young people exposed to unemployment after leaving school were significantly more likely to engage in offending.

Summary of Risk Factors and Correlates of Antisocial Behaviour
In summary, there are numerous factors that may impact an individual female’s propensity to engage in antisocial behaviours and, as recognised by Bronfenbrenner (1977; 1979), these may span across several systems of influence.

Individual influences such as the effects of biological factors, personality and temperament characteristics (psychoticism, disagreeableness, negative emotionality, low conscientiousness and novelty seeking), low general intelligence, early onset of puberty and exposure to trauma and stress have been implicated in the development of antisocial behaviour. Influences from the family include factors such as non-traditional family structure, family criminality/drug use, and family processes such as instability, poor parenting and violence. Outside of the family, a
female youth may be adversely influenced by a deviant peer group. Involvement with male peers and male romantic partners are also identified as risk factors. In school, factors such as low attachment to school and teachers, low commitment to school, absenteeism, frequent school changes, school exclusions and school dropout have been associated with female antisocial behaviour. Finally, aspects of the community that may influence a young female to engage in antisocial behaviour include disadvantaged neighbourhoods, living in an urban area, identification with a minority ethnic group and unemployment following school leaving.

Some factors have been recognised as particularly salient for females (compared to males), and these include experiences of sexual abuse, early pubertal development, and having opposite sex peers and romantic partners.

Again, it is emphasised that no single factor should be considered in isolation. The pathway to offending should be considered unique for each individual youth, and the individual sensitivity to differing factors, at different doses, and at different developmental stages may vary.

The Psychological Wellbeing of Female Youth Offenders

This section will review the prevalence of mental health problems and substance abuse problems amongst female adolescents who engage in antisocial behaviours. Although these problems may also be considered as risk factors, it remains unclear whether they precede, coincide with or follow antisocial behaviours as most studies involve detained and incarcerated youth and few examine mental health problems at different points in the youth justice system (e.g., at intake or diversion; Fishbein et al., 2009).

Rates of reported mental health problems have varied across studies, likely due to the diverse range of criteria, assessment techniques and severity of populations. Despite these inconsistencies, a substantial body of literature indicates that female youth offenders have elevated rates of mental health problems compared to their male counterparts (Cauffman, Lexcen, Goldweber, Shulman, & Grisso, 2007; Robertson, Dill, Husain, & Undesser, 2004; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Timmons-Mitchell et al., 1997), which are, in turn, linked with proneness to antisocial behaviours (Fishbein et al., 2009).

Several well designed studies have reported that over two thirds of detained female youth offenders met diagnostic criteria for at least one psychiatric disorder (Lederman et al., 2004; McCabe et al., 2002; Robertson et al., 2004; Teplin et al., 2002; Timmons-Mitchell et al., 1997) and emerging evidence points to the high prevalence of comorbidity (Abram, Teplin, McClelland, & Dulcan, 2003; Dixon et al., 2004; Karnik et al., 2009; Lederman et al., 2004;
Lenssen et al., 2000). For example, Abram et al. (2003) explored comorbidity in a sample of 1,829 detained youths and reported that significantly more females (57%) than males (45%) met criteria for at least two of the following disorders: dysthymia, major depressive disorder, psychosis, manic episode, panic disorder, separation anxiety, generalised anxiety disorder, overanxious disorder, obsessive-compulsive disorder, conduct disorder, oppositional defiant disorder, attention-deficit/hyperactivity disorder, alcohol use disorder, marijuana use disorder, and other substance use disorder. In contrast to the presence of a single disorder, comorbidity has been associated with poor treatment response and severe impairment in life activities and functioning (Bijl & Ravelli, 2000).

An overview of the prevalence rates for psychological problems commonly experienced by females that engage in antisocial behaviours will follow. Psychological problems are commonly divided into two categories, (1) externalising, which are manifested in “outward” or external behaviour, and (2) internalising, which are manifested in “inward” thoughts and feelings (Merrell & Walker, 2004).

Both types of disorder are found to be associated with antisocial behaviours by early to mid-adolescence (Kellam, Brown, & Fleming, 1983; Wiesner & Kim, 2006); however, externalising behaviours are more strongly related (Betz, 1995; Farrington, 1989; Moffitt, 1993).

Externalising Disorders

Conduct Disorder (CD). Given that the definition of CD includes antisocial behaviours, it is not unexpected that a large proportion of female youth offenders fit diagnostic criteria for CD. Reported rates of CD amongst this population vary widely from 17% through to 96% (Dixon et al., 2004; Karnik et al., 2009; Lederman et al., 2004; Robertson et al., 2004; Russell & Marston, 2009-2010; Teplin et al., 2002; Timmons-Mitchell et al., 1997; Ulzen & Hamilton, 1998). A meta-analysis conducted by Fazel, Doll and Långström (2008) provided an average estimate of 52.8%. These estimated rates are elevated compared with the prevalence rates in the general population of female youth, which range from 0.8% to 9.2% (Loeber, Burke, Lahey, Winters, & Zera, 2000). Researchers have established the prevalence of comorbidity with ADHD in as many as 30% to 50% of cases (Biederman, Newcorn, & Sprich, 1991).

Attention Deficit Hyperactivity Disorder (ADHD). Amongst incarcerated female adolescents, reported prevalence rates of ADHD vary between 13% and 68% (Dixon et al., 2004; Karnik et al., 2009; Lederman et al., 2004; Robertson et al., 2004; Russell & Marston, 2009-2010; Teplin et al., 2002; Timmons-Mitchell et al., 1997; Ulzen & Hamilton, 1998), with a meta-analysis reporting an average rate of 18.5% (Fazel et al., 2008). This rate is elevated when
compared to the general population of adolescent females, where estimated rates range from 1.1% to 6.7% (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003) but is not significantly different to the rates found for male youth offenders (McCabe et al., 2002; Teplin et al., 2002). Overall, the study of ADHD has been male dominated and little is known about whether ADHD is a precursor to female antisocial behaviour (Fishbein et al., 2009). One longitudinal study (Messer, Maughan, Quinton, & Taylor, 2004) followed a sample of 183 females from young adulthood through to ages 34 - 40 and reported that hyperactivity (as determined by retrospective reports) was significantly associated with offending in adulthood, as was adolescent CD.

**Substance use disorders.** Amongst the general population of young people, researchers have identified a trend of increasing substance use over recent decades (Wright & Pearl, 1995, 2000) and it is acknowledged that experimentation with substances is a widespread and serious problem that characterises the adolescent years. However, an even sharper increase in substance use has been found in youth justice populations (Lennings, Copeland, & Howard, 2003). Reported rates of substance use disorders among female youth offenders range from 28% to 72% (Lederman et al., 2004; McClelland, Elkington, Teplin, & Abram, 2004; Obsuth, Watson, & Moretti, 2009-2010; Robertson et al., 2004; Teplin et al., 2002). Using data from the Gender and Aggression Project (Vancouver site), Obsuth et al. (2009–2010) found that of all youth, 70% were found to have at least one substance dependence disorder at the time of assessment and 74% was the lifetime prevalence rate. The authors reported that females endorsed the first significantly impairing symptom of alcohol dependence, marijuana dependence and street drug dependence at the average ages of 13.3 years, 12.6 and 13.2 respectively. These average ages were younger than for their male counterparts (13.8, 13 and 14.1 for alcohol, marijuana and street drugs respectively). Adolescent females may also be more likely than their male counterparts to become dependent on illicit drugs (Kandel, Chen, Warner, Kessler, & Grant, 1997). This therefore highlights the importance of this factor as it places them at greater risk of developing multiple substance use disorders (MSUDs). MSUDs are common (Domalanta, Risser, Roberts, & Risser, 2003; Obsuth et al., 2009-2010), with around 22% of female youth offenders having two or more substance use disorders (McClelland et al., 2004). MSUDs pose a significant challenge to treatment as those with MSUDs have complex treatment needs and are often more recalcitrant to treatment. This is illustrated by their higher treatment dropout and relapse rates (Almog, Anglin, & Fisher, 1993; Cohen, 1981; Rounsaville, Dolinsky, Babor, & Meyer, 1987; Rowan-Szal, Chatham, & Simpson, 2000). Use of multiple substances also presents a number of poor health risks such as overdose, aggression, violent behaviour, suicidality and other psychopathology (Cohen, 1981; Hubbard, 1990; Rounsaville et al., 1987).
Internalising Disorders

Major Depressive Disorder (MDD). MDD is common in the general population of adolescent females with reported rates ranging from 10% to 27% by the end of the adolescence years (Kessler et al., 2005; Richardson et al., 2003; Schoen et al., 1997). MDD is considerably more common amongst adolescent female offenders with reported rates ranging from 12% to 88% (Dixon et al., 2004; Domalanta et al., 2003; Goldstein et al., 2003; Russell & Marston, 2009-2010; Teplin et al., 2002; Timmons-Mitchell et al., 1997). A meta-analysis reported an average rate of 29.2% (Fazel et al., 2008). This rate is significantly higher than adult female offenders, where a 12% average rate has been reported (Fazel & Danesh, 2002) and is three times more prevalent than rates found amongst male adolescent offenders (Fazel et al., 2008).

Anxiety disorders. Estimates of anxiety disorders in the general population of children and adolescents range from 10% to 15% (Costello et al., 2003). Anxiety disorders are more prevalent amongst female youth offenders than male youth offenders, with reported rates ranging from 12% to 59% (Domalanta et al., 2003; Goldstein et al., 2003; Karnik et al., 2009; Lederman et al., 2004; Russell & Marston, 2009-2010; Teplin et al., 2002). Onset of symptoms often precedes the experience of incarceration, suggesting that anxiety disorders may contribute to problem behaviours rather than result from incarceration (Russell & Marston, 2009-2010).

Post-Traumatic Stress Disorder (PTSD). The prevalence of PTSD in the general population of female adolescents is approximately 10% (Giaconia et al., 1995; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Lifetime prevalence of PTSD in female youth offenders is estimated to be around 65% (Cauffman et al., 1998).

Suicidal or self-destructive behaviours. Suicidality comprises thoughts and behaviours which involve deliberate attempts to harm oneself or to end one’s life. Rates of suicidal ideation and suicide attempts among the female adolescent offending population are strikingly high, with researchers reporting rates ranging from 20% to 50% (Corneau & Lanctôt, 2004; Goldstein et al., 2003; Research Advisory Services, 1988; Walrath et al., 2003). For example, in a Canadian study (Farand, Chagnon, Renaud, & Rivard, 2004), youth involved with the child welfare and youth justice systems accounted for at least one third of suicides in their age group. Their risk of suicide was five times that of the general population of adolescents, and females involved in the juvenile justice system had the highest relative risk of suicide. In a UK study, Fazel and Benning (2009) reported suicide rates amongst incarcerated females were 20 times more common than in the general population. When age was taken into account, they found no suicides for females under 18; however, 18–20 year olds were 70 times more likely to die by suicide. This finding
underscores the importance of assessment and treatment of female offenders in their adolescent years. Russell (2010) explained that the high rate of suicide amongst young female offenders may be due to the high prevalence of suicidality risk factors that are salient amongst this group, which include delinquency (Thompson, Ho, & Kingree, 2007), depression and anxiety (Abram et al., 2008; Penn, Esposito, Schaeffer, Fritz, & Spirito, 2003), victimisation experiences (Dixon et al., 2004; Domalanta et al., 2003), post-traumatic stress disorder (Plattner et al., 2007) and impulsivity (Rohde, Seeley, & Mace, 1997).

Racial/Ethnic Discrepancies in Mental Health Disorders

Despite a recent increase in attention to the mental health needs of youth in the justice system, there remains little epidemiological data on the prevalence of mental health disorders within minority and indigenous groups in this population (Rawal, Romansky, Jenuwine, & Lyons, 2004). This is important considering the over-representation of such groups in criminal justice statistics.

In a sample of 657 female youth offenders, Teplin et al. (2002) compared the prevalence of mental health disorders across ethnic groups. They found that Non-Hispanic white females were significantly more likely to present with a mental health or substance use disorder than African Americans; specifically, they had significantly higher rates of disruptive behaviour disorders and substance use disorders. Hispanic females presented with significantly higher rates of generalised anxiety disorder than both African Americans and Non-Hispanic whites. When compared to African Americans, Hispanics presented with higher rates of disruptive behaviour disorders and some specific substance use disorders.

Others have compared rates of trauma and PTSD and found few racial/ethnic differences among female youth offenders (Abram et al., 2004), which is similar to findings of community studies (Breslau, Davis, Andreski, & Peterson, 1991; Kessler et al., 1995). Amongst the few findings, female Hispanics were found to be more likely to have experienced violent victimisation than African American females.

A study by Rawal et al. (2004) also analysed racial differences in mental health needs of youth in the juvenile justice system and reported conflicting results compared to the previous studies — namely, that African American youth displayed the highest level of mental health needs compared to youth of Caucasian or Hispanic descent. However, Caucasian youth presented with significantly higher rates of alcohol abuse problems and suicidal risk than their African American counterparts did. It must be noted that this sample was predominantly male.
Researchers have also found racial/ethnic differences in the prevalence of substance use disorders amongst youth offenders. Amongst both male and female youth offenders, there is evidence to suggest that Non-Hispanic whites have higher rates of substance use disorders than Hispanics and African Americans (McClelland et al., 2004; Teplin et al., 2002). Non-Hispanic whites and Hispanics had combinations of substance use disorders that involved more use of illicit drugs (other than marijuana) when compared to African Americans (McClelland et al., 2004).

Although ethnic differences in youth justice populations have not been investigated in NZ studies, the international literature suggests that differences in the prevalence of mental health disorders between ethnic groups may exist, and these differences may be important to consider in treatment.

**Summary of Mental Health and Substance Use Disorders**

As evidenced by the literature, mental health disorders and substance use disorders are ubiquitous amongst populations of female youth offenders. There is also evidence to suggest variations in the prevalence of mental health and substance use disorders amongst different ethnic groups. Although it remains unclear whether these issues precede, coincide with or follow antisocial behaviours as most studies involve detained and incarcerated youth and few examine mental health problems at different points in the youth justice system, the high rates indicate that this may be an important consideration for intervention services. If neglected, the mental health needs of female youth offenders may lead to a variety of poor outcomes in adulthood. These include substance dependence, increased suicide risk, engagement in violent relationships and poor parenting practices (Lewis, Yeager, Cobham-Portorreal, Klein, & et al., 1991). What is more alarming is that these poor outcomes may serve to perpetuate the intergenerational cycle of crime and psychiatric impairment (Russell & Marston, 2009-2010).

**Female Youth and Violence**

Antisocial behaviour may be viewed on a continuum of severity; this section will now turn to youth who exhibit behaviour at the more severe end of this continuum, those who perpetrate violence towards others. Some studies have compared violent youth to youth who perpetrate nonviolent offences, and other studies have compared violent youth to the general population of youth who do not engage in violent offending.
This section will begin with a brief review of the literature that investigates offending specialisation; a review of some studies that have specifically investigated violence in females will follow. The relationships between victimisation and violence, and psychopathology and violence will also be discussed. Focus will then narrow onto the constructs that are under investigation for the present study, namely the motivation of the offender (reactive or instrumental aggression), the victim-offender relationship, and ethnicity. Research that investigates the demographic, socio-developmental, psychosocial, and offence characteristics that are associated with these key constructs will be summarised.

It must be acknowledged that female aggression exists on a continuum of intensity which begins with relational aggression and advances through to serious physical assaults (Swift, 2011). Relational aggression is defined as negative behaviours intentionally used to damage relationships, social roles and social standing (Pronk & Zimmer-Gembeck, 2010). Although relational aggression is a salient factor for female aggression, it is beyond the scope of this study to review it in detail here; instead, this review focuses on the more severe end of this spectrum, namely physical violence.

**Offending Specialisation: Can Violent Offenders be Distinguished from Nonviolent Offenders?**

Offending specialisation is the subject of on-going empirical inquiry (Sullivan, McGloin, Ray, & Caudy, 2009). This body of research explores whether violent individuals tend to differ from those individuals who commit nonviolent crimes. Some research has reported that violent and nonviolent groups of offenders are not differentiated on the basis of developmental, family or social factors (Capaldi & Patterson, 1996; Farrington, 1991a; Piquero, 2000), and violent and nonviolent offences are interrelated (Thornton, Graham-Kevan, & Archer, 2012). However, other recent researchers have revealed somewhat mixed findings (e.g., Francis, Soothill, & Fligelstone, 2004; Lynam, Piquero, & Moffitt, 2004; Osgood & Schreck, 2007; Sullivan, McGloin, Pratt, & Piquero, 2006). Sullivan et al. (2009) proposed that the various analytic methods utilised in these studies may be the explanation for the resulting different views of specialisation (see Sullivan 2009 for a comprehensive critique on the various methods).

Of note, one study (Allen Jr et al., 2003) aimed to differentiate violent from nonviolent female youth using the Jesness Inventory (a personality measure). The results indicated that the nonviolent group were more delinquent than the violent group. The authors proposed that the offences of violent offenders are driven from emotionally charged conflicts, rather than
delinquent attitudes, and that aggression in nonviolent youth may be subdued due to their higher levels of depressive symptoms.

Given the current state of this research and the fact that little attention has been given specifically to violence specialisation in females, this area of research is inconclusive and in need of further empirical exploration. Given knowledge to date, the risk factors for violence are generally similar to the previously discussed risk factors for general antisocial behaviour, and thus will not be repeated here.

Females Use of Violence in NZ Studies

In Christchurch, Dennehy (2005) conducted an analysis of adult women who attended a “Living without Violence” intervention programme. The 92 women included ranged in age from 17 to 66 (M =33). As Māori and Pacific people were often referred to culturally appropriate services, this sample was 73% Pākehā. Although an adult sample, the research identified themes that were prominent in their childhood and adolescent years and highlighted factors that facilitated their use of violence. These themes included the presence of parental domestic violence during childhood (69%), a history of childhood sexual abuse (53%), current or past abusive relationships (73%), current or past problems with alcohol or drugs (56%), and experiences of depression (86% reported at least mild depression).

Swift (2011) has conducted perhaps the most extensive study focusing on NZ female youth violence to date. As already noted, this research investigated the use of violent and antisocial behaviour by female youth, using a mixed methodology approach. They first administered questionnaires to 3,400 year 9 and 10 boys and girls (1,704 girls), followed by running 40 focus groups with girls aged 12–18 to shed light on young women from “mainstream” settings. They also shared the perspectives of approximately 100 girls who had a history of engaging in violent behaviour and became involved in the study through their association with authorities. Of the girls who filled in the questionnaire, 34.8% indicated involvement in physical fighting.

Some of the key themes that emerged included: (1) many girl fights were instigated through competition for male attention and popularity reasons, (2) some girls got into fights to keep themselves safe and secure but also to defend those they were close to, (3) girls commonly viewed violence as both normal and natural, thus violence for self-defence was considered to be morally acceptable, (4) for some girls violence fostered their “reputation” and was critical to their social identity, and (5) violence was sometimes used as a tool to impose retribution for perceived injustices.
Victimisation and Violence

The link between victimisation and violent offending is one of the most robust findings in the literature. Blum, Ireland and Blum (2003) investigated a range of environmental, family and individual factors and found that, of these factors, victimisation had the strongest association with youth violence for both genders. A 16-year longitudinal study of over 300 males and females (Herrenkohl, Egolf, & Herrenkohl, 1997) investigated the association between victimisation at pre-school age with violent behaviour in adolescence. Results indicated that parent-reported physical discipline and self-reported sexual abuse was related to violent behaviour in adolescence. A number of studies suggest that female offenders who have experienced sexual abuse are more likely to engage in violent offending in adolescence and adulthood than their non-sexually abused counterparts (Lederman et al., 2004; Loeffler-Cobia, 2007; Margolin & Gordis, 2000; Odgers & Moretti, 2002; Siegel & Williams, 2003). Herrera and McCloskey (2003) investigated childhood sexual abuse (CSA), family violence, and delinquency. They found that CSA emerged as the strongest predictor of both violent and non-violent criminal behaviours by girls. They also found that those with a history of childhood physical abuse were more likely to behave violently towards their parents. Siegel and Williams (2003) investigated the relationship between CSA and female delinquency and reported that victims of CSA have higher rates of arrests for violent crimes when compared to non-victims.

In a longitudinal study, Herrera and McCloskey (2001) reported that females who had experienced severe physical child abuse were over seven times more likely to commit violent acts than females who did not experience abuse. These results were significant even when common co-occurring risk factors in violent families were controlled. When compared to boys with similar histories of physical abuse, girls with physical abuse histories were more likely to be arrested for a violent offence; however, interestingly, almost all violent offences perpetrated by these girls involved domestic violence. Similarly, Molnar et al. (2005) reported that adolescent girls were 2.4 times as likely to act violently if they had previously experienced violent victimisation.

Data gathered over the course of the CHDS indicates that exposure to harsh or abusive treatment during childhood may lead to elevated risks for engaging in violent offending (Fergusson & Lynskey, 1997). Other longitudinal studies have also demonstrated the link between violent victimisation and violent offending (Lansford et al., 2007; Shaffer & Ruback, 2002), with some finding more pronounced effects for females than males and for African American youth compared to American European youth (Lansford et al., 2007).
Overall, a history of maltreatment significantly increases the chances of offending in both adolescence and adulthood (Widom, 1989; 1991). There is also evidence to suggest that this relationship is stronger for young African American males and females, where those who have been abused or neglected have higher arrest rates than all other groups (Widom, 1991). It remains unclear whether specific types of maltreatment are stronger risk factors than others and whether there are unique relationships dependent on gender (Kruttschnitt & Giordano, 2009).

**Substance Use, Alcohol and Violence**

Substantial evidence points to the relationship between substance use and violent behaviour (Lennings et al., 2003). This relationship has been conceptualised into three proposed pathways by Goldstein (1989, as cited in Blackburn, 1993): (1) the pharmacological effects of the substance may directly facilitate violent behaviours (e.g., the substance may cause increased aggression or enhanced threat perception and impulsivity which subsequently instigates aggression); and/or (2) violent behaviours may be driven by a need to support the drug habit (e.g., instrumental violence such as robbery); and/or (3) the involvement in a criminal network of substance distribution and consumption facilitates conflicts which are resolved with violence.

Swift’s (2011) NZ study of 3,400 year 9 and year 10 students found 35.3% of males and 34.8% of females reported being involved in a physical fight in the previous year, and, of these, 22.7% reported that they were intoxicated with alcohol or under the influence of cannabis at the time of the fight.

Research indicates that alcohol may play both a causal and consequential role in relation to female offending (Fergusson, Lysnkey, & Horwood, 1996; Widom, Schuck, & White, 2006), and may play a role in the pathway to female’s violent offending (Widom et al., 2006). Using longitudinal data, Widom, Schuck, and White (2006) investigated the relationship between child maltreatment, problematic alcohol use and early aggression. After controlling for potentially confounding factors such as parental criminality and parental alcoholism, the results revealed two pathways to violent offending for females. The first pathway suggested that childhood abuse and neglect was predictive of problematic alcohol use, which was in turn predictive of violent arrests. In the second pathway, early aggression led to problematic alcohol use which led to aggressive behaviours, regardless of childhood abuse and neglect. The authors concluded that early interventions for children with backgrounds of maltreatment need to acknowledge the role of alcohol and early aggressive behaviours as risk factors for future violent behaviours.
In summary, literature to date suggests alcohol and drug use is related to female youth violence and it may exert its effects via a number of pathways which need to be recognised and addressed in interventions.

**Psychopathology and Antisocial Behaviour/Violence**

Although many studies have found high rates of psychopathology in antisocial female populations (see previous section), few studies investigate the correlations between specific mental health disorders and their type of offending (i.e., violent versus nonviolent offending) or susceptibility to aggression. However, studies from the general population suggest that a number of mental health problems may create a vulnerability to violence.

The link between early externalising behaviours (such as conduct and attention deficit problems) and later antisocial behaviour is well established in the literature (Fergusson & Horwood, 1995; Taylor, Chadwick, Heptinstall, & Danckaerts, 1996) and will not be reviewed in detail here. Of note, one study by Burnette and Newman (2005) investigated the link between conduct disorder symptoms and the later development of antisocial personality disorder (ASPD) in a sample of 261 women with histories of antisocial behaviour. They found CD symptoms characterised by interpersonal and physical aggression were predictive of later ASPD. This finding highlighted that the *type* of CD behaviours (as opposed to the *number* of CD symptoms) may be an important indicator of subsequent serious antisocial personality pathology and violent offending.

The relationship between internalising disorders and aggression is not as well understood; however, a few studies have demonstrated relationships between specific mental health difficulties and violent behaviour.

Wasserman and colleagues (2005) investigated gender differences in psychiatric disorders in a sample of 991 (200 females) youth offenders. They found that females who were involved in a violent offence were three to five times more likely to report anxiety disorders than any other group (nonviolent females and males; violent males). The authors also found that females charged with violent crimes were three times more likely than their male counterparts were to present with a disruptive behaviour problem. They found no differences in the prevalence of substance use disorders amongst females committing nonviolent and violent offences (Wasserman et al., 2005).

In both males and females in a non-offending population sample, PTSD has been linked to difficulties controlling impulsive behaviour when distressed (Bornovalova, Ouimette, Crawford, & Levy, 2009), a characteristic which may have the potential to contribute to
aggressive behaviours and offending (Obsuth et al., 2009-2010). This has also been echoed in male samples of adolescent offenders, where those with PTSD had lowered restraint, impulse control and suppression of aggression (Steiner, Garcia, & Matthews, 1997).

Dissociation is also relevant when seeking to understand violent behaviour, and has been found to be common amongst violent offenders (Moskowitz, 2004). In a review of the literature, Moskowitz concluded that increased dissociation scores or diagnoses were linked with increased violence, with this finding demonstrated across a variety of populations (including adolescents). Dissociation may also play a key role in the intergenerational cycle of violence, as research has suggested that, of abused individuals, those that exhibit dissociative symptoms are more likely to abuse their own children (Egeland & Susman-Stillman, 1996; Singh Narang & Contreras, 2000). Egeland and Susman-Stillman (1996) proposed that women who experienced dissociative symptoms may have been less able to empathise with their children, which increased the propensity for abuse.

There is some evidence to suggest that depression may be a risk factor for aggression in female adolescents but not for their male counterparts (Knox, Carey, & Kim, 2003; Knox, King, Hanna, Logan, & Ghaziuddin, 2000). Aggression may present more often in depressed females than their non-depressed counterparts because females are more likely to demonstrate expressive aggression: “a loss of control over themselves, for example, when overcome by negative emotions” (Knox et al., 2003, p.229) as opposed to instrumental aggression in response to a depressed or irritable mood.

Overall, to date, relatively little is known about the psychological causes and course of development for violent antisocial behaviour in females, and few definitive conclusions can be made.

Another aspect of violence to consider, which may aid understanding of violent behaviour, is the motivation or function of violence.

**Violence Motivation: Instrumental and Reactive Violence**

Aggression during childhood has been correlated with various aspects of maladjustment such as depression, emotional dysregulation, poor peer relationships and victimisation; moreover, later in life it has been associated with peer rejection, academic failure, adolescent and adult antisocial behaviour, and unemployment (Coie & Dodge, 1998; Farrington, 1991b; Hodges, Card, & Isaacs, 2003). However, the concept of aggression may be heterogeneous, and when it is reconceptualised and subdivided in different ways, researchers conclude that all aggressive behaviour may not be equally maladaptive (Card & Little, 2006).
A common way to divide aggressive behaviour into subtypes is by examining the function or motivation of the aggressor (Card & Little, 2006). These motivations can be separated into instrumental and reactive. Instrumental aggression (also called proactive aggression or “cold-blooded aggression”) refers to “deliberate acts that are directed toward obtaining desired goals” (Card & Little, 2006, p. 467). Instrumental aggression is believed to develop from a combination of exposure to and endorsement of aggression (Dodge, 1991; Vitaro, Brendgen, & Barker, 2006). Reactive aggression (also called defensive aggression or “hot-blooded” aggression) refers to “angry, often emotionally dysregulated, responses to perceived offences or frustrations” (Card & Little, 2006, p. 467). Reactive aggression is believed to develop from experiences of poor attachment relationships along with an environment characterised by inconsistency and punishment that leads to a deficit in behavioural regulation skills, and leaves the child hypervigilant to threat cues (Dodge, 1991; Vitaro et al., 2006).

**Theoretical backgrounds of instrumental and reactive violence**

The concepts of instrumental and reactive motivations for aggression stem from different theoretical backgrounds. Instrumental aggression may be explained by Social Learning Theory (Bandura, 1973, 1986), in the same way that general antisocial behaviour is explained. This theory posits that individuals learn violent behaviour via observation of others, such as family, friends, others in the neighbourhood or through the media (Akers, 1998; Akers & Sellers, 2004). There are three major mechanisms by which others teach an individual to engage in violent behaviour: (1) an individual imitates an observed violent act, particularly if modelled by close others and if it results in reinforcement, (2) others may reinforce the individual’s violent behaviour, which subsequently leads the individual to expect future reinforcement in similar circumstances, and (3) others teach beliefs that are supportive of violence (Agnew, 2009). According to this theory, some females may be more likely than others to engage in violent behaviour because of their increased likelihood of associating with individuals who model and reinforce violent behaviour, and also teach beliefs favourable to violence (Agnew, 2009). In regards to aggressive behaviours, Bandura’s Social Cognitive Learning Theory (Bandura, 1973, 1986) also describes that aggressive behaviour arises from an individual’s high self-efficacy for aggression, positive or favourable outcome expectations following the aggression, and their high regard or valuing of outcomes obtained through aggression.

On the other hand, reactive aggression is explained by the Frustration–Aggression Model (Berkowitz, 1989), which posits that aggression occurs as a result of frustration, anger, or perceived threat or provocation (Connor et al., 2004; Fite, Schwartz, & Hendrickson, 2012). The
Frustration-Aggression theory was first developed by Dollard and colleagues in 1939, and refined by Berkowitz (1989). Initially the model posited that aggression was a result of frustration in response to the blocking of an individual’s efforts to attain a valued/gratifying goal. On further development of this model, Berkowitz (1989) proposed that negative affect played an important role. Aggressive behaviour is understood to be the end result of a series of cognitive-affective processes, where negative affect leads to feelings of aggression, and subsequently higher-order cognitive processing which precipitates the aggressive act. This expanded theory acknowledges that this model may only apply to “hostile” aggressive acts.

These motivations for aggression have been found to be highly intercorrelated. For example, Card and Little (2006), in their meta-analysis of 36 studies ($N = 17,360$), reported the intercorrelation between the two types of aggression produced a sample-size-weighted average correlation of $r = .68$, 95% CI $[.67–.69]$, $Z = 108.77$, $p < .001$, but alternatively factor analytic studies have provided sufficient support for the distinction between instrumental and reactive aggression (Day, Bream, & Pal, 1992; Fite, Rathert, Colder, Lochman, & Wells, 2012; Poulin & Boivin, 2000; Vitaro & Brendgen, 2011).

As there is little literature that solely examines female youth, the following sections will review the literature that looks at all samples of children/youth, and where available it will comment on gender differences that have been found.

**Correlates of Instrumental and Reactive Aggression: Characteristics of the Offender**

Card and Little (2006) conducted a meta-analysis of 42 studies ($N = 20,266$ children and adolescents) to investigate the differential relations of instrumental and reactive aggression to various aspects of psychosocial adjustment. Compared to instrumental aggression, reactive aggression was found to be more strongly associated with internalising problems, emotional dysregulation, attention deficit/hyperactivity disorder symptoms, low prosocial behaviour, peer rejection and peer victimisation. The authors concluded that reactive aggression is more strongly related to psychosocial maladjustment than instrumental aggression is (Card, 2006).

Unfortunately, this study was unable to draw conclusions about gender differences in these relationships as few studies in the sample investigated whether the relationship between the different motivations for aggression and psychosocial maladjustment differed according to gender. Moreover, this study only included studies which had “normative” samples, thus excluding those with samples comprised of children/youth in only criminal or psychiatric settings. It is unknown how findings would differ in these populations. The authors also acknowledged that the majority of the studies included in the meta-analysis relied on teacher
reports of instrumental and reactive aggression, and future work using a range of information sources is necessary.

Other research has demonstrated a link between instrumental aggression during childhood/adolescence and substance use in both cross-sectional and longitudinal studies, and this link has been supported for males and females (Fite, Schwartz, et al., 2012). In particular, it has been linked to problem drinking (Fite, Schwartz, et al., 2012). In contrast, few studies have examined the relationship between reactive aggression and substance use, and in those that have, findings have been inconclusive (Fite, Schwartz, et al., 2012). One study that investigated gender differences reported that reactive aggression was not significantly related to substance use for females, and was only weakly related for males (Connor, Steingard, Anderson, & Melloni, 2003). Other studies have found that reactive aggression is associated more strongly with illicit substance use than alcohol use (Fite, Colder, Lochman, & Wells, 2008; Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2010).

In a community sample of 147 children/adolescents, Fite et al. (2012) investigated other contextual influences of instrumental and reactive types of aggression including peer delinquency and negative life events. They found that best-friend delinquency demonstrated a positive association with instrumental aggression, and was not related to reactive aggression. Negative life events were positively associated with both types of aggression but this relationship was stronger for reactive aggression. The authors believe these findings are consistent with the theory that instrumental aggression emerges consequent to exposure and endorsement of aggressive behaviour (Dodge, 1991; Vitaro et al., 2006), as delinquent peers may support aggressive behaviours through positive reinforcement and modelling of antisocial behaviours (Warr, 1996). Fite et al. explain that negative life events may contribute to reactive aggression through the “stress-process framework” whereby negative events (such as those that are unexpected, and where the child/adolescent has little control) adversely impact on the child’s ability to regulate behaviours and emotions, a deficit that typifies reactive aggression. Moreover, disruptions in attachment (an example of a relatively common negative life event) may also lead to an inconsistent environment and poor behavioural regulation skills (Shaw, Gilliom, Ingoldsby, & Nagin, 2003). Fite et al. conclude that negative life events may be more strongly linked to reactive aggression (as opposed to instrumental aggression) because some negative life events model aggression, and may thus precipitate instrumental aggression, but not all negative life events provide aggressive models for children but do provide conditions that underpin the emotional dysregulation that is associated with reactive aggression. The cross-sectional
methodology of this study means that the results cannot indicate anything about the
developmental course of the variables and causation cannot be assumed.

Connor et al. (2004) investigated instrumental and reactive aggression in a sample of 323
psychiatrically referred youth and aimed to identify demographic, historical, diagnostic and
treatment correlates of the two types of aggression. The authors generated correlations between
the variables and reported that a family history of alcohol or substance abuse and self-reported
alcohol and substance abuse were correlated with instrumental aggression but not reactive
aggression. They also found that a parental history of violence or arrest was correlated with both
reactive and instrumental aggression. Of the abuse variables, physical abuse was correlated with
both forms of aggression, however sexual abuse was only correlated with reactive aggression.
Using regression analyses, the authors found that a diagnosis of a disruptive behaviour disorder
(CD, ODD, ADHD), hyperactive/impulsive behaviour, and self-reported expressive hostility
were associated with both types of aggression. Variables that were uniquely associated with
reactive aggression included a history of physical or sexual abuse. The total number of
psychiatric diagnoses was also positively associated with reactive aggression. Two variables
were uniquely related to instrumental aggression and these included the presence of a substance
use disorder and a history of family violence. It must be noted that this study was cross-sectional
in design, and therefore causality cannot be concluded from the results.

Summary

In summary, instrumental and reactive aggression are correlated forms of aggression, however
their distinction as separate forms of aggression is supported by both differential theoretical
explanations and empirical evidence, as they have been found to be differentially related to a
range of social and behaviour outcomes (Card & Little, 2006) and contextual factors (Fite,
Wimsatt, et al., 2012).

Reactive aggression has been found to be more strongly correlated with various indices
of psychosocial maladjustment, such as internalising problems, emotional dysregulation,
attention deficit/hyperactivity disorder symptoms, low prosocial behaviour, peer rejection and
peer victimisation when compared to instrumental aggression (Card & Little, 2006). It is also
found to be more strongly related to a range of negative life events (Fite et al., 2012), such as
experiences of physical and sexual abuse. Alternatively, instrumental aggression has
demonstrated links with substance use and disorders (Connor et al., 2004; Fite, Schwartz, et al.,
2012), best-friend delinquency (Fite et al, 2012), family violence (Connor et al., 2004), and
family history of alcohol or substance abuse (Connor et al., 2004). Given that the majority of
studies reviewed are cross-sectional in design; there is a need for longitudinal and experimental research to investigate the temporal precedence in the relations of aggression motivation and correlates of psychosocial adjustment (Card & Little, 2006).

It is important to investigate the contextual, social and behavioural correlates of reactive and instrumental aggression subtypes, as information on unique needs may be useful for the refinement and implementation of intervention strategies. For example, teaching emotion regulation and social skills may be important for those engaging in reactive aggression. No known studies have examined the relationship between subtypes of violence and offending characteristics in samples of female youth.

**Victim-Offender Relationship**

Within the literature on adolescent violence there is also increasing research on a concerning group of adolescents who perpetrate violence against their families (Elliot et al., 2011), and some indications that they may differ from other offending or conduct disordered adolescents (Ibabe & Jaureguizar, 2010; Nock & Kazdin, 2002). Although this issue has been relatively neglected in the literature, a small body of research describes the characteristics of this group. However, within groups of violently offending youth, there is a lack of literature describing how these youth differ from those who direct their aggression and violence towards non-family members. A review of the characteristics of family-violent youth will follow.

**Adolescent Violence towards Family Members**

In a review of the literature, Kennair and Mellor (2007) describe that the prevalence of parent abuse in the US ranges from 7% to 18% in two parent families and occurs in approximately 29% of one parent families. Swift (2011) found comparable rates in a NZ study of 1,704 female youth, where she reported 8.4% of female youth indicated they had hit their mother or female guardian, and 7.4% indicated they had hit their father or male guardian. The rates of mothers hitting their daughters and fathers hitting their daughters were 17.7% and 15.3% respectively.

Ibabe and Jaureguizar (2010) reported that parentally abusive youth were more likely to be from one-parent families when compared to youth facing other charges. The higher rate found in one-parent families may be due to the associated factors such as custody conflicts, lack of social supports and financial difficulties that may trigger a deterioration in the family relationships between parents and children (Ibabe & Jaureguizar, 2010).

In terms of sibling violence, Swift (2011) found that 39.1% of year 9 and 10 school girls \( (n = 1,704) \) indicated that they had hit their brothers, and 48% reported being hit by their brothers.
The rates for sister sibling violence were similar, with 33.9% admitting they had hit a sister and 42.6% indicating they had been hit by a sister.

**Characteristics of the offence and victims.** Research on this phenomenon indicates that mothers are most frequently the victims of this type of abuse for both males and females (Gallagher, 2008; Ibabe & Jaureguizar, 2010; Walsh & Krienert, 2007). This finding has been attributed to perceptions of mothers as weak/powerless, society messages condoning the acceptability of using violence to control women, and the mother’s role as the primary caregiver, which increases their accessibility and chances of being victimised (Cottrell & Monk, 2004). It must also be considered that this disproportionate rate may reflect mothers’ willingness to report the abuse compared to fathers (Walsh & Krienert, 2007).

Significant rates of injuries have been reported and include injuries such as cuts, bruises and broken bones that result from a variety of methods, which include punching, kicking, biting and the use of weapons (Cottrell & Monk, 2004).

**Characteristics of the offender.** Findings on gender are inconclusive. Some studies suggest that males are more likely perpetrators than females (Cochran, Brown, Adams, & Doherty, 1994; Harbin & Madden, 1979; Laurent & Derry, 1999; Walsh & Krienert, 2007). Others have found no gender differences (McCloskey & Lichter, 2003), and some studies have found slight gender differences, with more females than males engaged in assault against their parents (Agnew & Huguley, 1989; Pagani et al., 2004). A meta-analysis of a total sample of 3,660 youth who had been violent towards their parents found that 72% were males (Gallagher, 2008). Pagani et al. (2004) attribute the differences found in the gender ratios to the type of methodology used, with clinical, forensic and anecdotal methods finding males as more likely perpetrators while epidemiological studies find minimal differences between males and females.

In terms of ethnicity, some researchers have reported no significant differences (Cornell & Gelles, 1982; Paulson, Coombs, & Landsverk, 1990); however, others have found higher assault rates in Caucasian families as opposed to other racial/ethnic groups (Agnew & Huguley, 1989; Charles, 1986; Hartz, 1995).

There is also conflicting evidence for the impact of socioeconomic status (SES). Some studies indicate that parent assault is more prevalent among middle and upper class families (Charles, 1986; Paulson et al., 1990), while others report no relationship to social class (Agnew & Huguley, 1989; Cornell & Gelles, 1982).

Swift’s (2011) NZ study reported that many girls mentioned they would never hit their mothers as they held a special place in the family and held respect for them. However, for other girls, their mothers held no special status and they responded to them as they would to others that
provoked them. If their mothers hit first they felt justified to retaliate with violence. This is in line with the finding that youth who assault their parents often have limited emotional attachment to them (Agnew & Huguley, 1989; Libon, 1989; Paulson et al., 1990; Peek, Fischer, & Kidwell, 1985). Cottrell and Monk (2004) suggest that this may be related to the finding that a significant proportion of assaultive youth have been abused by their parents (physically or sexually) or have been witness to partner assault. Similarly, Elliot et al. (2011) reported that how much an adolescent perceived themselves to matter to the family was predictive of violence. The authors describe that “failing to matter” to the family may exert its effect by damaging a youth’s self-esteem and self-image, which consequently means he or she then has little to lose by violently lashing out at others.

Some researchers have suggested links between abusive adolescents and mental health problems. The various clinical diagnoses noted include personality disorders, learning disorders, schizophrenia, bipolar, ADHD, reactive attachment disorder and disruptive behaviour disorders (Charles, 1986; Cottrell & Monk, 2004; Evans & Warren-Sohlberg, 1988; Ibabe & Jaureguizar, 2010; Wells, 1987). In their qualitative study, Cottrell and Monk (2004) also found that youth often had difficulties with affect regulation, interpersonal skills and impulse control, and these deficits may have increased the potential for conflict with their parents. In some cases, parental mental health problems may be a contributing factor (Cottrell & Monk, 2004).

In a Spanish study of 103 youth, Ibabe and Jaureguizar (2010) compared three groups: (1) youth who displayed violence towards parents, (2) youth with other types of offences, and (3) youth who displayed both violence to parents and had committed other offences. They found that the latter group had lower self-esteem than youth with other types of offences (the second group). The parentally abusive group displayed lower scores on “autonomy” than the other two groups. Those in the parentally abusive group also displayed lower scores for “empathy” than the group with other types of offences.

Nock (2002) employed a sample of youth from an outpatient treatment service for children and adolescents referred for oppositional, aggressive and antisocial behaviour \(N = 606; 151\) girls. Within this sample, the authors compared parentally aggressive children/youth to a control group of children/youth with general conduct problems. They found that the parentally aggressive children/youth had increased symptoms of ODD, were higher in general aggression and more demanding of their parents. They were also identified as having lower frustration tolerance and poorer capacity to adapt to stressors. Family characteristics that were associated with parentally aggressive children/youth included increased parenting stress and poorer
interpersonal relationships. In addition, parentally aggressive children/youth were more likely to be from two-parent, European American families of higher socioeconomic status.

Alcohol and drug use is also identified as a factor in parent abuse, for example Ibabe and Jaureguizlar (2010) found that adolescents who abuse their parents showed higher use of the drugs cocaine and hashish than other offenders. However, it is unknown to what extent alcohol and drug use is directly related to violence (Charles, 1986; Ellickson & McGuigan, 2000; Evans & Warren-Sohlberg, 1988; Price, 1996). For example, Walsh and Krienert (2007) reported that the vast majority of their sample were not influenced by alcohol or drugs at the time of the offence. Cottrell and Monk’s qualitative study (2004) sheds some light on how substance use is related to parent abuse. They found that parents and service providers reported that substance misuse led to significant changes in their child’s behaviour, school performance, and peer relationships, and subsequently increased levels of conflict in the family home. Youth in this study reported that they sometimes abused their parents when they were “high” or “coming down”, but typically violence was triggered by an argument with their parents over substance misuse related issues. Parental substance abuse may also be a risk factor for parent abuse (Cottrell & Monk, 2004; Pagani et al., 2004). In a longitudinal study, Pagani et al. reported that parental substance misuse increased the risk of adolescent perpetrated violence against mothers by over 70%, likely by increasing the probability of family conflict and dysfunction (Cottrell & Monk, 2004).

In regards to maltreatment, Cottrell and Monk (2004) found that a number of female youth had experienced sexual abuse perpetrated by the father/stepfather in the family. The aggression from these youth was motivated by a need for self-protection, or as an expression of rage directed at the offender; in other cases, aggression was directed at the non-abusive parent as a means to express resentment that was felt for their failure to protect against the abuse. The authors also reported that physical abuse, emotional abuse, neglect and witnessing domestic violence were ubiquitous in the backgrounds of youth who were aggressive towards their parents. A hypothesis of bi-directionality of domestic violence has also been proposed (Ibabe & Jaureguizlar, 2010), whereby the violence committed by parents on their children is related to violence perpetrated by children on their parents.

In terms of parenting styles, both overly controlling parenting (Cottrell & Monk, 2004) and permissive parenting have been identified as contributing factors for abusive behaviour from youth (Cottrell & Monk, 2004; Micucci, 1995; Omer, 2000). Some early studies have indicated that parentally abusive youth tend to associate with other youth who are violent in their homes (Agnew & Huguley, 1989; Cottrell & Monk, 2004; Kratcoski & Kratcoski, 1982). In their
 qualitative study, Cottrell and Monk reported that youth described how their peers would model that violence could be used as an effective means to gain power and control, which led them to employ this method with their own parents. Cottrell and Monk also found that youth who were bullied by their peers would utilise abusive behaviour against their parents as a strategy to compensate for their feelings of powerlessness, and to express anger in a safe context.

Researchers have found that childhood disruptive behaviours at school are predictive of aggression by youth against their mothers (Pagani, Larocque, Vitaro, & Tremblay, 2003; Pagani et al., 2004). Cottrell and Monk (2004) also identified that abusive youth often had behavioural and academic problems at school. The authors describe that this early failure leads youth to internalise the labels ascribed to them, which increases their use of negative or attention seeking behaviours; this subsequently led to involvement in antisocial activities, such as substance misuse and crime, and consequently higher levels of family conflict. Ibabe and Jaureguizar’s (2010) study comparing parentally abusive youth to those who committed other offences found that youth in the former group displayed significantly more adaptive problems and learning difficulties.

**Summary**

Children and youth who perpetrate violence against their caregivers have been associated with a host of factors. Research indicates that they are more likely to be from one-parent families, and a higher incidence is observed amongst Caucasian families. They are described as having poor emotional attachments to their parents, and often have experienced maltreatment at the hands of their caregivers; they may feel that they do not “matter” to their families. In addition, these youth may struggle with mental health problems, learning difficulties, poor affect regulation, poor interpersonal skills, low impulse control, low self-esteem, low empathy, low frustration tolerance, and may be more demanding of their caregivers. These youth may be higher in ODD symptoms, general aggressive behaviours, and may also struggle at school with behaviour problems, academic problems, and victimisation by their peers. Risk factors related to parenting may include both overly controlling and permissive parenting styles, high parental stress, parent mental health/alcohol and drug problems.

The existing studies often compare youth who perpetrate violence against their parents/family members to youth who do not exhibit these behaviours at all. Therefore little is known about how these youth differ from youth who are violent in the community, and how their risk factors and treatment needs may differ. As youth who commit violent offences against their
families and against others often end up in the same services, identifying unique treatment needs is important.

**Prevention and Intervention**

The literature has recognised risk factors and developmental trajectories that assist to explain antisocial and violent behaviour, which are helpful in the development of effective interventions that aim to prevent and reduce such behaviours (Moretti, Jackson, & Obsuth, 2009-2010). It is beyond the scope of this review to provide a comprehensive overview of all treatment approaches for youth offending. However, the dominant types of prevention and intervention approaches are briefly reviewed here, as the risk factors and correlates of different violent profiles identified in the present study may have implications for intervention efforts. This section will consider the prevention and intervention strategies that have been proven efficacious for all antisocial youth (violent and nonviolent, males and females), as often these programmes are not gender specific and are targeted at general antisocial behaviour, not solely aggression and violence. Research examining the influence of gender on treatment effectiveness is scarce and is a priority that should precede the development of gendered services (Moretti et al., 2009-2010).

Researchers have discussed the importance of early intervention and prevention strategies. Prevention of child abuse and neglect has been advocated, and this is underscored for females given the high rates and impacts of trauma (Moretti et al., 2009-2010). In support of this, programmes targeted at high risk parents before the birth of their child and programmes implemented with families when their child is first identified to have significant behaviour problems have been found to be effective (Moretti et al., 2009-2010). For example, Reynolds, Mathieson and Topitzes (2009) reviewed 14 early intervention programmes for children under 5 and reported a 30% reduction in maltreatment rates.

In addition, other programmes that extend beyond early childhood have established efficacy for decreasing antisocial behaviour. Typically, these programmes have focused on aspects of parenting and the parent-child relationship (Moretti et al., 2009-2010). For example, the Incredible Years parent programme is an early intervention programme developed in the United States for parents of children with conduct problems. The programme aims to strengthen the parent-child relationship, reduce the child’s challenging behaviour/conduct problems and improve their social competence and emotional regulation skills in order to protect from negative outcomes such as violence, drug use and delinquency (Webster-Stratton, 2005). Evaluations of the Incredible Years programme support its efficacy for increasing positive parenting, reducing
harsh parenting and decreasing child home behaviour problems (Webster-Stratton & Reid, 2010). A similar programme with established efficacy is the Triple P – Positive Parenting Program, which aims to prevent the onset of developmental, behavioural and emotional problems by providing education to enhance parents’ knowledge and skills (Sanders, 2012).

Research has also highlighted the importance of the parent-teenager relationship in determining a range of mental health and social functioning outcomes, with healthy parent-teenager relationships demonstrating protective effects for engagement in risky behaviours (Moretti et al., 2009-2010). Emerging attachment–focused interventions that aim to foster and strengthen the attachment relationship between youth and their caregivers include Attachment Based Family Therapy (Diamond, Reis, Diamond, Siqueland, & Isaacs, 2002) and Multiple Family Group Intervention (Keiley, 2002), which show some promising results (Moretti et al., 2009-2010). The Connect Parent Group (Moretti, Braber, & Obsuth, 2009) intervention also emphasises parent-teenager attachment; the programme assists parents to step back from conflict and employ empathy and interpersonal skills to support their adolescent’s healthy autonomy, while simultaneously setting appropriate limits. Evaluation of the programme has demonstrated reductions in adolescents’ aggressive and antisocial behaviour and other mental health problems (Moretti & Obsuth, 2009), and that it was equally effective for males and females.

Systemic approaches that integrate multiple treatment components are common interventions for offending youth. One such approach is Multisystemic Therapy (MST; Sheidow & Woodford, 2003) which has demonstrated efficacy for reducing antisocial behaviour. MST tailors each treatment programme to the unique needs of each family and may include family therapy, parent training and cognitive behaviour therapy for the adolescent. MST is an intensive wraparound approach and considers the adolescent’s problem behaviour across the home, school and community. Moretti et al. (2009–2010) emphasise the relevance of tailoring intervention programmes to a family’s specific needs, particularly for complex youth with multiple mental health difficulties, such as has been found with female youth. Moretti et al. also highlight that females may require full-spectrum screening to assess their externalising and internalising disorders. Interventions may be shaped according to the developmental sequence of their disorders; for example, females who develop substance problems subsequent to trauma may be distinguished in their treatment approach from females who develop substance problems in relation to conduct disorder and ADHD (Moretti et al., 2009-2010).

Tailoring programmes to ensure cultural sensitivity is another important factor for intervention services (Moretti et al., 2009-2010). Emerging research increasingly focuses on disaggregating specific risk factors that underlie ethnicity and illuminates their differential
influences on antisocial behaviour in African Americans versus Caucasians (Bruce, 2004). In New Zealand, programmes based specifically on Māori cultural values and principles may be most effective, as research has demonstrated culturally centred programmes have led to improved outcomes for Māori youth (Doone, 2000).

In summary, prioritising the prevention of child maltreatment and family violence through early intervention programmes is important. An individual assessment approach for each young person, and subsequent implementation of interventions that are tailored to the unique needs of each, is important. Extensive multi-system approaches that appreciate each youth’s multifaceted levels of influence have been found to be effective. Moreover, enhancing parent-teenager relationships has also been demonstrated as an important treatment target. The importance and effectiveness of culturally sensitive programmes has also been highlighted.

To date, the development of specific gender tailored treatment programmes for violent female youth is in its infancy.

The Present Study

The present study is primarily exploratory and descriptive, offering insight into the characteristics of offending female youth, which may help to generate hypothesis testing, inform follow-up qualitative studies and guide the development of clinical work. The identification of different profiles/subtypes for violent female youth may assist in designing appropriate interventions for an individual female youth, and may also inform possible avenues to explore upon assessment of a youth’s needs, and when considering what types of intervention would be useful (Ibabe & Jaureguizar, 2010).

It is hoped that this could inform treatment interventions for female offenders by informing the development of interventions which take both gender and ethnicity into account. A deeper understanding of the links between aggression and different profiles of violent youth offenders (in terms of violence motivation, victim-offender relationship, and ethnicity) could help develop more effective and targeted prevention and intervention strategies for female youth. Another focus will be to develop a greater understanding of the risk factors and pathways to violent offending for female adolescent offenders, which may inform appropriate early intervention and prevention strategies.

The present study seeks to investigate the following aims in a sample of female youth offenders referred for psychological services in the Auckland region:
(1) To describe the sample of female youth in terms of their demographic, psychosocial (historical background and diagnoses) and offending backgrounds, and identify any factors that distinguish the youth with violent offences from those who had nonviolent offence histories.

(2) To investigate the demographic, psychosocial (historical background and diagnoses) and offence-related correlates of instrumental and reactive aggression in a sample of female youth who perpetrated a violent offence.

(3) To investigate the demographic, psychosocial (historical background and diagnoses) and offence-related correlates of youth who perpetrate violence against their family members and youth that perpetrate violence in the community.

(4) To investigate the demographic, psychosocial (historical background and diagnoses) and offence-related correlates of violent Māori and Pākehā female youth.
CHAPTER TWO: METHOD

Overview

This study involved a retrospective file audit. Official client files held by the Regional Youth
Forensics Service (RYFS) in Auckland were the source of data for this study. These files were
from adolescents who were accepted for an assessment or were seen for treatment.

Setting

RYFS provides mental health assessments for youth involved in the justice system whom have a
suspected mental health disorder. For this reason, this population may be different from the
general population of youth offenders. RYFS see adolescents aged 13–17 for the entire
Auckland region and referrals are accepted from the child protection service, Child, Youth and
Family (CYF), police, courts or youth advocates. The RYFS team also provides treatment to
females in the secure residential facility, Korowai Manaaki, Youth Justice North (CYF).

The agency provides a comprehensive clinical assessment with the involvement of the
adolescent’s family or legal caregivers. With consent from the adolescent and family, collateral
information is also sought from schools, police, CYF and other services in which they have been
previously involved. From the clinical interviews and the collected information, a report is
produced, which describes the adolescent’s offending behaviours and psychosocial history. In
addition, the clients also complete standardised psychometric measures. These can include
various measures of mental health, personality, trauma symptoms, measures of substance use,
and measures of risk for reoffending.

Sample

A potential sample of 271 female adolescent cases that were referred to RYFS between 1
January 2005 and 1 July 2011 were identified from RYFS client register. From this list, 87 were
referred to RYFS but never reached the stage of assessment and hence no files were created but
184 cases were seen for an assessment or treatment and had sufficient information in their files.
This resulted in an audit of the files of 184 female youth.

Variables of Interest

The client information sheet (CIS) was developed to collect information on the adolescent’s
demographic, psychosocial background and offending behaviour (See Appendix A). In addition
to this information, results from the Trauma Symptom Checklist (TSCC; Briere, 1996) were also collected. The TSCC is a psychometric inventory which is used to assess trauma-related psychological distress. The CIS and the TSCC are described in detail below.

**Client information sheet (CIS).** All data for the present study were extracted and coded from the files of eligible youth and recorded on a client information sheet. The client information sheet was created for the purposes of this study, and was generated from a review of the literature on female youth offenders. The researcher’s supervisor (a psychologist with experience working in the area of youth offending) provided consultation and feedback to assist in the development of the client information sheet. Sections of the CIS were developed to obtain descriptive information and variables related to the main aims of the study. The CIS was used in conjunction with a coding scheme that defined in detail how each variable was to be coded (see Appendix B).

The information available in each file was not standardised, and therefore many variables were coded as: (1) evidence of X from file information, or (2) no evidence of X from file information. Thus “No evidence” cannot be taken to mean that a variable was not present, but may merely indicate that a youth and/or their family members were not specifically questioned about a certain topic. The CIS comprised 10 sections which are summarised as follows. The reader is referred to the coding scheme for further details.

**Demographic variables.** This information included the client’s age at referral, ethnicity as it appeared in the file and socioeconomic deprivation index score (SED). The SED score was ascertained for each client by matching the adolescent’s home address (parental address or mother’s address if parents were separated) to the corresponding meshblock score of the 2006 NZ Index of Deprivation (Salmond, Crampton, & Atkinson, 2007).

**Psychosocial variables.** The psychosocial variables were separated into further subgroups, which included mental health variables, substance use variables, family background variables, school variables, peer and other problem behaviour variables, developmental background variables, and maltreatment variables. These groups of variables are summarised below.

**Mental health variables.** This section noted down any historical or current diagnoses, and any engagement in deliberate self-harm behaviours. The total number of mental health diagnoses was also recorded.

**Substance use variables.** This section noted if the youth had a history of using any of the following categories of substances; cannabis, stimulants, opiates and other drugs (e.g., hallucinogens, inhalants). The total number of categories was also recorded.
**Family background variables.** This section recorded information about the adolescent’s family background and included the following: parental marital status, amount of contact with mother, amount of contact with father, number of changes in caregivers, child youth and family (CYF) care history, family mental health problems, parental illicit drug abuse, parental alcohol abuse, parental criminality, parental incarceration and sibling criminality.

**School variables.** This section recorded information about the adolescent’s education history and included information on the following: number of schools attended, school behavioural problems, truancy, school learning difficulties and school exclusions.

**Peer and other problem behaviour variables.** This section included variables such as perpetrating or being victim to bullying, gang involvement, involvement with a delinquent romantic partner, history of pregnancy, engagement in prostitution, or history of running away/absconding.

**Developmental background variables.** This section included variables such as stress during pregnancy, cognitive impairments, anger problems, grief/bereavement issues, poor social skills, ADHD type symptoms, and age when problem behaviours began.

**Maltreatment variables.** Maltreatment history was examined in this section. Histories of sexual abuse, physical abuse, emotional abuse and neglect were determined by information in the files. This included suspected abuse that may not have been substantiated. This section also included exposure to domestic violence in the home and the total number of maltreatment types.

**Offending variables.** This section contained information on the types of offences committed by each youth.

The Australian and New Zealand Standard Offence Classification (Australian Bureau of Statistics, 2011) was used to code the types of offences/charges carried out by each youth. This classification system has eight categories of offences (violent offences, other offences against the person, property offences, drug offences, offences against the administration of justice, offences against good order, traffic offences and miscellaneous offences). Each youth was coded positively or negatively for each offence category, depending on if she had evidence in her file information of ever committing a crime or having a charge of that description.

**Violent or nonviolent.** Youth were coded into two groups based on the offending information in their files. For the purposes of the current study, a youth was coded as *violent* if she had evidence in her file information of having committed an offence where she had caused intentional physical harm to a victim (Nock & Kazdin, 2002). All other youth were coded as nonviolent.
For those youth classified as “violent”, further details were collected on the adolescent’s index violent offence, which refers to the offence for which she had been referred for assessment. Where there was more than one index violent offence, the most serious violent offence according to the Violence Assessment Scheme (VAS; Alia-Klein, O'Rourke, Goldstein, & Malaspina, 2007) was examined. The VAS is discussed in detail below. Only one violent offence per offender was examined in this study.

NZ police codes. Each youth’s most violent offence was coded according to the NZ police codes. This classified each offence as one of the following: homicide, kidnapping and abduction, robbery, grievous assault, serious assault, minor assault, intimidation/threats or group assemblies. See Appendix C for further details on these offence codes.

Motivational subtypes of violence. Given the present study’s retrospective approach, the study examined each youth’s most serious index violent offence that was detailed in the file information. Although youth in the present study could have had a history of committing other violent offences (that were not recorded in file information), analyses were limited to the index violent offence due to the potential lack of systematic information available in the files. Support for this approach of assigning individuals rather than acts to subtypes of violence has been demonstrated by Woodworth and Porter (2002) and Douglas (2010) who found significant group differences between offenders based on this classification process.

The violence that comprised the adolescent’s index offence was classified using Woodworth and Porter’s (2002) Likert-type scale as primarily instrumental, primarily reactive, reactive-instrumental or instrumental-reactive. This coding scheme has been reported to have acceptable/high reliability ($K = .81$; Woodworth & Porter, 2002), and has been used by others (e.g., Douglas, 2010). The offences were coded according to the closest approximation to these categories.

Primarily reactive. Following Woodworth and Porter’s (2002) classification system, in order for an offence to be rated as purely reactive, there needed to be evidence that the offence appeared spontaneous/impulsive and lacked planning. The violence appeared to be driven by a rapid and powerful affective reaction, with no goal other than to harm the victim after an interpersonal conflict, dispute or provocation.

Primarily instrumental. To qualify for this rating, there needed to be evidence that the index offence was planned and goal orientated in nature (e.g., to obtain money, drugs or revenge), and no evidence that the violence was committed due to anger, frustration or provocation.
Offences that comprised features of both instrumental and reactive violence were classified as *instrumental-reactive* if the primary quality of the violence was instrumental or *reactive-instrumental* if the primary quality of the violence was reactive.

Offences in which there was insufficient information to determine a motivational category were coded as *inadequate information to code*.

*Other characteristics of the index offence.* The index offence was also examined to obtain information about whether the adolescent perpetrated the offence alone, or if she was with accomplices, and whether the adolescent was intoxicated with alcohol or substances at the time of the offence.

*Victim characteristics.* In addition, the victim-offender relationship, victim sex and victim age were recorded. The victim-offender relationship was collapsed into two categories: family victims or community victims. Victim age was also recorded dichotomously as child/youth aged victims or adult victims.

*Severity of violence.* The severity of violence of the adolescent’s index offence was measured using the *Violence Assessment Scheme* (VAS; Alia-Klein et al., 2007), which has been used in similar studies of violence (e.g., Douglas, 2010). The VAS was designed to rate the severity of other-directed aggressive acts and captures acts which range from mild, non-physical aggression through to extreme acts of violence. The scale ranges from 0 to 100, with anchor points at 10-point intervals that include descriptions of acts that escalate in violence severity. The descriptions include examples of specific acts, the amount of injury/damage and the use of weapons. The current version of the VAS has been reported to have inter-rater reliability of .98 (interclass correlation). The VAS also correlates significantly with the Modified Overt Aggression Scale and a previous version of the VAS was validated with the MacArthur Community Violence instrument, with between-scale agreement ranging from .52 to .89, demonstrating the concurrent validity of this measure (Alia-Klein et al., 2007). See Appendix D for a copy of the VAS.

*The Trauma Symptom Checklist* (Briere, 1996). The TSCC was administered to youth at the time of assessment. These results were taken directly from the files and entered into the data spreadsheet.

The TSCC is a 54-item self-report measure of posttraumatic stress and related psychological symptomatology. It is administered to children ranging in age from 8 to 17 who have experienced traumatic events (e.g., major loss, natural disaster, witnessing trauma to others, maltreatment, peer victimisation). The TSCC was developed to evaluate an individual’s responses to unspecified traumatic events across a variety of symptom domains, and measures
not only posttraumatic stress, but includes other symptom clusters sometimes found in traumatised children.

The TSCC includes two validity scales: Under-response (UND), which reflects a tendency towards denial of symptoms, and Hyper-response (HYP), which reflects a tendency to overrespond to the items, or a state of being overwhelmed by traumatic stress.

It also consists of six clinical scales:

1. Anxiety scale (ANX): nine items developed to measure hyperarousal, fears and generalised anxiety.
2. Depression scale (DEP): ten items that assess depressive cognitions.
3. Anger scale (ANG): nine items designed to assess experiences of angry thoughts, feelings and behaviours.
4. Posttraumatic Stress scale (PTS): ten items designed to query each of the PTSD symptom areas (re-experiencing, avoidance and hyperarousal). It must be noted that there is a heavier focus on re-experiencing symptoms.
5. Dissociation scale (DIS): ten items designed to measure experiences of dissociation symptomatology. This scale comprises two subscales: Overt Dissociation subscale (DIS-O): seven items which measure experiences of derealisation, dissociative avoidance and emotional numbing, and Fantasy Dissociation subscale (DIS-F): three items which measure the propensity to fantasize, pretend and daydream.
6. Sexual Concerns scale (SC) - ten items measuring sexual distress and preoccupation. This scale comprises two subscales: Sexual Preoccupation subscale (SC-P) - seven items which assess sexual thoughts, feelings and behaviours (that are rare for children of a given age group), and Sexual Distress subscale (SC-D): four items designed to measure sexual conflicts, fears and unwanted sexual responses.

The TSCC is presented as a list of thoughts, feelings and behaviours, young people are asked to rate what degree they experience or agree with each item in a 4-point Likert format which ranges from “never” to “almost all the time”. The TSCC yields a continuous raw score for each of the scales. These raw scores are transformed into T-scores on profile forms for gender and age group, with higher scores indicative of higher levels of trauma symptoms. For all scales, with the exception of the sexual concerns scale and subscales, T-scores of 60 and over constitute subclinical symptom severity and scores of 65 or over constitute clinical severity. For the sexual concerns scale and subscales, T scores of 65 or over and 70 or over constitute subclinical and clinical severity respectively.
Normative comparisons for the TSCC were generated from a US non-clinical sample of 3,008 children (53% females), with ages ranging from 8 to 16. The TSCC scales have demonstrated both concurrent and discriminant validity (Briere, 1996).

The TSCC has demonstrated reliability, with internal consistency coefficients for the six clinical scales ranging from .77 to .82, and for the four clinical subscales ranging from .58 to .64 (Briere, 1996). The UND and HYP validity scales had coefficients of .85 and .66 respectively.

**Procedure**

**Ethical Issues**

Permission to access client files was received from RYFS and institutional approval was granted by the Auckland District Health Board Research Review Committee. Access to the files was conditional on the researcher signing and abiding by the confidentiality agreement as set out by the Auckland District Health Board. This required that the researcher ensure anonymity within the written results. Ethical approval was also sought from the Northern X Regional Ethics Committee (see Appendix E).

Files were reviewed by two researchers (the principal researcher and a trained graduate research assistant) at RYFS’s premises in Auckland. Information contained in these files had been collected by RYFS clinicians during the course of clinical assessments and treatment. The duration to review each file ranged between 40 and 120 minutes.

A client information sheet (as described above) was used to record the data extracted from the files. This was used alongside the coding manual, which defined how each variable was to be coded. Inter-rater reliability was calculated for all variables that were deemed to be subjective and based upon the raters’ interpretation of the file information. It was not calculated for variables that were evident in the file such as age at time of referral and ethnicity for example.

**Data Analysis**

Data obtained from the files was entered into IBM SPSS version 20. Continuous demographic data variables from the CIS and the psychometrics were entered. Discrete data variables (e.g., offence type, ethnicity) were coded and entered into SPSS. Each client was allocated a subject number and only identified by this number within SPSS. Data was checked for errors and the necessary corrections made.

Preliminary descriptive statistics were generated to check the assumptions underlying the use of parametric and nonparametric research methods. Homogeneity of variance and normality
were reported for variables which underwent parametric testing. An alpha of 0.05 was used for all statistical tests.

Some clinical files had missing data for variables of interest. The results reported are based on the cases for which any given variable was recorded as either present or absent (or evidence or no evidence) and missing data was excluded from the analysis.

The first aim of this thesis was:

(1) To describe the sample of female youth in terms of their demographic, psychosocial (historical background and diagnoses) and offending backgrounds, and identify any factors that distinguish the youth with violent offences from those who had nonviolent offence histories.

In order to address this aim, data were analysed to establish if youth who had committed violent offences differed from youth who had committed nonviolent offences. Chi square analyses were used to determine whether or not the clients in each of the violent and nonviolent groups varied significantly from each other on demographic and psychosocial variables. Fisher’s exact test (2 x 2 chi square) was used when a chi square analysis had an expected cell count of less than 5.

For the continuous variables, independent t-tests were used to determine group differences, and for the variables that did not meet the assumptions of parametric testing, the non-parametric Mann–Whitney U test was conducted to determine group differences.

The next aims included:

(2) To investigate the demographic, psychosocial (historical background and diagnoses) and offence-related correlates of instrumental and reactive aggression in a sample of female youth who perpetrated a violent offence.

(3) To investigate the demographic, psychosocial (historical background and diagnoses) and offence-related correlates of youth who perpetrate violence against their family members and youth that perpetrate violence in the community.

(4) To investigate the demographic, psychosocial (historical background and diagnoses) and offence-related correlates of violent Māori and Pākehā female youth.

Each of these aims was investigated separately, via the same methodology. The variables of interest were used as predictors in logistic regression analyses, to predict the three sets of
outcome variables: (1) motivational subtype of violence (instrumental or reactive), (2) victim subtype (family or community), and (3) ethnicity (Māori or Pākehā).

The predictor variables were grouped into four areas: (1) demographic variables, (2) offence related variables, (3) TSCC scores, and (4) background psychosocial variables. For each of the three sets of outcome variables (violence motivation, victim subtype, and ethnicity), logistic regression analyses were conducted for each of the four areas. Chi square analyses were also used to provide supplementary information about differences between the groups.

Given the large number of variables included in the “background psychosocial variables” category, this was further broken down into subdomains (mental health variables, substance use variables, family variables, school variables, maltreatment variables, peer and other problem behaviour variables and developmental background variables), and separate logistic regression analyses determined which variables would be selected for a final combined model. This process is explained in more detail throughout the results section.
CHAPTER THREE: RESULTS

Overview

The first section of the results will report the integrity of the data by presenting inter-rater reliability. The data were also subjected to assumptions testing for the specific analyses to be used, and the results of this testing are presented in this section.

Section Two will compare the group of violent female youth \( n = 106 \) to their nonviolent counterparts \( n = 78 \) to investigate if the groups are significantly different on any of the variable groupings of interest (demographic variables, psychosocial variables, offending related variables and TSCC scores).

Section Three will present further descriptive statistics relating to the violent group of youth which will outline details of their index violent offence. This will include their motivational subtype of violence (reactive or instrumental), severity of violence in their offence, and details of their victim (family victim versus community victim, victim age, victim sex).

In Section Four, the relationships between potential predictor variables and the first outcome variable (motivational subtype of violence) are examined via a series of logistic regression analyses. These are conducted in four areas, (1) demographic variables, (2) background psychosocial variables (which include mental health variables, substance use variables, family variables, school variables, maltreatment variables, peer and other problem behaviour variables and developmental background variables), (3) offence related characteristics, and (4) TSCC scores. Due to the large number of background psychosocial variables, they are first investigated in separate domains (as listed) to identify potentially predictive variables and these variables are then entered into one combined model.

In Section Five, the relationships between potential predictor variables and the second outcome variable (victim subtype) are examined via the same method as described for Section Four. These analyses examined whether youth classified into groups dependent on their targeted victim (family member or community member) differed in terms of their demographic characteristics, psychosocial background, offence characteristics and TSCC scores.

In Section Six, the relationships between potential predictor variables and the third outcome variable (ethnicity) are examined via the same method as described for Section Four. These analyses examined whether youth classified into groups dependent on their ethnicity (Māori or Pākehā) differed in terms of their demographic characteristics, psychosocial background, offence characteristics and TSCC scores.
As not all measures or data were available for each offender, there is some variability across sample sizes for the analyses which will be noted throughout.

Section One: Inter-rater Reliability and Assumptions Testing

Inter-rater Reliability
Information extracted and coded from clinical files provided much of the data for analysis in the present study. Data was collected by two researchers, the principal researcher and a trained graduate research assistant.

For the categorical variables, inter-rater reliability between the principal researcher’s data and the second researcher’s data was assessed using Cohen’s Kappa ($k$), which measures the strength and significance of agreement between the researchers. To assess the reliability of this information, inter-rater reliability was calculated on all of the variables used in the analysis for approximately 10% of the overall sample. Using reliability values proposed by Cicchetti et al. (2006), an inter-rater agreement of “fair” (0.40–0.59) was achieved for 6% of the categorical variables, an inter-rater agreement of “good” (0.60–0.74) was achieved for 2% of the categorical variables and an inter-rater agreement of “excellent” (≥0.75) was achieved for 92% of the categorical variables. Inter-rater reliability is presented in Appendix F.

To measure inter-rater reliability for the continuous variables, the intraclass correlation coefficient (ICC) was used. The ICC provides a measure of the consistency of measurements made by two or more raters measuring the same factor (Shrout & Fleiss, 1979). ICC was calculated using a two-way mixed effects model with absolute agreement approach ($n = 30$).

For the VAS scores, the mean of rater one was 63.57 ($SD = 11.42$) and the mean of rater two was 63.43 ($SD = 9.74$), which shows a similar distribution. The single measures ICC was .96 ($p < .001$). The mean difference in the raters’ scores was 0.13 and was not significantly different ($t = .24$, $df = 29$, $p = .81$). The correlation between the two rater’s scores was .97, which also indicates strong agreement.

For the variable age when problem behaviours began ($n = 20$), the mean of rater one was 9.90 ($SD = 3.64$), and the mean of rater two was 9.50 ($SD = 3.54$), which shows a similar distribution. The single measures ICC was .94, ($p < .001$). The mean difference in the raters’ scores was 0.40, and was not significantly different ($t = 1.45$, $df = 19$, $p = .16$). The correlation between the two rater’s scores was .94, which also indicates strong agreement.

ICC was not calculated for variables that were clearly stated in the files (e.g., age at referral), and transferred to the database. Age when problem behaviours began and VAS scores...
were subjective and determined by the research assistants after reading each file in its entirety. For this reason ICC was calculated for these variables.

**Testing the Assumptions for the Use of Independent t-tests**

In order for an independent t-test to be accurate, four assumptions are required to be met (normal distribution, homogeneity of variance, interval level data and independence of data). All continuous variables were confirmed as interval level and independent. The following procedures as described by Field (2009) were conducted to assess if the continuous variables were normally distributed and met assumptions for homogeneity of variance.

**Normally distributed data.** Histograms were generated for the continuous variables of interest and revealed skewed non-normal distributions for majority of the variables. Descriptive statistics were generated to obtain data on skewness and kurtosis to assess the degree and significance of non-normal distributions. For each variable, values of skewness and kurtosis were converted into z-scores. The z-score values were used to assess the probability of deviation from a normal distribution having occurred by chance. The z-scores of skewness and kurtosis are displayed in Table 2.

The majority of the TSCC variables were significantly positively skewed. Positively skewed data is not unexpected in clinical populations where data are derived from questionnaires designed to assess the extent of psychopathology, such as the TSCC (van den Oord, Pickles, & Waldman, 2003). In syndrome data, this non-normal distribution is explained by the fact that the majority of individuals display limited or no syndromes, data transformation is often inadequate to correct for this non-normality (van den Oord et al.). For this reason, this study has employed a non-parametric alternative (the Mann–Whitney U test) to analyse differences between groups on the TSCC data.
Table 2

Skewness and Kurtosis Values for the Continuous Variables

<table>
<thead>
<tr>
<th>Continuous variables</th>
<th>z-score of skewness</th>
<th>z-score of kurtosis</th>
<th>Normally distributed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at referral</td>
<td>0.23</td>
<td>-1.28</td>
<td>Yes</td>
</tr>
<tr>
<td>Age when problem behaviours began</td>
<td>-4.84***</td>
<td>0.89</td>
<td>No</td>
</tr>
<tr>
<td>VAS scores</td>
<td>4.08***</td>
<td>7.94***</td>
<td>No</td>
</tr>
<tr>
<td>Total abuse types</td>
<td>-0.08</td>
<td>-1.66</td>
<td>Yes</td>
</tr>
<tr>
<td>Total substance use types</td>
<td>1.71</td>
<td>-1.83</td>
<td>Yes</td>
</tr>
<tr>
<td>Total MH problems</td>
<td>1.56</td>
<td>-0.46</td>
<td>Yes</td>
</tr>
<tr>
<td>TSCC scales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.34</td>
<td>-1.49</td>
<td>Yes</td>
</tr>
<tr>
<td>Depression</td>
<td>4.05**</td>
<td>2.48*</td>
<td>No</td>
</tr>
<tr>
<td>Anger</td>
<td>2.1*</td>
<td>0.11</td>
<td>No</td>
</tr>
<tr>
<td>Post-traumatic stress</td>
<td>1.3</td>
<td>-1.46</td>
<td>Yes</td>
</tr>
<tr>
<td>Dissociation</td>
<td>2.51*</td>
<td>0.76</td>
<td>No</td>
</tr>
<tr>
<td>Dissociation – overt</td>
<td>2.41*</td>
<td>0.8</td>
<td>No</td>
</tr>
<tr>
<td>Dissociation – fantasy</td>
<td>2.53*</td>
<td>0.24</td>
<td>No</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>5.03***</td>
<td>4.43***</td>
<td>No</td>
</tr>
<tr>
<td>Sexual concerns – preoccupation</td>
<td>5.12***</td>
<td>4.38***</td>
<td>No</td>
</tr>
<tr>
<td>Sexual concerns – distress</td>
<td>6.78***</td>
<td>6.24***</td>
<td>No</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01, ***p < .001 (above 1.96, 2.58, 3.29).

Homogeneity of variance. This refers to the assumption that the spread of scores is approximately equal in different groups of cases (Field, 2009). The variables that met the assumptions for normality (age at time of referral, total abuse types, total mental health problems and total substance use types) were tested for homogeneity of variance. The variables that did not meet the assumption of normality did not need to be tested as they had already violated the assumptions for parametric testing, and thus would be subject to non-parametric testing. Although two of the TSCC scales did have a normal distribution, they were also subjected to non-parametric methods of analysis for simplicity and uniformity.

Levene’s test was used to test the assumption of homogeneity of variance across the violent and nonviolent groups of youth. The following four variables: age at time of referral, total abuse types, total mental health problems and total substance use types all yielded non-significant p-values ($p > .05$), which indicated that homogeneity of variance could be assumed. The results of the Levene’s test are displayed in Table 3.
Table 3

**Levene’s Test for Homogeneity of Variance Across the Violent and Nonviolent Groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Levene’s statistic</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at referral</td>
<td>0.41</td>
<td>0.52</td>
</tr>
<tr>
<td>Total types of abuse</td>
<td>2.47</td>
<td>0.12</td>
</tr>
<tr>
<td>Total MH problems</td>
<td>0.73</td>
<td>0.39</td>
</tr>
<tr>
<td>Total drug use types</td>
<td>0.05</td>
<td>0.83</td>
</tr>
</tbody>
</table>

**Testing the Assumptions for Logistic Regression Analyses**

**Linearity of the logit.** The assumption of linearity in logistic regression assumes that there is a linear relationship between any continuous predictors and the logit of the outcome variable. This assumption was tested by the method described in Field (2009), by observing whether the interaction term between the predictor and the log transformation of the same predictor was significant in a logistic regression. The main effect of the variable was also included as a covariate in the model. This was varied out for each predictor. This procedure was carried out three times, firstly with the dependent variable as violence subtype, secondly with the dependent variable as victim subtype and lastly with the dependent variable as ethnicity. P-values greater than .05 indicated that the assumption of linearity of the logit had been met. The results of this testing are displayed in Table 4. Majority of the interactions had significance values greater than .05, which indicated that the assumption of linearity of the logit had been met.

The one exception was for the VAS scores for violence subtype, thus the Mann–Whitney U test was used to test if there were significant differences between the outcome variables, and it was therefore not used in the logistic regression analyses.
Table 4

Testing the Linearity of the Logit Assumption for the Three Sets of Outcome Variables: Violence Subtype, Victim Subtype and Ethnicity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Violence subtype</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Likelihood ratio $\chi^2$</td>
<td>$p$</td>
</tr>
<tr>
<td>Age at referral</td>
<td>0.25</td>
<td>0.62</td>
</tr>
<tr>
<td>SED score</td>
<td>0.02</td>
<td>0.90</td>
</tr>
<tr>
<td>VAS</td>
<td>6.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Total number of abuse types*</td>
<td>4.78</td>
<td>0.08</td>
</tr>
<tr>
<td>Total number of MH problems*</td>
<td>1.88</td>
<td>0.17</td>
</tr>
<tr>
<td>Total types of drugs used*</td>
<td>0.36</td>
<td>0.55</td>
</tr>
<tr>
<td>Age problem behaviours began</td>
<td>0.06</td>
<td>0.81</td>
</tr>
<tr>
<td>TSCC scales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>0.17</td>
<td>0.68</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.09</td>
<td>0.77</td>
</tr>
<tr>
<td>Anger</td>
<td>2.50</td>
<td>0.11</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>2.45</td>
<td>0.12</td>
</tr>
<tr>
<td>Dissociation</td>
<td>3.04</td>
<td>0.08</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>0.01</td>
<td>0.92</td>
</tr>
<tr>
<td>Victim type</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Likelihood ratio $\chi^2$</td>
<td>$p$</td>
</tr>
<tr>
<td>Age at referral</td>
<td>1.51</td>
<td>0.22</td>
</tr>
<tr>
<td>SED score</td>
<td>0.14</td>
<td>0.71</td>
</tr>
<tr>
<td>VAS</td>
<td>0.06</td>
<td>0.81</td>
</tr>
<tr>
<td>Total number of abuse types*</td>
<td>3.21</td>
<td>0.07</td>
</tr>
<tr>
<td>Total number of MH problems*</td>
<td>0.08</td>
<td>0.77</td>
</tr>
<tr>
<td>Total types of drugs used*</td>
<td>0.07</td>
<td>0.79</td>
</tr>
<tr>
<td>Age problem behaviours began</td>
<td>0.23</td>
<td>0.63</td>
</tr>
<tr>
<td>TSCC scales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>0.08</td>
<td>0.78</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.02</td>
<td>0.88</td>
</tr>
<tr>
<td>Anger</td>
<td>0.11</td>
<td>0.74</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>0.51</td>
<td>0.48</td>
</tr>
<tr>
<td>Dissociation</td>
<td>3.65</td>
<td>0.08</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>0.02</td>
<td>0.89</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Likelihood ratio $\chi^2$</td>
<td>$p$</td>
</tr>
<tr>
<td>Age at referral</td>
<td>0.07</td>
<td>0.79</td>
</tr>
<tr>
<td>SED score</td>
<td>0.04</td>
<td>0.84</td>
</tr>
<tr>
<td>VAS</td>
<td>0.98</td>
<td>0.32</td>
</tr>
<tr>
<td>Total number of abuse types*</td>
<td>0.02</td>
<td>0.89</td>
</tr>
<tr>
<td>Total number of MH problems*</td>
<td>0.19</td>
<td>0.67</td>
</tr>
<tr>
<td>Total types of drugs used*</td>
<td>0.04</td>
<td>0.84</td>
</tr>
<tr>
<td>Age problem behaviours began</td>
<td>2.11</td>
<td>0.15</td>
</tr>
<tr>
<td>TSCC scales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>0.04</td>
<td>0.85</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.85</td>
<td>0.36</td>
</tr>
<tr>
<td>Anger</td>
<td>1.46</td>
<td>0.23</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>0.16</td>
<td>0.69</td>
</tr>
<tr>
<td>Dissociation</td>
<td>0.00</td>
<td>0.97</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>1.61</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Note. Degrees of freedom for each test was 1.
*Those cases that were coded with a score of zero (e.g., had no mental health problems) (and so for which the natural log could not be computed) were excluded from the analysis. Hence this test is effectively testing whether the relationship between the predictor variable and the outcome is linear for the portion of the predictor variable that is greater than zero.

**Independence of errors.** This means that the cases of data should not be related (for example, measures of the same people at different time points). This assumption was met as data were not related in this study.

**Multicollinearity.** When conducting logistic regression, it is essential to check for collinearity. This means that the predictor variables should not be too highly correlated (Field, 2009). There are a number of ways to check for collinearity, this study used the method outlined by Field (2009). To assess collinearity amongst the variables, variance inflation factors (VIF) and tolerance values were generated for each model. Mernard (1995) suggests that a tolerance value less than 0.1 is indicative of a serious collinearity problem. Myers (1990) suggests that VIF values greater than 10 are a concern. VIF and tolerance values are presented for each logistic regression model in the corresponding tables, and indicate that there were no problems with collinearity in any of the analyses. VIF and tolerance were only calculated when there was more than one variable in a regression analysis.

**Section Two: Violent and Nonviolent Female Youth**

Offenders across the entire sample (*n* = 184) had a mean age at time of referral of 15.5 (*SD* = 0.81), and ranged in age from 13.4 to 17.3.

Māori were over-represented in the sample, comprising 60% (111), Pākehā comprised 27% (50) of the sample, Pacific Island youth represented 7% (13), and 3% (6) of the sample were made up of “other” ethnic groups. Information about ethnicity was unavailable for 2% (4) of the sample.

The following section will compare youth with violent charges (*n* = 106) to youth with nonviolent charges (*n* = 78).

**Demographic Background**

**Age at referral.** The mean age at referral for the violent sample of youth was 15.44 (*SD* = 0.83), compared to 15.65 (*SD* = 0.78) for the nonviolent sample, which was not significantly different, *t* (182) = 1.78, *p* = .08.

**Ethnicity.** Table 5 presents the ethnic breakdown of the violent and nonviolent samples. To test whether the overall distribution in ethnic groups is different between the violent and nonviolent groups, a Fisher’s exact test was used. The Fisher’s exact test is utilised when a chi square analysis is required, but one or more of the cells have an expected frequency count of five
or less (Field, 2009). Unless you have the SPSS Exact Test Module, SPSS only produces the Fisher’s exact test on a 2 x 2 table. Therefore this analysis was performed in R (Version 2.14.1) with the function “fisher.test”. This produced a p-value of .35, which indicated that the distribution of ethnic groups across the violent and nonviolent samples was not significantly different.

Table 5

*Ethnic Breakdown of the Violent and Nonviolent Samples*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Violent (n, %)</th>
<th>Nonviolent (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Māori</td>
<td>68 (64.2)</td>
<td>43 (55.1)</td>
</tr>
<tr>
<td>Pākehā</td>
<td>28 (26.4)</td>
<td>22 (28.2)</td>
</tr>
<tr>
<td>Pacific Island</td>
<td>5 (4.7)</td>
<td>8 (10.3)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (3.8)</td>
<td>2 (2.6)</td>
</tr>
<tr>
<td>Unknown</td>
<td>1 (0.9)</td>
<td>3 (3.8)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>106 (100)</strong></td>
<td><strong>78 (100)</strong></td>
</tr>
</tbody>
</table>

**Socioeconomic deprivation.** Table 6 presents the socioeconomic deprivation index scores across the samples of violent and nonviolent youth. Of the violent youth, 65% lived in 50% of the most deprived areas of NZ, as did 69% of the nonviolent youth.

Table 6

*Socioeconomic Deprivation Index Scores for the Violent and Nonviolent Samples of Youth*

<table>
<thead>
<tr>
<th>Socioeconomic deprivation index</th>
<th>Violent (n, %)</th>
<th>Nonviolent (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (1.9)</td>
<td>2 (2.6)</td>
</tr>
<tr>
<td>2</td>
<td>14 (13.2)</td>
<td>7 (9)</td>
</tr>
<tr>
<td>3</td>
<td>5 (4.7)</td>
<td>6 (7.7)</td>
</tr>
<tr>
<td>4</td>
<td>6 (5.7)</td>
<td>5 (6.4)</td>
</tr>
<tr>
<td>5</td>
<td>10 (9.4)</td>
<td>4 (5.1)</td>
</tr>
<tr>
<td>6</td>
<td>9 (8.5)</td>
<td>6 (7.7)</td>
</tr>
<tr>
<td>7</td>
<td>9 (8.5)</td>
<td>8 (10.3)</td>
</tr>
<tr>
<td>8</td>
<td>10 (9.4)</td>
<td>8 (10.3)</td>
</tr>
<tr>
<td>9</td>
<td>20 (18.9)</td>
<td>9 (11.4)</td>
</tr>
<tr>
<td>10</td>
<td>21 (19.8)</td>
<td>23 (29.5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>106 (100)</strong></td>
<td><strong>78 (100)</strong></td>
</tr>
</tbody>
</table>

*Note.* A score of 10 indicates that these youth live in the most deprived 10% of areas in NZ.

**Psychosocial background variables**
**Mental health history.** Of the violent female youth, 76% had been diagnosed with a mental health disorder at some point in their lives. This rate was not significantly different when compared to the nonviolent youth (68%), $\chi^2 (1, N = 184) = 1.27, p = .26$.

The mean number of total mental health diagnoses for the violent sample of youth was 1.52 ($SD = 1.28$), compared to 1.27 ($SD = 1.20$) for the nonviolent sample, which was not significantly different, $t (182) = -1.34, p = .18$.

The prevalence of specific mental health diagnoses for both the violent and nonviolent samples is presented in Table 7. As can be seen in the table, the prevalence of mental health diagnoses was comparable for both the violent and nonviolent samples across most of the diagnostic categories. ADHD and substance use disorders were more prevalent in the violent sample compared to the nonviolent sample, with these differences demonstrating a trend towards significance.

Given the small numbers of clients with evidence of Bipolar Disorder and Eating Disorder, they were not included in the logistic regression analyses in the following sections.

Table 7

<p>|Mental Health Variables Across Violent (n = 106) and Nonviolent (n = 78) Samples|</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Violent (n, %)</th>
<th>Nonviolent (n, %)</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD and/or ODD</td>
<td>48 (45.3)</td>
<td>30 (38.5)</td>
<td>0.86</td>
<td>0.36</td>
</tr>
<tr>
<td>ADHD</td>
<td>17 (16)</td>
<td>6 (7.7)</td>
<td>2.86</td>
<td>0.09</td>
</tr>
<tr>
<td>Depression</td>
<td>20 (18.9)</td>
<td>19 (24.4)</td>
<td>0.81</td>
<td>0.37</td>
</tr>
<tr>
<td>Anxiety</td>
<td>8 (7.5)</td>
<td>7 (9)</td>
<td>0.12</td>
<td>0.73</td>
</tr>
<tr>
<td>PTSD</td>
<td>15 (14.2)</td>
<td>11 (14.1)</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>Eating disorder</td>
<td>3 (2.8)</td>
<td>2 (2.6)</td>
<td>–</td>
<td>1.00*</td>
</tr>
<tr>
<td>Bipolar</td>
<td>3 (2.8)</td>
<td>0 (0)</td>
<td>–</td>
<td>0.26*</td>
</tr>
<tr>
<td>Substance use disorder</td>
<td>39 (36.8)</td>
<td>19 (24.4)</td>
<td>3.22</td>
<td>0.07</td>
</tr>
<tr>
<td>Psychotic disorder/prodrome</td>
<td>10 (9.5)</td>
<td>5 (6.4)</td>
<td>0.54</td>
<td>0.46</td>
</tr>
<tr>
<td>Deliberate self-harm</td>
<td>66 (62.3)</td>
<td>48 (61.5)</td>
<td>0.01</td>
<td>0.92</td>
</tr>
</tbody>
</table>

*Note. * Fishers exact test used.

**Substance use.** Rates of specific types of drug use are presented in Table 8. As can be seen in the table, violent and nonviolent youth did not differ significantly in their rates of drug use. Overall, almost 90% of youth had a history of using cannabis, and around 35% had used stimulant type drugs. Approximately 30% had used other drugs (e.g., hallucinogens, inhalants). Only one youth in the entire sample had evidence of opiate use.
In regards to the total number of types of drug used, the violent group ($M = 1.52$, $SD = 0.92$) and the nonviolent group ($M = 1.50$, $SD = 0.92$) were not significantly different, $t(182) = 0.47$, $p = .64$.

Table 8

History of Drug Use Across the Violent ($n=106$) and Nonviolent ($n=78$) Samples

<table>
<thead>
<tr>
<th>History of drug use</th>
<th>Violent ($n$, %)</th>
<th>Nonviolent ($n$, %)</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabis</td>
<td>92 (86.8)</td>
<td>69 (88.5)</td>
<td>0.11</td>
<td>0.74</td>
</tr>
<tr>
<td>Opiate</td>
<td>0 (0)</td>
<td>1 (1.3)</td>
<td>–</td>
<td>1.00*</td>
</tr>
<tr>
<td>Stimulants</td>
<td>36 (34)</td>
<td>30 (38.5)</td>
<td>0.40</td>
<td>0.53</td>
</tr>
<tr>
<td>Other drugs</td>
<td>29 (27.4)</td>
<td>26 (33.3)</td>
<td>0.77</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Note. * Fishers exact test used.

Maltreatment history. Of the violent sample, 90% had experienced at least one form of maltreatment, and this rate was identical for the nonviolent sample (90%). For the violent sample, the mean total number of types of maltreatment experienced was 2.5 ($SD = 1.40$), and this was similar for the nonviolent sample which had a mean of 2.6 ($SD = 1.60$), $t(182) = 0.48$, $p = .63$.

Table 9 displays the rates of specific forms of maltreatment across the samples of violent and nonviolent youth. As can be seen in Table 9, the rates across both samples are comparable for all of the maltreatment variables except for emotional abuse. Emotional abuse was significantly more prevalent in the nonviolent group of youth.

Table 9

History of Maltreatment Across the Violent ($n=106$) and Nonviolent ($n=78$) Samples

<table>
<thead>
<tr>
<th>Variable</th>
<th>Violent ($n$, %)</th>
<th>Nonviolent ($n$, %)</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Witness violence</td>
<td>62 (58.5)</td>
<td>45 (57.7)</td>
<td>0.01</td>
<td>0.91</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>71 (67)</td>
<td>48 (61.5)</td>
<td>0.58</td>
<td>0.45</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>57 (53.8)</td>
<td>45 (57.7)</td>
<td>0.28</td>
<td>0.60</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>35 (33)</td>
<td>37 (47.4)</td>
<td>3.92</td>
<td>0.05</td>
</tr>
<tr>
<td>Neglect</td>
<td>42 (39.6)</td>
<td>35 (44.9)</td>
<td>0.51</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Family variables. Table 10 displays the prevalence of specific family background variables across the violent and nonviolent groups.
As can be seen in the table, violent youth were significantly less likely than the nonviolent youth to have had at least one family member with a mental health diagnosis. Violent offenders were more likely to have had a parent incarcerated, with this difference approaching significance.

Table 10

Family Variables Across the Violent (n = 106) and Nonviolent (n = 78) Samples

<table>
<thead>
<tr>
<th>Variable</th>
<th>Violent (n, %)</th>
<th>Nonviolent (n, %)</th>
<th>χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health problems in family</td>
<td>36 (34)</td>
<td>44 (56.4)</td>
<td>9.21</td>
<td>0.002</td>
</tr>
<tr>
<td>CYF care history</td>
<td>60 (56.6)</td>
<td>43 (55.1)</td>
<td>0.06</td>
<td>0.84</td>
</tr>
<tr>
<td>Parent criminality</td>
<td>41 (38.7)</td>
<td>26 (33.3)</td>
<td>0.56</td>
<td>0.46</td>
</tr>
<tr>
<td>Parental incarceration</td>
<td>24 (22.6)</td>
<td>10 (12.8)</td>
<td>2.88</td>
<td>0.09</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td>23 (21.7)</td>
<td>17 (21.8)</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>Parental drug use</td>
<td>44 (41.5)</td>
<td>25 (32.1)</td>
<td>1.72</td>
<td>0.19</td>
</tr>
<tr>
<td>Parental alcohol abuse</td>
<td>50 (47.1)</td>
<td>35 (44.8)</td>
<td>0.14</td>
<td>0.71</td>
</tr>
<tr>
<td>Parent status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated/at least one parent deceased</td>
<td>80 (75.5)</td>
<td>65 (83.3)</td>
<td>1.66</td>
<td>0.20</td>
</tr>
<tr>
<td>Together/married</td>
<td>26 (24.5)</td>
<td>13 (16.7)</td>
<td>1.66</td>
<td>0.20</td>
</tr>
<tr>
<td>Mother contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None or minimal</td>
<td>10 (9.9)</td>
<td>5 (6.5)</td>
<td>0.66</td>
<td>0.42</td>
</tr>
<tr>
<td>Some or close</td>
<td>91 (90.1)</td>
<td>72 (93.5)</td>
<td>0.66</td>
<td>0.42</td>
</tr>
<tr>
<td>Father contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None or minimal</td>
<td>39 (37.9)</td>
<td>29 (38.2)</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Some or close</td>
<td>64 (62.1)</td>
<td>47 (61.8)</td>
<td>0.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Developmental and school/peer background variables.** As can be seen in Table 11, there were no significant differences between the violent and nonviolent groups on any of the variables. However, the variable bullied indicated a trend toward significance, with the youth in the nonviolent group more likely to have a history of being bullied.
Table 11

*Developmental and School/Peer Background Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Violent (n, %)</th>
<th>Nonviolent (n, %)</th>
<th>χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy stress</td>
<td>29 (27.4)</td>
<td>21 (26.9)</td>
<td>0.00</td>
<td>0.95</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>19 (17.9)</td>
<td>18 (23.1)</td>
<td>0.74</td>
<td>0.39</td>
</tr>
<tr>
<td>Grief/bereavement issues</td>
<td>14 (13.2)</td>
<td>5 (6.4)</td>
<td>2.24</td>
<td>0.13</td>
</tr>
<tr>
<td>Anger problems</td>
<td>71 (67)</td>
<td>44 (56.4)</td>
<td>2.14</td>
<td>0.14</td>
</tr>
<tr>
<td>ADHD type symptoms</td>
<td>34 (32.1)</td>
<td>20 (25.6)</td>
<td>0.90</td>
<td>0.34</td>
</tr>
<tr>
<td>Low intellect /cog impairment</td>
<td>19 (17.9)</td>
<td>8 (10.3)</td>
<td>2.11</td>
<td>0.15</td>
</tr>
<tr>
<td>School learning problems</td>
<td>34 (32.1)</td>
<td>22 (28.2)</td>
<td>0.32</td>
<td>0.57</td>
</tr>
<tr>
<td>School behaviour problems</td>
<td>96 (90.6)</td>
<td>70 (89.7)</td>
<td>0.03</td>
<td>0.85</td>
</tr>
<tr>
<td>Expulsions/suspensions</td>
<td>57 (53.8)</td>
<td>35 (44.9)</td>
<td>1.42</td>
<td>0.23</td>
</tr>
<tr>
<td>Truancy</td>
<td>79 (74.5)</td>
<td>54 (69.2)</td>
<td>0.63</td>
<td>0.43</td>
</tr>
<tr>
<td>Bullied</td>
<td>26 (24.5)</td>
<td>28 (35.9)</td>
<td>2.80</td>
<td>0.09</td>
</tr>
<tr>
<td>Bully</td>
<td>29 (27.4)</td>
<td>17 (21.8)</td>
<td>0.74</td>
<td>0.39</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>22 (20.8)</td>
<td>11 (14.1)</td>
<td>1.35</td>
<td>0.25</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>38 (35.8)</td>
<td>31 (39.7)</td>
<td>0.29</td>
<td>0.59</td>
</tr>
<tr>
<td>Prostitution</td>
<td>10 (9.4)</td>
<td>8 (10.3)</td>
<td>0.03</td>
<td>0.85</td>
</tr>
<tr>
<td>Ran away</td>
<td>66 (55.9)</td>
<td>52 (44.1)</td>
<td>0.38</td>
<td>0.54</td>
</tr>
<tr>
<td>Pregnant</td>
<td>12 (11.3)</td>
<td>10 (12.8)</td>
<td>0.10</td>
<td>0.76</td>
</tr>
</tbody>
</table>

The variable *age when problem behaviours began* was able to be coded for 75 (96%) of the nonviolent sample and 97 (92%) of the violent sample. The Mann–Whitney *U* test determines whether the medians of a variable differ significantly between two groups. A Mann–Whitney *U* test revealed that the age when problem behaviours began for the violent youth (*Mdn* = 12) did not differ significantly from the nonviolent youth (*Mdn* = 12), *U* = 3584.00, *p* = .87.

**Offending.** The types of offences committed by the youth across the violent and nonviolent samples are displayed in Table 12. Note that some youth in the nonviolent sample had committed an offence falling under the “violent offences” category, according to the Australian and New Zealand Standard Offence Classification used (e.g., threats of violence or intimidation). However these youth were not included in the “violent sample” as their aggression did not constitute violence according to the definition used for this study.
Trauma Symptom Checklist. TSCC results were available for 63 youth from the violent sample (59%) and for 43 (55%) of the nonviolent youth. Scores for seven youth were eliminated from the data set due to elevated scores that exceeded the cut-off scores for under-responding (70 or greater) and over-responding (90 or over) (Briere, 1996). This left a sample of 61 for the violent group and 38 for the nonviolent group.

Two methods were used to determine if the groups differed on the TSCC. Firstly, to examine if the distribution of scores differed between the groups, Mann–Whitney U tests were used to evaluate if differences existed between the two groups. As can be seen in Table 13, there were no significant differences found.
Table 13

*Mann–Whitney U Tests for the TSCC Subscales for the Violent (n = 61) and Nonviolent (n = 38) Groups*

<table>
<thead>
<tr>
<th>TSCC scales</th>
<th>Violent</th>
<th></th>
<th>Nonviolent</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mdn</td>
<td>Mean rank</td>
<td>Mdn</td>
<td>Mean rank</td>
<td>U</td>
<td>p</td>
</tr>
<tr>
<td>Anxiety</td>
<td>50</td>
<td>51.58</td>
<td>47</td>
<td>47.46</td>
<td>1255.5</td>
<td>0.49</td>
</tr>
<tr>
<td>Depression</td>
<td>47</td>
<td>49.04</td>
<td>48</td>
<td>51.54</td>
<td>1100.5</td>
<td>0.67</td>
</tr>
<tr>
<td>Anger</td>
<td>51</td>
<td>50.81</td>
<td>51</td>
<td>48.70</td>
<td>1208.5</td>
<td>0.72</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>49</td>
<td>51.20</td>
<td>49</td>
<td>48.08</td>
<td>1232.0</td>
<td>0.60</td>
</tr>
<tr>
<td>Dissociation</td>
<td>50</td>
<td>50.62</td>
<td>54</td>
<td>50.31</td>
<td>1197.0</td>
<td>0.96</td>
</tr>
<tr>
<td>Dissociation – overt</td>
<td>52</td>
<td>50.37</td>
<td>52</td>
<td>49.41</td>
<td>1181.5</td>
<td>0.87</td>
</tr>
<tr>
<td>Dissociation – fantasy</td>
<td>52</td>
<td>49.91</td>
<td>47</td>
<td>50.14</td>
<td>1153.5</td>
<td>0.97</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>45</td>
<td>51.25</td>
<td>45</td>
<td>48.00</td>
<td>1235.0</td>
<td>0.58</td>
</tr>
<tr>
<td>Sexual preoccupation</td>
<td>43</td>
<td>51.43</td>
<td>43</td>
<td>47.70</td>
<td>1246.5</td>
<td>0.52</td>
</tr>
<tr>
<td>Sexual distress</td>
<td>53</td>
<td>50.10</td>
<td>41</td>
<td>49.84</td>
<td>1165.0</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Secondly, to explore whether the groups differed in the proportions of youth who scored in the clinically concerning range (borderline or clinical range), chi square tests were carried out. As can be seen in Table 14, there were no significant differences.

Table 14

*Proportions of the Violent (N = 61) and Nonviolent (N = 38) Groups of Youth Scoring in the Borderline or Clinically Concerning Range (BCR) on the TSCC Scales*

<table>
<thead>
<tr>
<th>TSCC scales</th>
<th>Violent BCR (n, %)</th>
<th>Nonviolent BCR (n, %)</th>
<th>χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>14 (22.9)</td>
<td>6 (15.8)</td>
<td>0.64</td>
<td>0.42</td>
</tr>
<tr>
<td>Depression</td>
<td>7 (11.5)</td>
<td>5 (13.1)</td>
<td>–</td>
<td>1.00*</td>
</tr>
<tr>
<td>Anger</td>
<td>13 (21.3)</td>
<td>5 (13.1)</td>
<td>0.69</td>
<td>0.40</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>16 (26.2)</td>
<td>7 (11.5)</td>
<td>0.8</td>
<td>0.37</td>
</tr>
<tr>
<td>Dissociation</td>
<td>14 (22.9)</td>
<td>7 (11.5)</td>
<td>0.29</td>
<td>0.59</td>
</tr>
<tr>
<td>Dissociation – overt</td>
<td>17 (27.9)</td>
<td>8 (21.0)</td>
<td>0.57</td>
<td>0.45</td>
</tr>
<tr>
<td>Dissociation – fantasy</td>
<td>12 (19.7)</td>
<td>10 (26.3)</td>
<td>0.6</td>
<td>0.44</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>11 (18.0)</td>
<td>4 (10.5)</td>
<td>1.03</td>
<td>0.31</td>
</tr>
<tr>
<td>Sexual preoccupation</td>
<td>11 (18.0)</td>
<td>2 (5.27)</td>
<td>–</td>
<td>0.12*</td>
</tr>
<tr>
<td>Sexual distress</td>
<td>6 (9.84)</td>
<td>6 (15.8)</td>
<td>–</td>
<td>0.36*</td>
</tr>
</tbody>
</table>

* Fishers exact test used.
Summary: The Differences between Violent and Nonviolent Female Youth
Overall, very few variables were significantly different in their proportions of violent and nonviolent youth. The only significant differences were for the variables history of mental health problems in family and emotional abuse, with the nonviolent group of youth being more likely to have had these problems in their family when compared to the violent group.

Variables that indicated a trend toward significance ($p < .10$) included the presence of diagnoses such as ADHD or substance use disorder, and a history of parental incarceration, all of which were more prevalent in the violent group of youth compared to the nonviolent group. For the nonviolent group, being a victim of bullying was more likely when compared to the violent group ($p < .10$).

Section Three: The Violent Sample of Youth:
Characteristics of Violence and Victims
This section gives further details about the sample of youth who had been charged with a violent offence ($n = 106$), as further information was collected about the nature of the offence and their victims.

Offending Behaviours
Of the violent sample of youth, 74% (78) had evidence in their file information of also committing a nonviolent offence, whereas 26% had only committed a violent offence (according to available file information).

Types of Violent Offences
The types of violent offences (according to the NZ police codes) are presented in Table 15. The 4 cases in the category intimidation/threats were excluded from the violent sample, as they did not meet the definition for violence employed in the present study.
Table 15

Violent Offence Categories According to the NZ Police Codes

<table>
<thead>
<tr>
<th>Offence category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicide</td>
<td>3</td>
<td>2.73</td>
</tr>
<tr>
<td>Kidnapping and abduction</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Robbery</td>
<td>33</td>
<td>30.00</td>
</tr>
<tr>
<td>Grievous assaults</td>
<td>23</td>
<td>20.91</td>
</tr>
<tr>
<td>Serious assaults</td>
<td>29</td>
<td>26.36</td>
</tr>
<tr>
<td>Minor assaults</td>
<td>18</td>
<td>16.36</td>
</tr>
<tr>
<td>Intimidation/threats</td>
<td>4</td>
<td>3.64</td>
</tr>
<tr>
<td>Group assemblies</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>110</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Motivational Subtype of Violence

All of the index offences had sufficient details to be coded into violence motivation subtype. Of the offences, 58 (55%) were coded as reactive, 1 (1%) was coded as reactive/instrumental, 41 (39%) were coded as instrumental and 6 (6%) were coded as instrumental/reactive. These categories were collapsed into reactive or instrumental due to the small numbers, and for comparison to the literature. This led to 59 cases (56%) being coded as reactive violence and 47 (44%) as instrumental violence.

Offender-Victim Relationship (Victim Subtype)

Victim subtype was able to be coded for 94% of the sample (100 cases). Six cases had insufficient details to code. From the coded index offences, 34 (34%) were coded as family victims, and 66 (66%) were coded as community victims. This dichotomous variable was used for the purpose of the analysis as further breakdown of victim subtype would have resulted in too few numbers in each category. However, Table 16 presents further details of the types of victims.
Table 16

Victims of the Violent Female Youth

<table>
<thead>
<tr>
<th>Victim subtype</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stranger</td>
<td>30</td>
<td>28.3</td>
</tr>
<tr>
<td>Known acquaintance/peer/ neighbourhood person</td>
<td>27</td>
<td>25.5</td>
</tr>
<tr>
<td>Family member</td>
<td>34</td>
<td>32.07</td>
</tr>
<tr>
<td>Current/former romantic partner</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Temporary caregiver/foster parent</td>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td>Police</td>
<td>4</td>
<td>3.8</td>
</tr>
<tr>
<td>Nurse</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Unknown</td>
<td>7</td>
<td>6.6</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
</tbody>
</table>

Of the family members victimised, 20 were mothers (59%), 4 were fathers (12%) 6 were siblings/step-siblings (17%), 2 were stepfathers (6%) and 2 were stepmothers (6%).

Victim Sex
Details on the victim’s sex were available for 96 of the cases (91% of the sample). Of these cases, males were the target of violence in 32 of the cases (33%), whereas the majority of the victims were females (64; 67%).

Victim Age
Details of the victim’s age were available for 95 of the cases (89.6% of the sample). Of these cases, children/youth were the target of violence in 34 cases (36%), and adults were the victims in 61 cases (64%).

Violence Severity (VAS scores)
There were sufficient details to code VAS scores for 96% of the index offences (102 cases). Although the VAS scale ranges from 0–100, the criteria for inclusion as a violent offence in this study required physical aggression towards another person. Thus, the minimum score on the VAS is 41. Scores for the offences ranged from 41 to 95, with a mean of 60.68 (SD = 8.72).

Intoxication at the Time of the Offence
In regards to intoxication with alcohol or drugs at the time of committing the offence, 31 (29%) had evidence of being intoxicated, and 75 (71%) had no evidence of being intoxicated.

Peer Involvement in the Offence
Within the violent sample, 51 (48%) had evidence of peer involvement in their offence, and 55 (52%) had no evidence of peer involvement.

TSCC Scores for the Violent Sample
Within the violent sample, youth with TSCC results available ($M = 15.57$, $SE = .10$), and youth without TSCC results ($M = 15.26$, $SE = .12$) were not significantly different on the variable age at referral, $t (104) = -1.93$, $p = .06$.

Youth with TSCC results were not significantly different from youth without TSCC results on their proportions of reactive and instrumental violence, $\chi^2 (1, n = 106) = .06$, $p = .81$. In addition, youth with TSCC results were not significantly different from youth without TSCC results in relation to their proportions of family and community victims, $\chi^2 (1, n = 100) = .95$, $p = .33$. Finally, youth with TSCC results were not significantly different from youth without TSCC results in relation to their proportions of Māori and Pākehā ethnicity, $\chi^2 (1, n = 96) = 1.13$, $p = .29$.

The results of these tests indicate that the results of the TSCC analyses can be generalised to the complete sample of violent female youth.

Rates of Nonviolent Offending across the Violent Subgroups

Motivational subtype of violence. Of the reactively violent youth, 71% (42) had committed a nonviolent offence. This rate was comparable to that of the instrumentally violent youth (77%; 36), $\chi^2 (1, N = 106) = 0.39$, $p = .53$.

Victim subtype. Of the violent youth who victimised family members, 62% (21) had also committed a nonviolent offence. The violent youth who victimised community members had a slightly higher rate of committing nonviolent offences (79%; 52), with this difference approaching significance, $\chi^2 (1, N = 100) = 3.30$, $p = .07$.

Ethnicity. Of the violent Māori youth, 80% (54) had also committed a nonviolent offence. This rate was comparable to the Pākehā youth where 68% had committed a nonviolent offence, $\chi^2 (1, N = 96) =1.45$, $p = .23$. 

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Section Four: Can We Predict Instrumental and Reactive Violence?

This aim was investigated using logistic regression. Logistic regression permits the prediction of group membership of a categorical dichotomous outcome (e.g., reactive or instrumental violence), from both continuous and categorical predictor variables. On the SPSS software, binary logistic regressions were conducted through the multinomial regression tool, due to the advantages of the implementation and output options available for this approach (e.g., ability to specify the reference category for analyses).

This question was addressed in four subgroups of variables, (1) demographic variables, (2) offence related characteristics, (3) TSCC scores, and (4) background psychosocial variables. For the following analyses, reactive violence was specified as the reference group.

As this process yielded many models which were subsequently subjected to backwards selection, for succinctness, only the results of the final models for each subgroup are interpreted in the text. The reader is referred to the corresponding tables for the results of each initial regression model.

To aid the reader in interpretation of the logistic regression models, a brief explanation of $R^2$ and classification accuracy is provided below.

$R^2$ is a measure of model fit that indicates the percentage of variance in the dependent variable explained by the independent variables in the model. Normal $R^2$ cannot be calculated for logistic regression models so Nagelkerke’s $R^2$ was developed as an analogue of ordinary $R^2$ for generalised linear models (such as logistic regression). It can be interpreted in the same manner as for ordinary $R^2$ (Nagelkerke, 1991).

The classification accuracy describes the extent to which the model accurately predicts the dependent variable (in this case, violence sub-type) (Hosmer, Lemeshow, & Sturdivant, 2013). This is calculated by comparing the predicted score of the individuals (as reactive or instrumental violence) on the basis of the independent variables in the model, with their actual violence subtype in the data. For example, an overall percentage of 60% means that 60% of individuals have been accurately classified as either reactive or instrumental on the basis of the model. There is no absolute cut-off point that represents good fit, but 100% would represent perfect fit, in that all individuals would be correctly classified on the basis of the model (Hosmer et al., 2013).
Demographic Variables

The variables *age at time of offence*, *SED index scores*, and *ethnicity* were entered into one logistic regression analysis.

Only the ethnic groups Māori (n = 68) and Pākehā (n = 28) were entered into this analysis due to the low count of subjects in the other two groups, *Pacific Island* (5) and *Other Ethnicity* (5). It was not deemed suitable to collapse these groups further.

The socioeconomic deprivation scale was collapsed from a decile scale (10 levels) to a quintile scale (5 levels) for the logistic regression analyses, as the decile scale would have resulted in too few numbers in each decile group.

As can be seen in Table 17, the analysis demonstrated that *age at time of offence* and *quintile score* were not predictive of violence subtype (*p* > .05), and ethnicity was significantly predictive of violence subtype (*p* = .02).

Table 17

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at time of offence</td>
<td>0.40</td>
<td>0.17</td>
<td>0.40</td>
<td>1.18</td>
<td>.71–1.97</td>
<td>0.52</td>
<td>0.99</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>SED quintile (Reference quintile = 5)</td>
<td>1.46</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.83ᵃ</td>
<td>0.98</td>
<td>1.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-0.31</td>
<td>0.25</td>
<td>0.74</td>
<td>.22–2.47</td>
<td>0.62</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-0.64</td>
<td>0.66</td>
<td>0.53</td>
<td>.11–2.48</td>
<td>0.42</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.33</td>
<td>0.27</td>
<td>1.39</td>
<td>.40–4.75</td>
<td>0.61</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-0.08</td>
<td>0.01</td>
<td>0.93</td>
<td>.26–3.30</td>
<td>0.91</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity (Reference group: Pākehā)</td>
<td>5.66</td>
<td>1.16</td>
<td>5.21</td>
<td>3.19</td>
<td>1.18–8.62</td>
<td><strong>0.02</strong></td>
<td>0.99</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
ᵃ This *p*-value is derived from the likelihood ratio test, all other *p*-values presented are from the Wald test.

Nagelkerke’s $R^2$ = .11. Classification accuracy = 61%.

The next step involved removing the redundant variables from the model one by one, with the highest *p*-value first, to ensure that this did not change the significance of other variables. The removal of *SED scores* and *age at time of offence* (in that order) left a final model with ethnicity as significantly predictive of violence motivation. For succinctness the results of each of these analyses are not presented. As can be seen in Table 18, Māori ethnicity (as opposed to Pākehā) was associated with an increased likelihood of instrumental violence (a decreased
likelihood of reactive violence), as indicated by the odds ratio above one. Māori ethnicity was associated with an increase in the odds for instrumental violence by a factor of 3.37. In contrast, Pākehā ethnicity was associated with an increase in the odds of reactive violence by a factor of 3.37.

Table 18

**Demographic Variables and Prediction of Violence Subtype by Logistic Regression: Final Regression Model**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity (Reference group: Pākehā)</td>
<td>6.52</td>
<td>1.22</td>
<td>6.34</td>
<td>3.37</td>
<td>1.26–8.98</td>
<td>0.02</td>
</tr>
</tbody>
</table>

**Note.** LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval. Nagelkerke’s $R^2 = .09$. Classification accuracy = 59.4%.

The following raw frequencies and percentages provide further detail about this association. Of the Māori youth, 47% were coded as having perpetrated a reactively violent offence, compared to 75% of the Pākehā youth. Of the Māori youth, 53% were coded as having an instrumentally violent offence compared to 25% of the Pākehā youth. The differences in these proportions were significant, $\chi^2 (1, n = 96) = 6.26, p = .01$.

**Offence Related Variables**

Another aim of this thesis was to investigate what characteristics of the index offence were associated with violence motivation subtype.

To investigate this question, the variables *evidence of intoxication during the offence, peer involvement in the offence, victim subtype, victim age* and *victim sex* were entered into one logistic regression analysis. The results of these analyses are displayed in Table 19.

As can be seen in Table 19, *peer involvement in the offence* and *victim subtype* were significantly predictive of violence subtype.
Table 19

**Offence Characteristics in the Prediction of Victim Subtype by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intoxication at the time of offence</td>
<td>0.95</td>
<td>-0.57</td>
<td>0.94</td>
<td>0.56</td>
<td>.18–1.79</td>
<td>0.33</td>
<td>0.95</td>
<td>1.06</td>
</tr>
<tr>
<td>Peers involved in index offence</td>
<td>6.97</td>
<td>1.54</td>
<td>6.69</td>
<td>4.64</td>
<td>1.45–14.86</td>
<td>0.01</td>
<td>0.62</td>
<td>1.62</td>
</tr>
<tr>
<td>Victim subtype (Ref group: CV)</td>
<td>13.51</td>
<td>-3.29</td>
<td>8.19</td>
<td>0.04</td>
<td>.004–.35</td>
<td>0.004</td>
<td>0.52</td>
<td>1.92</td>
</tr>
<tr>
<td>Victim age (Ref group: Child/youth)</td>
<td>0.011</td>
<td>0.06</td>
<td>0.01</td>
<td>1.06</td>
<td>.32–3.54</td>
<td>0.92</td>
<td>0.79</td>
<td>1.26</td>
</tr>
<tr>
<td>Victim sex (Ref group: Female)</td>
<td>0.048</td>
<td>1.4</td>
<td>0.05</td>
<td>1.14</td>
<td>.34–3.85</td>
<td>0.83</td>
<td>0.94</td>
<td>1.07</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval; CV = Community victims.*

The next step involved removing the redundant variables from the model one at a time, with the variable with the highest p-value first. The removal of the variables victim age, victim sex, and intoxication at the time of offence (in that order) did not change the significance of the other variables. For succinctness, the results of these analyses of removing one variable at a time are not presented. This process resulted in a final logistic regression model, which is presented in Table 20.

As can be seen in Table 20, peer involvement in the index offence was associated with an increased likelihood of instrumental violence (decreased likelihood of reactive violence). Peer involvement was associated with an increase in the odds for instrumental violence by a factor of 3.67. Victim subtype was also significantly predictive of violence motivation subtype, having family victims (as opposed to community victims) was associated with a decreased likelihood of instrumental violence (increased likelihood of reactive violence), as indicated by the odds ratio below one. Having family victims (as opposed to community victims) was associated with an increase in the odds for reactive violence by a factor of 32.2 (1/0.031).
Table 20

**Final Model of Offence Characteristics in the Prediction of Violence Motivation by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers involved in index offence</td>
<td>5.59</td>
<td>1.3</td>
<td>5.53</td>
<td>3.67</td>
<td>1.24–10.87</td>
<td>0.019</td>
<td>0.63</td>
<td>1.58</td>
</tr>
<tr>
<td>Victim subtype (Ref group: CV)</td>
<td>19.53</td>
<td>-3.46</td>
<td>10.21</td>
<td>0.031</td>
<td>0.00–.26</td>
<td>0.001</td>
<td>0.63</td>
<td>1.58</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval; CV = Community victims. Nagelkerke’s $R^2 = .53.$ Classification accuracy = 79%.

The following raw frequencies and percentages provide further detail about these associations. Of the reactivity violent youth, 24% were coded as having peers involved in their offence compared to 79% of the instrumentally violent youth, this difference in proportions was significant, $\chi^2 (1, n = 106) = 31.69, p = < .000.$

Of the reactivity violent youth, 60% were coded as having victimised a family member, compared to 2% of the instrumentally violent youth. Of the reactivity violent youth, 40% were coded as having victimised a community member, compared to 98% of the instrumentally violent youth. The differences in these proportions was significant, $\chi^2 (1, n = 100) = 36.82, p < .000.$

**VAS scores.** As the VAS scores were not normally distributed and did not meet the assumptions for logistic regression testing, Mann–Whitney $U$ tests were carried out to evaluate if differences in the severity of violence existed between those who utilised instrumental and reactive violence. The distribution of VAS scores was the same across violence motivation subtypes (reactive $Mdn = 60,$ instrumental $Mdn = 63), U = 1490.50, p = .157.$

**The Trauma Symptom Checklist**

TSCC scores were available and valid for 61 of the violent youth (58% of the sample). Of these scores, 34 (56%) were for youth with reactive violence offences and 27 (44%) for those with instrumental violence offences.

TSCC scale scores were entered into one logistic regression analysis. To avoid problems with collinearity, the subscales of sexual concerns (sexual preoccupation and sexual distress) and dissociation (dissociation-fantasy, and dissociation-overt) were not included in the analysis.
As can be seen in Table 21, the Anger scale was able to significantly predict violence subtype \( (p = .02) \), and the Posttraumatic Stress scale demonstrated a trend towards significance \( (p = .06) \).

Table 21

**TSCC Scales and Prediction of Violence Subtype**

<table>
<thead>
<tr>
<th>TSCC scale</th>
<th>LR(\chi^2)</th>
<th>(\beta)</th>
<th>Wald</th>
<th>(OR)</th>
<th>95% CI</th>
<th>(p)</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>0.27</td>
<td>-0.03</td>
<td>0.27</td>
<td>0.97</td>
<td>.86–1.09</td>
<td>0.60</td>
<td>0.23</td>
<td>4.26</td>
</tr>
<tr>
<td>Depression</td>
<td>1.09</td>
<td>-0.05</td>
<td>1.06</td>
<td>0.95</td>
<td>.86–1.05</td>
<td>0.30</td>
<td>0.31</td>
<td>3.17</td>
</tr>
<tr>
<td>Anger</td>
<td>7.33</td>
<td>0.12</td>
<td>5.92</td>
<td>1.12</td>
<td>1.02–1.23</td>
<td><strong>0.02</strong></td>
<td>0.52</td>
<td>1.93</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>3.80</td>
<td>0.11</td>
<td>3.45</td>
<td>1.11</td>
<td>.99–1.25</td>
<td><strong>0.06</strong></td>
<td>0.24</td>
<td>4.23</td>
</tr>
<tr>
<td>Dissociation</td>
<td>2.32</td>
<td>-0.07</td>
<td>2.11</td>
<td>0.93</td>
<td>.85–1.02</td>
<td>0.15</td>
<td>0.31</td>
<td>3.17</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>1.65</td>
<td>-0.03</td>
<td>1.50</td>
<td>0.97</td>
<td>.92–1.02</td>
<td>0.22</td>
<td>0.63</td>
<td>1.58</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; \(OR\) = Odds ratio; CI = Confidence interval.*

The next step involved removing the other scales from the model one by one, with the highest \(p\)-value first, to ensure that this did not change the significance of other scales. For succinctness the results of each of these analyses of removing one variable at a time are not presented.

The Anxiety scale was removed first as it had the largest \(p\)-value, the removal of this variable altered the significance of the other scales slightly, but only the Anger and Posttraumatic Stress scales remained with \(p\)-values less than .10.

Next, the Depression scale was removed from the model, the removal of this scale altered the significance of the remaining scales, the Dissociation scale became significant \( (p = .04) \), and even more so than the Posttraumatic Stress scale \( (p = .10) \). The Sexual Concerns scale was then removed from the model, the removal of this scale resulted in the Posttraumatic Stress scale becoming non-significant \( (p = .19) \), and the Anger and Dissociation scales becoming more significant \( (p < .05) \). Finally the Posttraumatic Stress scale was removed from the model; this left a final model with the scales *Anger* and *Dissociation*. See Table 22.

This model demonstrated that as scores on the Anger scale increased, the likelihood of instrumental violence increased (and the likelihood of reactive violence decreased); this is illustrated in the table by the odds ratio greater than 1. From the model we estimate that a 10-unit increase on the Anger scale is associated with an increase in the odds of instrumental violence by a factor of 2.01 \( (\exp(0.07*10)) \). The Dissociation scale approached significance, from the model we predict that a 10-unit increase on the Dissociation scale is associated with an increase in the odds of reactive violence by a factor of 1.65 \( (1/\exp(-0.05*10)) \).
Table 22

**Final Model of TSCC Scales and Prediction of Violence Motivation Subtype**

<table>
<thead>
<tr>
<th>TSCC scale</th>
<th>LR$\chi^2$</th>
<th>$\beta$</th>
<th>Wald</th>
<th>$OR$</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger</td>
<td>4.37</td>
<td>0.07</td>
<td>3.81</td>
<td>1.08</td>
<td>1.0–1.16</td>
<td><strong>0.05</strong></td>
<td>0.69</td>
<td>1.46</td>
</tr>
<tr>
<td>Dissociation</td>
<td>2.82</td>
<td>-0.05</td>
<td>2.48</td>
<td>0.95</td>
<td>0.89–1.01</td>
<td><strong>0.10</strong></td>
<td>0.69</td>
<td>1.46</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval. Nagelkerke’s $R^2 = .09$. Classification accuracy = 66%.*

**Background Psychosocial Variables**

Given the large number of psychosocial variables, to select variables for a final model, a series of logistic regression analyses were conducted separately with each psychosocial *domain* of variables (mental health, substance use, developmental, maltreatment, family, school, peer and other problem behaviours) as predictors of the likelihood of instrumental violence relative to reactive violence. Most analyses included multiple variables in one model; however, in some of the domains, variables were entered into separate analyses as a precaution against multicollinearity. For example, for the mental health domain, a case that is positively coded for a history of any mental health problem will also be coded positively for one of the specific diagnoses, hence a separate analysis was conducted.

Once these were completed, a combined model was built which included the variables identified in the domain by domain analyses as individually predictive of violence subtype. Variables with a $p < .10$ were retained for the combined model. This criteria was used in order to avoid eliminating possibly predictive variables too early in the model building process. In the final combined model, the variables were eliminated one-by-one until all variables had a $p$-value less than .10.

The method used in the domain by domain analyses (whereby multiple variables were entered into each analysis and those variables with a $p$-value less than .10 were retained for the combined model), was selected as it was considered to give more accurate results than using multiple bivariate analyses for this stage (e.g., correlations). By entering all variables in the domain at once, the significance of each variable was controlled for the other variables in the model and therefore only the most predictive variables were included in the initial combined models. By using this method, fewer variables were included in the initial combined models.
than would have been had the bivariate method been used. Including fewer variables in the initial combined models was beneficial, given that the dataset was not very large. Multicollinearity had been checked for in each analysis so it was hoped that no masking of significant variables would occur. However, I found with this method that some of the domain by domain analyses violated a guideline sometimes used in logistic regression. The guideline states that the ratio of the number of events to the number of parameters estimated should be at least 10 (Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996). If the ratio is too small, the accuracy and precision of the regression coefficients may not be adequate and misleading associations between variables may be found. For some of the logistic regression analyses, the ratio of the number of cases to the number of estimated parameters was less than 10. For this reason, checks were performed to investigate whether the final combined models would be different, had a different variable selection method been used. The checks consisted of running logistic regressions with the outcome and each predictor variable on its own. Any variables that were significant at the 0.1 level that were not significant at the 0.1 level in the original domain-by-domain analyses were inserted into the final combined model. It was found that these variables became non-significant once the effects of the other variables in the final model were taken into account.

These checks effectively compared two variable selection methods: (1) enter all predictor variables into each domain-by-domain analysis at once and include those significant at the 0.1 level in the initial combined model, and (2) perform separate logistic regressions for each predictor with the outcome variable and include any that are significant at the 0.1 level in the initial combined model. I acknowledge that there are many other variable selection methods also. These checks confirmed that these two variable selection methods would have yielded the same results (the same variables would have been retained in the final combined models). Hence I am able to confidently present the results of the final models.

**Mental health problems.** Logistic regression analyses were conducted with the variables history of mental health disorder, total number of mental health disorders and specific mental health diagnoses in subgroups of internalising and externalising disorders as independent variables in four separate analyses. The results of these analyses are displayed in Table 23.

As can be seen in Table 23, no mental health variables were significantly predictive of motivational subtype of violence at the $p < .05$ level. However, having a history of CD and/or

---

1 Masking is where two correlated variables, which are actually each significantly related to the outcome, appear non-significant. This is because the tests performed in regression analyses are conditional on having all other variables in the model present. If one of the variables were removed, then the other one would become significant.
ODD indicated a trend toward significance ($p < .10$). The presence of these diagnoses was associated with an increased likelihood of instrumental violence (decreased likelihood of reactive violence), as shown by the odds ratio above one. The presence of these diagnoses was associated with an increase in odds for instrumental violence by a factor of 2.2.

Table 23

*Mental Health Variables and Prediction of Violence Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$LR \chi^2$</th>
<th>$\beta$</th>
<th>Wald</th>
<th>$OR$</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of any MH diagnosis</td>
<td>0.49</td>
<td>0.32</td>
<td>0.48</td>
<td>1.38</td>
<td>.56–3.4</td>
<td>0.49</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total number of MH diagnoses</td>
<td>0.00</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.991</td>
<td>.73–1.34</td>
<td>0.95</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CD and/or ODD</td>
<td>3.55</td>
<td>0.79</td>
<td>3.47</td>
<td>2.20</td>
<td>.96–5.0</td>
<td><strong>0.06</strong></td>
<td>0.91</td>
<td>1.10</td>
</tr>
<tr>
<td>ADHD</td>
<td>2.21</td>
<td>-0.88</td>
<td>2.08</td>
<td>0.41</td>
<td>.13–1.37</td>
<td>0.15</td>
<td>0.93</td>
<td>1.08</td>
</tr>
<tr>
<td>Substance use disorder</td>
<td>0.00</td>
<td>0.03</td>
<td>0.00</td>
<td>1.03</td>
<td>.44–2.40</td>
<td>0.95</td>
<td>0.93</td>
<td>1.08</td>
</tr>
<tr>
<td>Depression</td>
<td>0.69</td>
<td>0.46</td>
<td>0.66</td>
<td>1.59</td>
<td>.53–4.72</td>
<td>0.41</td>
<td>0.79</td>
<td>1.26</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.36</td>
<td>-0.95</td>
<td>1.21</td>
<td>0.39</td>
<td>.07–2.09</td>
<td>0.27</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>PTSD</td>
<td>1.19</td>
<td>0.63</td>
<td>1.17</td>
<td>1.89</td>
<td>.60–5.88</td>
<td>0.28</td>
<td>0.93</td>
<td>1.07</td>
</tr>
<tr>
<td>Psychosis</td>
<td>1.27</td>
<td>-0.86</td>
<td>1.19</td>
<td>0.42</td>
<td>.09–1.98</td>
<td>0.27</td>
<td>0.88</td>
<td>1.14</td>
</tr>
<tr>
<td>DSH</td>
<td>0.07</td>
<td>-0.11</td>
<td>0.07</td>
<td>0.89</td>
<td>.37–2.12</td>
<td>0.80</td>
<td>0.88</td>
<td>1.14</td>
</tr>
</tbody>
</table>

*Note.* $LR = $ Likelihood ratio test; $OR = $ Odds ratio; CI = Confidence interval.

**Substance use history.** A logistic regression analysis was conducted with the *total number of drug types used* as an independent predictor variable. This was followed by a second logistic regression with the specific drug types (stimulant, cannabis, and other drugs) as predictors. As only one youth had a history of opiate use, opiate use was not included in the analysis. The results of these analyses are displayed in Table 24. As can be seen in the table, no substance use variables were significantly predictive of motivational subtype of violence.
Table 24

**Substance Use and Prediction of Violence Subtype by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabis</td>
<td>0.286</td>
<td>0.11</td>
<td>0.286</td>
<td>1.12</td>
<td>0.73–1.71</td>
<td>0.59</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Stimulants</td>
<td>0.001</td>
<td>0.02</td>
<td>0.001</td>
<td>1.02</td>
<td>0.32–3.27</td>
<td>0.97</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Other drugs</td>
<td>0.03</td>
<td>-0.08</td>
<td>0.03</td>
<td>0.92</td>
<td>0.39–2.19</td>
<td>0.86</td>
<td>0.88</td>
<td>1.13</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

**Maltreatment.** The variables *history of maltreatment, number of maltreatment types* and specific forms of maltreatment were entered into three separate logistic regression analyses. The results of these analyses are displayed in Table 25. As seen in Table 25, the maltreatment variables were unable to predict motivational subtype of violence.

Table 25

**Maltreatment History and Prediction of Violence Subtype by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of maltreatment</td>
<td>0.18</td>
<td>-0.26</td>
<td>0.17</td>
<td>0.77</td>
<td>0.23–2.58</td>
<td>0.68</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Number of maltreatment</td>
<td>0.49</td>
<td>0.98</td>
<td>0.49</td>
<td>1.10</td>
<td>0.84–1.45</td>
<td>0.48</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Witness violence</td>
<td>0.68</td>
<td>0.38</td>
<td>0.67</td>
<td>1.46</td>
<td>0.59–3.61</td>
<td>0.41</td>
<td>0.77</td>
<td>1.29</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>0.83</td>
<td>0.42</td>
<td>0.82</td>
<td>1.52</td>
<td>0.61–3.80</td>
<td>0.37</td>
<td>0.79</td>
<td>1.26</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td>0.45–2.23</td>
<td>1.00</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>0.21</td>
<td>-0.21</td>
<td>0.21</td>
<td>0.81</td>
<td>0.34–1.97</td>
<td>0.65</td>
<td>0.85</td>
<td>1.17</td>
</tr>
<tr>
<td>Neglect</td>
<td>0.58</td>
<td>-0.31</td>
<td>0.57</td>
<td>0.73</td>
<td>0.32–1.65</td>
<td>0.45</td>
<td>0.95</td>
<td>1.05</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

**Developmental background.** A logistic regression analysis was conducted with the variable *age when problem behaviours began*, and a second analysis was conducted with the variables *pregnancy stress, cognitive impairment/borderline functioning, anger problems, grief/bereavement issues, poor social skills and ADHD type symptoms* as predictors. The results of these analyses are displayed in Table 26. As seen in Table 26, none of these variables were able to significantly predict motivational subtype of violence.
**Table 26**

*Developmental Variables and Prediction of Violence Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age when problem behaviours began</td>
<td>1.61</td>
<td>-0.08</td>
<td>0.77</td>
<td>0.93</td>
<td>0.82–1.04</td>
<td>0.21</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pregnancy stress</td>
<td>0.37</td>
<td>-0.3</td>
<td>0.37</td>
<td>0.74</td>
<td>0.28–1.94</td>
<td>0.54</td>
<td>0.87</td>
<td>1.14</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>0.36</td>
<td>-0.35</td>
<td>0.36</td>
<td>0.7</td>
<td>0.22–2.23</td>
<td>0.55</td>
<td>0.86</td>
<td>1.17</td>
</tr>
<tr>
<td>Anger problems</td>
<td>1.13</td>
<td>-0.45</td>
<td>1.12</td>
<td>0.64</td>
<td>0.27–1.47</td>
<td>0.29</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>Grief/bereavement issues</td>
<td>0.19</td>
<td>0.26</td>
<td>0.19</td>
<td>1.3</td>
<td>0.40–4.21</td>
<td>0.66</td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>0.24</td>
<td>-0.27</td>
<td>0.23</td>
<td>0.76</td>
<td>0.26–2.26</td>
<td>0.63</td>
<td>0.93</td>
<td>1.07</td>
</tr>
<tr>
<td>ADHD type symptoms</td>
<td>1.66</td>
<td>-0.59</td>
<td>1.63</td>
<td>0.55</td>
<td>0.22–1.37</td>
<td>0.2</td>
<td>0.88</td>
<td>1.14</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

**Family background.** This domain was investigated in three separate logistic regression analyses. The variables *parental status, contact with biological mother and contact with biological father* were entered into one analysis. The variable *changes in caregivers* was entered into a second analysis. *CYF care history, parental criminality, parental incarceration, sibling criminality, history of mental health problems in family, parental illicit drug abuse* and *parental alcohol abuse* were entered into a third analysis. The results of these analyses are displayed in Table 27. None of the variables were predictive of violence motivation subtype at the *p* < .05 level of significance. Sibling criminality approached significance, and was associated with an increased likelihood of instrumental violence (a decreased likelihood of reactive violence), as indicated by the odds ratio above one. The presence of sibling criminality was associated with an increase in the odds of instrumental violence by a factor of 2.62.

The variable *parental illicit drug abuse* also approached significance, and was associated with an increased likelihood of instrumental violence (decreased likelihood of reactive violence), as demonstrated by the odds ratio above one. The presence of parental illicit drug abuse was associated with an increase in the odds of instrumental violence by a factor of 3.17.
Table 27

*Family Background Variables and Prediction of Violence Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent status (Ref group: Together)</td>
<td></td>
<td>0.02</td>
<td>0.07</td>
<td>0.02</td>
<td>1.07</td>
<td>.39–2.93</td>
<td>0.90</td>
<td>0.96</td>
<td>1.04</td>
</tr>
<tr>
<td>Mother contact (Ref group: Some or close)</td>
<td></td>
<td>0.46</td>
<td>-0.47</td>
<td>0.45</td>
<td>0.62</td>
<td>.16–2.47</td>
<td>0.50</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Father contact (Ref group: Some or close)</td>
<td></td>
<td>1.62</td>
<td>0.59</td>
<td>1.6</td>
<td>1.8</td>
<td>.73–4.46</td>
<td>0.21</td>
<td>0.93</td>
<td>1.07</td>
</tr>
<tr>
<td>Changes in caregiver</td>
<td></td>
<td>2.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reference: 5 or more changes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No changes</td>
<td></td>
<td></td>
<td>-0.45</td>
<td>0.39</td>
<td>0.64</td>
<td>.16–2.60</td>
<td>0.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 change</td>
<td></td>
<td></td>
<td>0.34</td>
<td>0.26</td>
<td>1.4</td>
<td>.39–5.06</td>
<td>0.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2–4 changes</td>
<td></td>
<td></td>
<td>0.51</td>
<td>1.08</td>
<td>1.66</td>
<td>.64–4.35</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CYF care history</td>
<td></td>
<td>0.09</td>
<td>0.13</td>
<td>0.08</td>
<td>1.13</td>
<td>.49–2.63</td>
<td>0.76</td>
<td>0.93</td>
<td>1.06</td>
</tr>
<tr>
<td>Parental criminality</td>
<td></td>
<td>0.08</td>
<td>-0.16</td>
<td>0.08</td>
<td>0.85</td>
<td>.27–2.64</td>
<td>0.78</td>
<td>0.54</td>
<td>1.85</td>
</tr>
<tr>
<td>Parental incarceration</td>
<td></td>
<td>0.88</td>
<td>-0.65</td>
<td>0.87</td>
<td>0.52</td>
<td>.13–2.05</td>
<td>0.35</td>
<td>0.53</td>
<td>1.89</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td></td>
<td>3.47</td>
<td>0.97</td>
<td>3.39</td>
<td>2.62</td>
<td>.93–7.35</td>
<td>0.06</td>
<td>0.83</td>
<td>1.2</td>
</tr>
<tr>
<td>History of MH problems in family</td>
<td></td>
<td>0.76</td>
<td>-0.4</td>
<td>0.75</td>
<td>0.67</td>
<td>.27–1.65</td>
<td>0.39</td>
<td>0.92</td>
<td>1.08</td>
</tr>
<tr>
<td>Parental illicit drug abuse</td>
<td></td>
<td>3.93</td>
<td>1.15</td>
<td>3.78</td>
<td>3.17</td>
<td>.99–10.15</td>
<td>0.05</td>
<td>0.5</td>
<td>2.07</td>
</tr>
<tr>
<td>Parental alcohol abuse</td>
<td></td>
<td>0.13</td>
<td>-0.2</td>
<td>0.13</td>
<td>0.82</td>
<td>.28–2.43</td>
<td>0.72</td>
<td>0.55</td>
<td>1.8</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
* This p-value is derived from the likelihood ratio tests (other p values derived from the Wald test).*

**School background.** The variable number of schools was entered into a logistic regression analysis. A second logistic regression analysis was conducted with school learning problems, school behaviour problems, truancy and exclusions as predictor variables. The results of these analyses are displayed in Table 28. As can be seen in Table 28, none of the school background variables were able to significantly predict violence motivation subtype.
Table 28

**School Related Variables and Relationship to Motivational Subtype of Violence**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of schools</td>
<td>(Reference: 6 or more)</td>
<td>0.37</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.83</td>
<td>–</td>
</tr>
<tr>
<td>3 or less</td>
<td></td>
<td>0.15</td>
<td>0.05</td>
<td>1.15</td>
<td>0.33–4.07</td>
<td>0.82</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>4 or 5</td>
<td></td>
<td>0.30</td>
<td>0.36</td>
<td>1.35</td>
<td>0.50–3.64</td>
<td>0.55</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Learning problems</td>
<td>Yes</td>
<td>1.56</td>
<td>-0.54</td>
<td>1.53</td>
<td>0.59</td>
<td>0.25–1.37</td>
<td>0.22</td>
<td>0.97</td>
<td>1.02</td>
</tr>
<tr>
<td>Behavioural problems</td>
<td>Yes</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.97</td>
<td>1.68–5.90</td>
<td>0.99</td>
<td>0.66</td>
<td>1.50</td>
</tr>
<tr>
<td>Exclusions</td>
<td>Yes</td>
<td>0.00</td>
<td>0.01</td>
<td>0.00</td>
<td>1.01</td>
<td>0.44–2.30</td>
<td>0.99</td>
<td>0.89</td>
<td>1.12</td>
</tr>
<tr>
<td>Prevalent truancy</td>
<td>Yes</td>
<td>1.66</td>
<td>0.70</td>
<td>1.60</td>
<td>2.02</td>
<td>0.68–6.00</td>
<td>0.21</td>
<td>0.72</td>
<td>1.39</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.*

*a This p-value is derived from the likelihood ratio tests (other p-values derived from the Wald test).*

**Peer background and other problem behaviours.** For this domain, the variables bully, bullied, gang involvement, delinquent partner, and pregnancy, prostitution and ran away were entered as predictor variables in one logistic regression analysis.

As can be seen in Table 29, being a bully was associated with increased likelihood for instrumental violence (decreased likelihood for reactive violence), as indicated by the odds ratio above one. Being identified as a bully increased the odds of instrumental violence by a factor of 3.15. The variable delinquent romantic partner approached significance, and was associated with increased likelihood of instrumental violence (decreased likelihood of reactive violence). Having a delinquent romantic partner increased the odds for instrumental violence by a factor of 2.25.

Table 29

**Peer and Other Problem Behaviours and Prediction of Violence Subtype by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullied</td>
<td>0.01</td>
<td>-0.05</td>
<td>3.42</td>
<td>0.94</td>
<td>.35–2.54</td>
<td>0.91</td>
<td>0.92</td>
<td>1.09</td>
</tr>
<tr>
<td>Bully</td>
<td>6.22</td>
<td>1.15</td>
<td>6.01</td>
<td>3.15</td>
<td>1.26–7.90</td>
<td><strong>0.01</strong></td>
<td>0.94</td>
<td>1.06</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>0.83</td>
<td>0.49</td>
<td>0.82</td>
<td>1.65</td>
<td>.56–4.82</td>
<td>0.36</td>
<td>0.84</td>
<td>1.18</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>3.12</td>
<td>0.8</td>
<td>3.07</td>
<td>2.25</td>
<td>.91–5.54</td>
<td><strong>0.08</strong></td>
<td>0.91</td>
<td>1.1</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>1.63</td>
<td>0.86</td>
<td>1.56</td>
<td>2.37</td>
<td>.61–9.20</td>
<td>0.21</td>
<td>0.96</td>
<td>1.04</td>
</tr>
<tr>
<td>Prostitution</td>
<td>0.036</td>
<td>-0.15</td>
<td>0.036</td>
<td>0.863</td>
<td>.19–3.98</td>
<td>0.86</td>
<td>0.92</td>
<td>1.08</td>
</tr>
<tr>
<td>Ran away</td>
<td>1.01</td>
<td>-0.45</td>
<td>0.997</td>
<td>0.636</td>
<td>.26–1.55</td>
<td>0.32</td>
<td>0.94</td>
<td>1.06</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.*
Combined Model of Psychosocial Variables

The previous analyses investigated the effects of predictor variables within domains; the current analysis provided a predictive model across all psychosocial domains to predict motivational subtype of violence. Predictor variables selected for this analysis were determined by the results of the Wald tests from the domain by domain analyses. Variables with a $p < .10$ were retained in the current analysis. These variables included: CD and/or ODD, sibling criminality, parental illicit drug use, delinquent partner and bully. In order to provide more detail of these variables, the raw frequencies of these variables across the two violence subtypes are presented in Table 30.

Table 30

Frequencies of the Predictor Variables Across Instrumental and Reactive Violence, And Chi Square Results Testing for Significant Differences

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Instrumental ($n$, %)</th>
<th>Reactive ($n$, %)</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sibling criminality</td>
<td>17 (36.2)</td>
<td>9 (15.3)</td>
<td>6.16</td>
<td>0.01</td>
</tr>
<tr>
<td>CD and/or ODD</td>
<td>26 (55.3)</td>
<td>23 (39)</td>
<td>2.81</td>
<td>0.09</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>21 (44.7)</td>
<td>16 (27.1)</td>
<td>3.55</td>
<td>0.06</td>
</tr>
<tr>
<td>Parental drug abuse</td>
<td>26 (55.3)</td>
<td>20 (33.9)</td>
<td>4.88</td>
<td>0.03</td>
</tr>
<tr>
<td>Bully</td>
<td>21 (44.7)</td>
<td>11 (18.6)</td>
<td>8.41</td>
<td>0.004</td>
</tr>
</tbody>
</table>

The selected variables were entered into one logistic regression analysis. As can be seen in Table 31, the variable bully ($p < .05$) was the only significant predictor of violence subtype. However the variable sibling criminality approached significance ($p < .10$).

Table 31

Prediction of Violence Subtype by Psychosocial Variables: Initial Logistic Regression Model

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LR$\chi^2$</th>
<th>$\beta$</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delinquent partner</td>
<td>2.24</td>
<td>0.67</td>
<td>2.22</td>
<td>1.95</td>
<td>0.81–4.71</td>
<td>0.13</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>Bully</td>
<td>5.59</td>
<td>1.12</td>
<td>5.41</td>
<td>3.06</td>
<td>1.19–7.85</td>
<td>0.02</td>
<td>0.9</td>
<td>1.11</td>
</tr>
<tr>
<td>CD and/or ODD</td>
<td>0.443</td>
<td>0.29</td>
<td>0.44</td>
<td>1.34</td>
<td>0.57–3.17</td>
<td>0.50</td>
<td>0.92</td>
<td>1.08</td>
</tr>
<tr>
<td>Sibling crime</td>
<td>2.79</td>
<td>0.87</td>
<td>2.73</td>
<td>2.38</td>
<td>0.85–6.64</td>
<td>0.09</td>
<td>0.86</td>
<td>1.15</td>
</tr>
<tr>
<td>Parent drug use</td>
<td>0.87</td>
<td>0.423</td>
<td>2.73</td>
<td>1.52</td>
<td>0.63–3.70</td>
<td>0.35</td>
<td>0.85</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

Nagelkerke’s $R^2 = .21$. Classification accuracy = 71%.
The next step involved removing the other variables from the model one by one, with the highest p-value first, to see if this impacted on the significance of other variables. Depending on each analysis, the next redundant variable was removed (highest p-value) one at a time until all variables had a \( p \leq .10 \). The removal of the variables \textit{CD and/or ODD, parent drug use} and \textit{delinquent partner} (in that order) did not change the overall significance of the other variables. For succinctness the results of each of these analyses are not presented.

After removal of the non-significant/redundant variables \( (p > .10) \), two predictors (sibling criminality and bully) were left for inclusion in the final logistic regression analysis, see Table 32. Results indicated that both of these variables made a significant contribution to the prediction of motivational subtype of violence at the \( p < .05 \) level. As in the previous analyses, having siblings involved in crime and perpetrating bullying were associated with an increased likelihood of instrumental violence.

The presence of sibling criminality was associated with an increase in the odds for instrumental violence by a factor of 3.2. Perpetrating bullying was associated with an increase in the odds for instrumental violence by a factor of 3.57.

Table 32

\begin{tabular}{lcccccccc}
 Predictor & LR\( \chi^2 \) & \( \beta \) & Wald & \( OR \) & 95\% CI & \( p \) & Tolerance & VIF \\
 Sibling criminality & 5.9 & 1.17 & 5.62 & 3.2 & 1.2–8.40 & \textbf{0.02} & 0.99 & 1.03 \\
 Bully & 8.16 & 1.28 & 7.75 & 3.57 & 1.45–8.78 & \textbf{0.01} & 0.99 & 1.03 \\
\end{tabular}

\textit{Note.} LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
Nagelkerke’s \( R^2 = .17 \). Classification accuracy = 67.9%.

\section*{Summary of Section Four: Can we Predict Violence Subtype?}

This section reported the demographic, psychosocial, offence related and trauma symptom correlates of instrumental and reactive violence.

The logistic regression analyses identified some factors that were able to significantly predict motivational subtype of violence (instrumental versus reactive). It must be noted that many of the variables were prevalent for all of the youth and these analyses only identified factors that may differentiate between the two groups. Other factors may still be recognised as risk factors for both of these types of violence.
Of the demographic variables, ethnicity was significantly predictive of motivational subtype of violence. Māori youth were associated with increased odds for engaging in instrumental violence, whereas Pākehā youth were associated with increased odds of engaging in reactive violence.

Of the offence related variables, peer involvement in the offence was associated with increased likelihood of instrumental violence ($p < .01$). Victim subtype was also significantly predictive, with family victims (as opposed to community victims) associated with increased likelihood of reactive violence and community victims associated with increased likelihood of instrumental violence.

Of the TSCC scales, the Anger scale was associated with increased likelihood of instrumental violence. The Dissociation scale approached significance and was associated with an increase in the odds of reactive violence.

In the combined psychosocial logistic regression analysis (which combined the variables significant at the $p < .10$ level of significance in the domain by domain analyses), the variables sibling criminality ($p < .05$) and bully ($p < .01$) were the only significant predictors, and were associated with an increased likelihood of instrumental violence.

**Section Five: Can We Predict Offender-Victim Relationship?**

An additional aim of this thesis was to determine what demographic variables, background psychosocial variables, offence characteristics, and TSCC scale scores were predictive of the offender-victim relationship; family victims ($n = 34$) or community victims ($n = 66$).

The methodology used to investigate these relationships was identical to the approach used in the previous section, but with violence subtype (instrumental versus reactive) substituted for victim subtype (family versus community victims) as the outcome variable in the logistic regression analyses. Where identical, the methodology will not be repeated here.

For all logistic regression analyses, community victims was used as the reference group.

**Demographic Variables**

As can be seen in Table 33, the logistic regression analysis demonstrated that age at time of offence and quintile score were not predictive of victim subtype. Ethnicity was significantly predictive of victim subtype.
Table 33

Demographic Variables and Prediction of Victim Subtype By Logistic Regression

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at time of offence</td>
<td>1.63</td>
<td>-0.4</td>
<td>1.6</td>
<td>0.67</td>
<td>.36–1.24</td>
<td>0.21</td>
<td>0.99</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>SED quintile (Reference quintile: 5)</td>
<td>4.71</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.32&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.98</td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1.03</td>
<td>2.26</td>
<td>2.81</td>
<td>.73–10.77</td>
<td>0.13</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.69</td>
<td>2.26</td>
<td>1.99</td>
<td>.35–11.25</td>
<td>0.43</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-0.53</td>
<td>0.61</td>
<td>0.59</td>
<td>.09–3.61</td>
<td>0.57</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.94</td>
<td>0.33</td>
<td>2.57</td>
<td>.62–10.71</td>
<td>0.20</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ethnicity (Reference group: Pākehā) | 11.9 | -1.77 | 11.08 | 0.17 | .06–.48 | **0.001** | 0.99 | 1.01 |

*This p-value is derived from the likelihood ratio test, all other p-values presented are from the Wald test.*

Nagelkerke’s $R^2 = .28$. Classification accuracy = 73.6%.

The next step involved removing the redundant variables from the model one at a time. This resulted in a final logistic regression model, which is presented in Table 34. As can be seen in Table 34, Māori ethnicity (as opposed to Pākehā) was associated with a decreased likelihood of having family victims (an increased likelihood of community victims), as indicated by the odds ratio below one. Māori ethnicity was associated with an increase in the odds for community victims by a factor of 6.25 (1/0.16). In contrast, Pākehā ethnicity was associated with an increase in the odds of family victims by a factor of 6.25.

Table 34

Demographic Variables and Prediction of Victim Subtype by Logistic Regression: Final Regression Model

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity (reference group = Pākehā)</td>
<td>13.75</td>
<td>-1.82</td>
<td>12.94</td>
<td>0.16</td>
<td>.06–.44</td>
<td><strong>0.00</strong></td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval. Nagelkerke’s $R^2 = .19$. Classification accuracy = 74.4%.*
The following raw frequencies and percentages provide further detail about this association. Of the Māori youth, 19% were coded as having family victims, compared to 59% of the Pākehā youth. Of the Māori youth, 81% were coded as having community victims compared to 41% of the Pākehā youth. The differences in these proportions were significant, \( \chi^2 (1, n = 90) = 14.26, p < .000. \)

**Offence Related Variables**

The offence related variables *intoxication at the time of offence, peer involvement in the offence, violence subtype, victim age and victim sex* were entered into one logistic regression analysis. As can be seen in Table 35, peer involvement in the offence, violence subtype and victim age were significantly predictive of victim type \((p < .05)\).

Table 35

**Offence Characteristics in the Prediction of Victim Subtype by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LR(\chi^2)</th>
<th>(\beta)</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>(p)</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intoxication at the time of offence</td>
<td>2.11</td>
<td>-1.14</td>
<td>2.06</td>
<td>0.32</td>
<td>.07–1.52</td>
<td>0.15</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Peers involved in index offence</td>
<td>11.34</td>
<td>-2.67</td>
<td>8.91</td>
<td>0.07</td>
<td>.01–.40</td>
<td>0.003</td>
<td>0.65</td>
<td>1.52</td>
</tr>
<tr>
<td>Violence subtype (Ref group: Instrumental)</td>
<td>10.26</td>
<td>2.9</td>
<td>6.64</td>
<td>18.28</td>
<td>2.0–166.72</td>
<td>0.01</td>
<td>0.67</td>
<td>1.49</td>
</tr>
<tr>
<td>Victim age (Ref group: Youth/Child)</td>
<td>5.65</td>
<td>-1.84</td>
<td>5.15</td>
<td>0.16</td>
<td>.03–.78</td>
<td>0.02</td>
<td>0.89</td>
<td>1.12</td>
</tr>
<tr>
<td>Victim sex (Ref group: Female)</td>
<td>0.66</td>
<td>-0.6</td>
<td>0.66</td>
<td>0.55</td>
<td>.13–2.33</td>
<td>0.41</td>
<td>0.96</td>
<td>1.04</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.*

The next step involved removing the redundant variables from the model one at a time. This resulted in a final logistic regression model, which is presented in Table 36.

As can be seen in Table 36, peer involvement in the index offence was associated with decreased likelihood of family victims (increased likelihood of community victims). The presence of peer involvement was associated with an increase in the odds for community victims by a factor of 13.69 \((1/0.07)\).

Violence subtype was significantly predictive of victim subtype. Reactive violence (opposed to instrumental violence) was associated with an increased likelihood of family victims (decreased likelihood of community victims), as indicated by the odds ratio above one. Reactive violence (opposed to instrumental violence) was associated with an increase in the odds for
family victims (opposed to community victims) by a factor of 23.65. At the same time, instrumental violence was associated with increased likelihood of having community victims.

Victim age was significantly predictive of victim subtype. Having youth/child aged victims (as opposed to adult victims) was associated with a decreased likelihood that the victims were family members (increased likelihood of community victims), as indicated by the odds ratio below one. Having youth/child aged victims (opposed to adult aged victims) was associated with an increase in the odds for having community victims (as opposed to family victims) by a factor of 7.69 (1/0.13). At the same time, having adult victims was associated with increased likelihood of having family victims.

Table 36

Final Model of Offence Characteristics in the Prediction of Victim Subtype by Logistic Regression

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LR$\chi^2$</th>
<th>$\beta$</th>
<th>Wald</th>
<th>$OR$</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers involved in index offence</td>
<td>11.54</td>
<td>-2.61</td>
<td>9.04</td>
<td>0.07</td>
<td>.01–.40</td>
<td><strong>0.003</strong></td>
<td>0.69</td>
<td>1.44</td>
</tr>
<tr>
<td>Violence subtype</td>
<td>13.04</td>
<td>3.16</td>
<td>8</td>
<td>23.65</td>
<td>2.64–211.81</td>
<td><strong>0.005</strong></td>
<td>0.7</td>
<td>1.42</td>
</tr>
<tr>
<td>(Ref group: Instrumental)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim age (Ref group: Adult)</td>
<td>7.28</td>
<td>-2.02</td>
<td>6.45</td>
<td>0.13</td>
<td>.03–.63</td>
<td><strong>0.011</strong></td>
<td>0.92</td>
<td>1.09</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; $OR$ = Odds ratio; CI = Confidence interval.
Nagelkerke’s $R^2 = .68$, Classification accuracy = 88%.

The following raw frequencies and percentages provide further detail about these associations. Of the family violent youth, 6% were coded as having peers involved in their offence compared to 70% of the community violent youth, this difference in proportions was significant, $\chi^2 (1, n = 100) = 36.61, p < .000$.

Of the family violent youth, 60% were coded as having a reactively violent offence, compared to 40% of the community violent youth. Of the family violent youth, 2% were coded as having an instrumentally violent offence, compared to 98% of the community violent youth. The differences in these proportions were significant, $\chi^2 (1, n = 100) = 36.82, p < .000$.

Of the family violent youth, 9% were coded as having child/peer aged victims compared to 50% of the community violent youth. Of the family violent youth, 91% were coded as having adult aged victims, compared to 50% of the community violent youth. The differences in these proportions were significant, $\chi^2 (1, n = 95) = 15.68, p < .000$. 92
**VAS scores.** As the VAS scores used in Section Four (which investigated predictors of the motivational subtype of violence) did not meet the assumptions of the logistic regression test and were therefore not included in the logistic regression model, to maintain uniformity with the previous section the same method was carried out here. The Mann–Whitney $U$ test indicated that the distribution of VAS scores was the same across victim types (family victims $Mdn = 60$, community victims $Mdn = 62$), $U = 1313.0$, $p = .09$.

**The Trauma Symptom Checklist**

TSCC scores were available and valid for 61 of the violent youth (58%). However, this analysis used a sample of 59, as only 59 of these were able to be coded for victim type. Of these TSCC scores, 22 (37%) were for youth with family victims and 37 (63%) for those with community victims.

As can be seen in Table 37, the initial logistic regression model demonstrated that three of the TSCC scales (Anger, Dissociation and Sexual Concerns) indicated a trend toward significance in their prediction of victim subtype ($p < .10$).

<table>
<thead>
<tr>
<th>TSCC scale</th>
<th>LR$\chi^2$</th>
<th>$\beta$</th>
<th>Wald</th>
<th>$OR$</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>2.45</td>
<td>-0.11</td>
<td>2.24</td>
<td>0.90</td>
<td>.77–1.03</td>
<td>0.13</td>
<td>0.23</td>
<td>4.41</td>
</tr>
<tr>
<td>Depression</td>
<td>1.21</td>
<td>0.06</td>
<td>1.15</td>
<td>1.06</td>
<td>.95–1.19</td>
<td>0.28</td>
<td>0.32</td>
<td>3.15</td>
</tr>
<tr>
<td>Anger</td>
<td>4.03</td>
<td>-0.10</td>
<td>3.53</td>
<td>0.91</td>
<td>.82–1.00</td>
<td><strong>0.06</strong></td>
<td>0.52</td>
<td>1.92</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>0.19</td>
<td>-0.03</td>
<td>0.18</td>
<td>0.97</td>
<td>.87–1.09</td>
<td>0.67</td>
<td>0.24</td>
<td>4.23</td>
</tr>
<tr>
<td>Dissociation</td>
<td>4.14</td>
<td>0.10</td>
<td>3.60</td>
<td>1.10</td>
<td>.99–1.22</td>
<td><strong>0.06</strong></td>
<td>0.32</td>
<td>3.12</td>
</tr>
<tr>
<td>Sexual Concerns</td>
<td>4.10</td>
<td>0.05</td>
<td>3.39</td>
<td>1.05</td>
<td>1.0–1.12</td>
<td><strong>0.06</strong></td>
<td>0.64</td>
<td>1.57</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; $OR$ = Odds ratio; CI = Confidence interval.

The next step involved removing the other variables from the model one by one, with the highest $p$-value first, to ensure that this did not change the significance of other variables. For succinctness the results of each of these analyses of removing one variable at a time are not presented.

The Posttraumatic Stress scale was removed first as it had the highest $p$-value, the removal of this variable resulted in the Anxiety scale indicating a trend towards significance. Next the Depression scale was removed from the model, which left the Anxiety, Anger and Sexual
Concerns scales approaching significance ($p < .10$), and the Dissociation scale significant at the $p < .05$ level. This model is displayed in Table 38.

The Sexual Concerns scale and the Dissociation scale were associated with increased likelihood of family victims (decreased likelihood of community victims) as indicated by the odds ratios above one. From the model we estimate that a ten unit increase on the Sexual Concerns scale is associated with an increase in the odds of having family victims by a factor of 1.65 ($\exp(.05*10)$).

We also estimate that a ten unit increase on the Dissociation scale is associated with an increase in the odds of having family victims by a factor of 3.00 ($\exp(.11*10)$).

The Anxiety and Anger scales were associated with decreased likelihood of family victims (increased likelihood for community victims) as indicated by the odds ratios below one. From the model we estimate that a ten unit increase on the Anxiety scale is associated with an increase in the odds of having community victims by a factor of 2.46, $1/(\exp(-.09*10))$. We also estimate that a ten unit increase on the Anger scale is associated with an increase in the odds of having community victims by a factor of 2.72, $1/(\exp(-.10*10))$.

Table 38

<table>
<thead>
<tr>
<th>TSCC scale</th>
<th>LRχ²</th>
<th>$\beta$</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>3.52</td>
<td>-0.10</td>
<td>3.03</td>
<td>0.91</td>
<td>.81–1.01</td>
<td>0.08</td>
<td>0.39</td>
<td>2.54</td>
</tr>
<tr>
<td>Anger</td>
<td>3.91</td>
<td>-0.09</td>
<td>3.37</td>
<td>0.92</td>
<td>.83–1.01</td>
<td>0.07</td>
<td>0.59</td>
<td>1.68</td>
</tr>
<tr>
<td>Dissociation</td>
<td>7.29</td>
<td>0.11</td>
<td>5.69</td>
<td>1.12</td>
<td>1.02–1.23</td>
<td>0.02</td>
<td>0.43</td>
<td>2.33</td>
</tr>
<tr>
<td>Sexual Concerns</td>
<td>3.89</td>
<td>0.05</td>
<td>3.21</td>
<td>1.05</td>
<td>.99–1.12</td>
<td>0.07</td>
<td>0.65</td>
<td>1.54</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
Nagelkerke’s $R^2 = .25$. Classification accuracy = 71%.

Background Psychosocial Variables

Mental health problems. As can be seen in Table 39, the presence of a diagnosis of CD and/or ODD was associated with a decreased likelihood of having family victims (i.e., an increased likelihood of having community victims), as indicated by the odds ratio below one. The presence of these diagnoses was associated with an increase in odds for community victims by a factor of 2.78 ($1/0.36$).

Having a diagnosis of ADHD was associated with an increased likelihood of having family victims (i.e., decreased likelihood of having community victims), as indicated by the odds ratio above one. The presence of ADHD was associated with an increase in the odds of having family victims by a factor of 2.72, $1/(\exp(-.10*10))$. 

Table 38

**Final Model of TSCC Scales and Prediction of Victim Subtype**

<table>
<thead>
<tr>
<th>TSCC scale</th>
<th>LRχ²</th>
<th>$\beta$</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>3.52</td>
<td>-0.10</td>
<td>3.03</td>
<td>0.91</td>
<td>.81–1.01</td>
<td>0.08</td>
<td>0.39</td>
<td>2.54</td>
</tr>
<tr>
<td>Anger</td>
<td>3.91</td>
<td>-0.09</td>
<td>3.37</td>
<td>0.92</td>
<td>.83–1.01</td>
<td>0.07</td>
<td>0.59</td>
<td>1.68</td>
</tr>
<tr>
<td>Dissociation</td>
<td>7.29</td>
<td>0.11</td>
<td>5.69</td>
<td>1.12</td>
<td>1.02–1.23</td>
<td>0.02</td>
<td>0.43</td>
<td>2.33</td>
</tr>
<tr>
<td>Sexual Concerns</td>
<td>3.89</td>
<td>0.05</td>
<td>3.21</td>
<td>1.05</td>
<td>.99–1.12</td>
<td>0.07</td>
<td>0.65</td>
<td>1.54</td>
</tr>
</tbody>
</table>
victims (opposed to community victims) by a factor of 4.42. None of the other mental health variables were significantly predictive of victim type.

Table 39

*Mental Health Variables and Prediction of Victim Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of any MH diagnosis</td>
<td>0.81</td>
<td>-0.44</td>
<td>0.82</td>
<td>0.65</td>
<td>.25–1.66</td>
<td>0.36</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total number of MH diagnoses</td>
<td>0.9</td>
<td>-0.16</td>
<td>0.87</td>
<td>0.85</td>
<td>.61–1.19</td>
<td>0.35</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CD and/or ODD</td>
<td>4.29</td>
<td>-1.01</td>
<td>3.98</td>
<td>0.36</td>
<td>.14–0.98</td>
<td><strong>0.04</strong></td>
<td>0.92</td>
<td>1.09</td>
</tr>
<tr>
<td>ADHD</td>
<td>5.54</td>
<td>1.49</td>
<td>5.22</td>
<td>4.42</td>
<td>1.24–15.79</td>
<td><strong>0.02</strong></td>
<td>0.92</td>
<td>1.09</td>
</tr>
<tr>
<td>Substance disorder</td>
<td>1.93</td>
<td>-0.71</td>
<td>1.85</td>
<td>0.49</td>
<td>.18–1.36</td>
<td>0.17</td>
<td>0.92</td>
<td>1.09</td>
</tr>
<tr>
<td>Depression</td>
<td>0.56</td>
<td>-0.44</td>
<td>0.54</td>
<td>0.65</td>
<td>.20–2.07</td>
<td>0.46</td>
<td>0.79</td>
<td>1.26</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.27</td>
<td>-0.44</td>
<td>0.25</td>
<td>0.64</td>
<td>.12–3.54</td>
<td>0.61</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>PTSD</td>
<td>0.69</td>
<td>-0.53</td>
<td>0.66</td>
<td>0.59</td>
<td>.17–2.10</td>
<td>0.42</td>
<td>0.93</td>
<td>1.07</td>
</tr>
<tr>
<td>Psychosis</td>
<td>0.02</td>
<td>-0.11</td>
<td>0.019</td>
<td>0.89</td>
<td>.19–4.11</td>
<td>0.89</td>
<td>0.88</td>
<td>1.13</td>
</tr>
<tr>
<td>DSH</td>
<td>2.72</td>
<td>0.79</td>
<td>2.62</td>
<td>2.21</td>
<td>.84–5.78</td>
<td>0.11</td>
<td>0.88</td>
<td>1.13</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

Substance use history. As can be seen in Table 40, no substance use variables were significantly predictive of victim subtype.

Table 40

*Substance Use and Prediction of Victim Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total types of substance use</td>
<td>2.38</td>
<td>-0.37</td>
<td>2.27</td>
<td>0.69</td>
<td>.43–1.12</td>
<td>0.13</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cannabis</td>
<td>1.29</td>
<td>-0.68</td>
<td>1.3</td>
<td>0.51</td>
<td>.16–1.63</td>
<td>0.25</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Stimulants</td>
<td>0.02</td>
<td>0.068</td>
<td>0.02</td>
<td>1.07</td>
<td>.42–2.76</td>
<td>0.89</td>
<td>0.87</td>
<td>1.14</td>
</tr>
<tr>
<td>Other drugs</td>
<td>0.94</td>
<td>-0.51</td>
<td>0.912</td>
<td>0.6</td>
<td>.21–1.71</td>
<td>0.34</td>
<td>0.87</td>
<td>1.15</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

Maltreatment. As seen in Table 41, sexual abuse significantly predicted victim type (p < .05). A history of sexual abuse was associated with increased likelihood of having family victims, as indicated by the odds ratio above one. Having a history of sexual abuse was associated with an increase in the odds of having family victims by a factor of 2.68. None of the other maltreatment variables were significantly predictive of victim type.
Table 41

*Maltreatment History and Prediction of Victim Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of maltreatment</td>
<td>1.05</td>
<td>0.79</td>
<td>0.93</td>
<td>2.21</td>
<td>.44–11.02</td>
<td>0.33</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Number of maltreatment types</td>
<td>0.04</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.97</td>
<td>.72–1.30</td>
<td>0.84</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Witness violence</td>
<td>2.64</td>
<td>-0.83</td>
<td>2.57</td>
<td>0.44</td>
<td>.16–1.20</td>
<td>0.11</td>
<td>0.79</td>
<td>1.26</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>0.00</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.98</td>
<td>.36–2.71</td>
<td>0.97</td>
<td>0.79</td>
<td>1.27</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>4.60</td>
<td>0.99</td>
<td>4.32</td>
<td>2.68</td>
<td>1.06–6.78</td>
<td><strong>0.04</strong></td>
<td>0.96</td>
<td>1.04</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>0.99</td>
<td>0.49</td>
<td>0.98</td>
<td>1.64</td>
<td>.62–4.37</td>
<td>0.32</td>
<td>0.86</td>
<td>1.16</td>
</tr>
<tr>
<td>Neglect</td>
<td>1.96</td>
<td>-0.65</td>
<td>1.91</td>
<td>0.52</td>
<td>.21–1.31</td>
<td>0.52</td>
<td>0.96</td>
<td>1.04</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

**Developmental background.** As seen in Table 42, none of these variables were able to significantly predict victim type. However, the variables *cognitive impairment* and *poor social skills* indicated a trend towards significance. Both of these variables were associated with increased likelihood of having family victims, as indicated by the odds ratios above one. *Poor social skills* was associated with an increase in the odds of having family victims by a factor of 2.56. *Cognitive impairment* was associated with an increase in the odds of having family victims by a factor of 2.84.
Table 42

Developmental Variables and Prediction of Victim Subtype by Logistic Regression

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age when problem behaviours began</td>
<td>0.61</td>
<td>0.05</td>
<td>0.59</td>
<td>1.05</td>
<td>.92–1.20</td>
<td>0.44</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pregnancy stress</td>
<td>0.45</td>
<td>0.34</td>
<td>0.45</td>
<td>1.4</td>
<td>.52–3.78</td>
<td>0.5</td>
<td>0.87</td>
<td>1.14</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>3.34</td>
<td>1.05</td>
<td>3.31</td>
<td>2.84</td>
<td>.92–8.78</td>
<td>0.07</td>
<td>0.86</td>
<td>1.16</td>
</tr>
<tr>
<td>Anger problems</td>
<td>0.52</td>
<td>0.35</td>
<td>0.51</td>
<td>1.42</td>
<td>.54–3.71</td>
<td>0.47</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>Grief/bereavement issues</td>
<td>-0.02</td>
<td>-0.04</td>
<td>0</td>
<td>0.98</td>
<td>.27–3.60</td>
<td>0.98</td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>2.78</td>
<td>0.92</td>
<td>2.78</td>
<td>2.56</td>
<td>.85–7.70</td>
<td>0.09</td>
<td>0.93</td>
<td>1.08</td>
</tr>
<tr>
<td>ADHD type symptoms</td>
<td>0.06</td>
<td>0.13</td>
<td>0.07</td>
<td>1.14</td>
<td>.42–3.03</td>
<td>0.8</td>
<td>0.85</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

Family background. As can be seen in Table 43, having siblings involved in crime was associated with a decreased likelihood of having family victims (i.e., increased likelihood of community victims), as indicated by the odds ratio below one. The presence of sibling criminality was associated with an increase in odds for community victims by a factor of 5 (1/0.20).

Two other variables approached significance; parental incarceration and parental alcohol abuse. Parental incarceration was associated with a decreased likelihood of having family victims (increased likelihood of having community victims). The presence of parental incarceration was associated with an increase in the odds for community victims by a factor of 4.16 (1/0.24). Parental alcohol abuse was associated with an increased likelihood of having family victims (decreased likelihood of having community victims). The presence of parental alcohol abuse was associated with an increase in the odds for family victims by a factor of 0.24.
Table 43

*Family Background Variables and Prediction of Victim Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent status (Ref group: Together)</td>
<td></td>
<td>0.33</td>
<td>-0.31</td>
<td>0.33</td>
<td>0.73</td>
<td>0.25–2.14</td>
<td>0.57</td>
<td>0.96</td>
<td>1.05</td>
</tr>
<tr>
<td>Mother contact (Ref group: Some or close)</td>
<td></td>
<td>0.48</td>
<td>0.5</td>
<td>0.49</td>
<td>1.64</td>
<td>0.41–6.59</td>
<td>0.48</td>
<td>0.94</td>
<td>1.07</td>
</tr>
<tr>
<td>Father contact (Ref group: Some or close)</td>
<td></td>
<td>0.22</td>
<td>-0.24</td>
<td>0.22</td>
<td>0.79</td>
<td>0.29–2.13</td>
<td>0.64</td>
<td>0.93</td>
<td>1.08</td>
</tr>
<tr>
<td>Changes in caregiver</td>
<td>No changes</td>
<td>1.13</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.77*</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1 change</td>
<td>–</td>
<td>0.3</td>
<td>0.17</td>
<td>1.35</td>
<td>0.33–5.49</td>
<td>0.68</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2–4 changes</td>
<td>–</td>
<td>0.16</td>
<td>0.09</td>
<td>1.17</td>
<td>0.41–3.41</td>
<td>0.76</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CYF care history</td>
<td>0.01</td>
<td>0.043</td>
<td>0.01</td>
<td>1.04</td>
<td>0.41–2.62</td>
<td>0.93</td>
<td>0.94</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Parental criminality</td>
<td>0.08</td>
<td>0.17</td>
<td>0.08</td>
<td>1.18</td>
<td>0.38–3.70</td>
<td>0.77</td>
<td>0.55</td>
<td>1.82</td>
<td></td>
</tr>
<tr>
<td>Parental incarceration</td>
<td>3.12</td>
<td>-1.40</td>
<td>2.86</td>
<td>0.24</td>
<td>0.05–1.25</td>
<td>0.09</td>
<td>0.53</td>
<td>1.87</td>
<td></td>
</tr>
<tr>
<td>Sibling criminality</td>
<td>5.69</td>
<td>-1.63</td>
<td>4.81</td>
<td>0.20</td>
<td>0.05–0.84</td>
<td>0.03</td>
<td>0.77</td>
<td>1.29</td>
<td></td>
</tr>
<tr>
<td>History of MH problems in family</td>
<td>0.05</td>
<td>-0.11</td>
<td>0.05</td>
<td>0.90</td>
<td>0.32–2.46</td>
<td>0.83</td>
<td>0.88</td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td>Parental illicit drug abuse</td>
<td>1.37</td>
<td>-0.76</td>
<td>1.32</td>
<td>0.47</td>
<td>0.13–1.71</td>
<td>0.25</td>
<td>0.49</td>
<td>2.03</td>
<td></td>
</tr>
<tr>
<td>Parental alcohol abuse</td>
<td>3.10</td>
<td>1.10</td>
<td>2.89</td>
<td>3.02</td>
<td>0.85–10.76</td>
<td>0.09</td>
<td>0.53</td>
<td>1.9</td>
<td></td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

* This p-value is derived from the likelihood ratio tests (other p values derived from the Wald test)

**School background.** As can be seen in Table 44, the variable *school exclusions* was associated with a decreased likelihood of having family victims (an increased likelihood of having community victims), as indicated by the odds ratio below one. The presence of school exclusions was associated with an increase in the odds for community victims by a factor of 2.56 (1/0.39).

Three other variables approached significance; *school learning problems, truancy and number of schools*. The presence of school learning problems was associated with an increased likelihood of having family victims (decreased likelihood of having community victims), as
illustrated by the odds ratio above one. The variable *school learning problems* was associated with an increase in the odds for family victims by a factor of 2.16.

The presence of truancy was associated with decreased likelihood of family victims (increased likelihood for community victims), as indicated by the odds ratio below one. Truancy was associated with an increase in the odds for community victims by a factor of 3.03 (1/0.33).

In regards to number of schools attended, attending 3 or less schools, (i.e., one primary, intermediate and high school), was associated with an increased likelihood of having family victims (i.e., decreased likelihood of having community victims) compared to those attending 6 or more schools, as indicated by the odds ratio above 1. Attending 3 or less schools was associated with an increase in the odds of family victims by a factor of 3.6 (compared to those who attended 6 or more schools). There was no significant difference in the likelihood of family victims between the two other comparisons (i.e. between those who attended 3 or less schools and those who attended 4 or 5 schools and between those who attended 4 or 5 schools and those who attended 6 or more schools).

Table 44

**School Related Variables and Relationship to Victim Subtype**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LR(\chi^2)</th>
<th>(\beta)</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>(p)</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of schools</td>
<td>3.7</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.16*</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>(Reference: 6 or more)</td>
<td>3 or less</td>
<td>1.28</td>
<td>3.25</td>
<td>3.6</td>
<td>.89–14.51</td>
<td><strong>0.07</strong></td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>0.32</td>
<td>0.28</td>
<td>1.38</td>
<td>.42–4.75</td>
<td>0.59</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Learning problems</td>
<td>Yes</td>
<td>2.76</td>
<td>0.77</td>
<td>2.74</td>
<td>2.16</td>
<td>.87–5.42</td>
<td><strong>0.09</strong></td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>Behavioural problems</td>
<td>Yes</td>
<td>0.79</td>
<td>0.81</td>
<td>0.79</td>
<td>2.24</td>
<td>.38–13.33</td>
<td>0.37</td>
<td>0.64</td>
<td>1.57</td>
</tr>
<tr>
<td>Exclusions</td>
<td>Yes</td>
<td>4.09</td>
<td>-0.95</td>
<td>4.01</td>
<td>0.39</td>
<td>.15–.98</td>
<td><strong>0.04</strong></td>
<td>0.88</td>
<td>1.13</td>
</tr>
<tr>
<td>Truancy</td>
<td>Yes</td>
<td>3.45</td>
<td>-1.11</td>
<td>-1.11</td>
<td>0.33</td>
<td>.10–1.07</td>
<td><strong>0.06</strong></td>
<td>0.7</td>
<td>1.44</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.*

* This p-value is derived from the likelihood ratio tests (other p-values derived from the Wald test).

**Peer background and other problem behaviours.** As can be seen in Table 45, the variable *gang involvement* was significantly predictive of victim subtype. The variables *bullied, bully, and delinquent partner* indicated a trend towards significance (\(p < .10\)).

Gang involvement was associated with a decreased likelihood of having family victims (an increased likelihood of community victims), as indicated by the odds ratio below one. The
presence of gang involvement was associated with an increase in the odds for community violence by a factor of 6.66 (1/0.15).

Being a bully was associated with decreased likelihood of having family victims (increased likelihood for community victims), as indicated by the odds ratio below one. Being identified as a bully was associated with an increase in the odds for community victims by a factor of 3.33 (1/0.3).

A history of being bullied was associated with an increased likelihood of having family victims (decreased likelihood of community victims), as indicated by the odds ratio above one. Having a history of being bullied was associated with an increase in the odds for family victims by a factor of 2.81.

Having a delinquent partner was also associated with a decreased likelihood of having family victims (an increased likelihood of community victims), as indicated by the odds ratio below one. Having a delinquent partner was associated with an increase likelihood of community victims by a factor of 2.94 (1/0.34).

Table 45

*Peer and Other Problem Behaviours and Prediction of Victim Subtype by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullied</td>
<td>3.46</td>
<td>1.03</td>
<td>3.32</td>
<td>2.81</td>
<td>.92–8.52</td>
<td><strong>0.07</strong></td>
<td>0.91</td>
<td>1.1</td>
</tr>
<tr>
<td>Bully</td>
<td>3.89</td>
<td>-1.2</td>
<td>3.49</td>
<td>0.3</td>
<td>.09–1.06</td>
<td><strong>0.06</strong></td>
<td>0.92</td>
<td>1.08</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>5.82</td>
<td>-1.87</td>
<td>4.56</td>
<td>0.154</td>
<td>.03–8.6</td>
<td><strong>0.03</strong></td>
<td>0.84</td>
<td>1.19</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>3.99</td>
<td>-1.07</td>
<td>3.75</td>
<td>0.34</td>
<td>.12–1.01</td>
<td><strong>0.05</strong></td>
<td>0.92</td>
<td>1.08</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>1.79</td>
<td>-1.32</td>
<td>1.4</td>
<td>0.27</td>
<td>.03–2.39</td>
<td>0.24</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Prostitution</td>
<td>0.127</td>
<td>0.34</td>
<td>0.13</td>
<td>1.41</td>
<td>.21–9.27</td>
<td>0.72</td>
<td>0.91</td>
<td>1.1</td>
</tr>
<tr>
<td>Ran away</td>
<td>1.52</td>
<td>0.65</td>
<td>1.48</td>
<td>1.92</td>
<td>.67–5.48</td>
<td>0.22</td>
<td>0.94</td>
<td>1.06</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

**Combined Model of Psychosocial Variables**

The previous analyses investigated the effects of predictor variables within domains; the current analysis provided a predictive model across all mental health and psychosocial domains to predict victim subtype. Predictor variables selected for this analysis were determined by the results of the Wald tests from the domain by domain analyses. Variables with a \( p \leq .10 \) were retained in the current analysis. This included the variables *CD and/or ODD, ADHD, sexual abuse, cognitive impairment, poor social skills, parental incarceration, parental alcohol abuse, sibling criminality, learning problems, exclusions, truancy, number of schools, bullied, bully, gang involvement, and delinquent partner*. The variable *number of schools* was excluded because
of the reduced sample size that had this variable available (86 cases). In order to provide more
detail of these variables, the raw frequencies of these variables across the two victim subtypes
are presented in Table 46.

Table 46

Frequencies of the Predictor Variables Across Family and Community Victims, and Chi Square
Results Testing for Significant Differences

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Family (n, %)</th>
<th>Community (n, %)</th>
<th>$\chi^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD and/or ODD</td>
<td>11 (32.4)</td>
<td>34 (51.5)</td>
<td>3.33</td>
<td>0.07</td>
</tr>
<tr>
<td>ADHD</td>
<td>9 (26.5)</td>
<td>6 (9.1)</td>
<td>5.31</td>
<td>0.02</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>23 (67.6)</td>
<td>33 (50)</td>
<td>2.83</td>
<td>0.09</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>11 (32.4)</td>
<td>8 (12.1)</td>
<td>5.96</td>
<td>0.02</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>10 (29.4)</td>
<td>9 (13.6)</td>
<td>3.63</td>
<td>0.06</td>
</tr>
<tr>
<td>Parental incarceration</td>
<td>3 (8.8)</td>
<td>20 (30.3)</td>
<td>5.85</td>
<td>0.02</td>
</tr>
<tr>
<td>Parental alcohol abuse</td>
<td>16 (47.1)</td>
<td>32 (48.5)</td>
<td>0.02</td>
<td>0.89</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td>3 (8.8)</td>
<td>9 (28.8)</td>
<td>5.21</td>
<td>0.02</td>
</tr>
<tr>
<td>School learning problems</td>
<td>15 (44.1)</td>
<td>19 (28.8)</td>
<td>2.35</td>
<td>0.13</td>
</tr>
<tr>
<td>School exclusions</td>
<td>13 (38.2)</td>
<td>40 (60.6)</td>
<td>4.51</td>
<td>0.03</td>
</tr>
<tr>
<td>Truancy</td>
<td>22 (64.7)</td>
<td>53 (80.3)</td>
<td>2.91</td>
<td>0.09</td>
</tr>
<tr>
<td>Bullied</td>
<td>13 (38.2)</td>
<td>14 (21.2)</td>
<td>3.29</td>
<td>0.07</td>
</tr>
<tr>
<td>Bully</td>
<td>4 (11.8)</td>
<td>26 (39.4)</td>
<td>8.16</td>
<td>0.004</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>2 (5.9)</td>
<td>20 (30.3)</td>
<td>7.79</td>
<td>0.01</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>7 (20.6)</td>
<td>29 (43.9)</td>
<td>5.31</td>
<td>0.02</td>
</tr>
</tbody>
</table>

The results of the initial combined regression model can be seen in Table 47, as demonstrated in
the table, sibling criminality and school exclusions were the only variables with a p-value less
than .10.
### Table 47

**Prediction of Victim Subtype by Psychosocial Variables: Initial Logistic Regression Model**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD and/or ODD</td>
<td>1.60</td>
<td>-0.90</td>
<td>1.52</td>
<td>0.41</td>
<td>.10–1.70</td>
<td>0.22</td>
<td>0.71</td>
<td>1.40</td>
</tr>
<tr>
<td>ADHD</td>
<td>1.93</td>
<td>1.17</td>
<td>1.90</td>
<td>3.24</td>
<td>.94–20.01</td>
<td>0.22</td>
<td>0.74</td>
<td>1.34</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>2.75</td>
<td>1.03</td>
<td>2.61</td>
<td>2.81</td>
<td>.80–9.83</td>
<td>0.11</td>
<td>0.91</td>
<td>1.09</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>1.37</td>
<td>1.04</td>
<td>1.34</td>
<td>2.83</td>
<td>.48–16.51</td>
<td>0.25</td>
<td>0.58</td>
<td>1.73</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>0.81</td>
<td>0.70</td>
<td>0.80</td>
<td>2.00</td>
<td>.44–9.17</td>
<td>0.37</td>
<td>0.78</td>
<td>1.27</td>
</tr>
<tr>
<td>Parental incarceration</td>
<td>1.62</td>
<td>-1.00</td>
<td>1.50</td>
<td>0.37</td>
<td>.07–1.82</td>
<td>0.22</td>
<td>0.81</td>
<td>1.23</td>
</tr>
<tr>
<td>Parental alcohol abuse</td>
<td>2.27</td>
<td>0.96</td>
<td>2.16</td>
<td>2.60</td>
<td>.73–9.33</td>
<td>0.14</td>
<td>0.69</td>
<td>1.45</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td>3.52</td>
<td>-1.51</td>
<td>3.16</td>
<td>0.22</td>
<td>.04–1.16</td>
<td><strong>0.08</strong></td>
<td>0.73</td>
<td>1.36</td>
</tr>
<tr>
<td>School learning problems</td>
<td>0.12</td>
<td>-0.28</td>
<td>0.12</td>
<td>0.76</td>
<td>.16–3.62</td>
<td>0.73</td>
<td>0.56</td>
<td>1.78</td>
</tr>
<tr>
<td>School exclusions</td>
<td>3.70</td>
<td>-1.21</td>
<td>3.42</td>
<td>0.30</td>
<td>.08–1.08</td>
<td><strong>0.06</strong></td>
<td>0.77</td>
<td>1.29</td>
</tr>
<tr>
<td>Truancy</td>
<td>0.12</td>
<td>-0.24</td>
<td>0.12</td>
<td>0.79</td>
<td>.20–3.11</td>
<td>0.72</td>
<td>0.76</td>
<td>1.31</td>
</tr>
<tr>
<td>Bullied</td>
<td>2.19</td>
<td>1.01</td>
<td>2.12</td>
<td>2.76</td>
<td>.70–10.82</td>
<td>0.15</td>
<td>0.76</td>
<td>1.31</td>
</tr>
<tr>
<td>Bully</td>
<td>0.66</td>
<td>-0.60</td>
<td>0.64</td>
<td>0.55</td>
<td>.12–2.40</td>
<td>0.42</td>
<td>0.79</td>
<td>1.25</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>3.16</td>
<td>-1.69</td>
<td>2.67</td>
<td>0.19</td>
<td>.02–1.40</td>
<td>0.10</td>
<td>0.74</td>
<td>1.35</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>2.80</td>
<td>-1.07</td>
<td>2.62</td>
<td>0.34</td>
<td>.09–1.26</td>
<td>0.11</td>
<td>0.79</td>
<td>1.26</td>
</tr>
</tbody>
</table>

**Note.** LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
Nagelkerke’s $R^2 = .49$. Classification accuracy = 79%.

The next step involved removing the other variables from the model one by one, with the highest p-value first, to see if this impacted on the significance of other variables. Depending on each analysis, the next redundant variable was removed (highest p-value) one at a time until all variables had a $p \leq .10$. The variables were removed in 8 steps, (1) school learning problems, (2) truancy, (3) bully, (4) poor social skills, (5) ADHD, (6) CD and/or ODD, (7) parental alcohol abuse, and (8) parental incarceration. For succinctness the results of each of these analyses are not presented. This left a final model with seven variables, see Table 48. The variables school exclusions, bullied and gang involvement were significantly predictive at the $p \leq .05$ level. The variables sexual abuse, sibling criminality, cognitive impairment and delinquent partner approached significance ($p < .10$).

Of these variables, the presence of sexual abuse, cognitive impairment and bullied were associated with an increased likelihood of having family victims (opposed to community victims), as indicated by the odds ratios above one.
Having a history of sexual abuse was associated with an increase in the odds for family victims by a factor of 2.65. Having a history of cognitive impairment was associated with an increase in the odds for family victims by a factor of 3.03. Having a history of being bullied was associated with an increase in the odds for family victims by a factor of 4.38.

The remaining variables; sibling criminality, school exclusions, gang involvement and delinquent partner were associated with an increased likelihood of having community victims.

Sibling criminality was associated with an increase likelihood of community victims by a factor of 4 (1/0.25). Having a history of school exclusions was associated with an increased likelihood of community victims by a factor of 4.76 (1/0.21). Having a history of gang involvement was associated with an increase likelihood of community victims by a factor of 9.09 (1/0.11). Having a delinquent partner was associated with an increase likelihood of community victims by a factor of 2.94 (1/0.34).

Table 48

Prediction of Victim Subtype by Psychosocial Variables: Final Logistic Regression Model

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual abuse</td>
<td>3.38</td>
<td>0.97</td>
<td>3.23</td>
<td>2.65</td>
<td>0.91–7.64</td>
<td>0.07</td>
<td>0.96</td>
<td>1.04</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>3.05</td>
<td>1.11</td>
<td>2.95</td>
<td>3.03</td>
<td>0.86–10.75</td>
<td>0.09</td>
<td>0.93</td>
<td>1.08</td>
</tr>
<tr>
<td>Sibling crime</td>
<td>3.71</td>
<td>-1.4</td>
<td>3.19</td>
<td>0.25</td>
<td>0.05–1.14</td>
<td>0.07</td>
<td>0.9</td>
<td>1.11</td>
</tr>
<tr>
<td>School exclusions</td>
<td>8.94</td>
<td>-1.58</td>
<td>7.84</td>
<td>0.21</td>
<td>0.07–0.62</td>
<td>0.005</td>
<td>0.96</td>
<td>1.04</td>
</tr>
<tr>
<td>Bullied</td>
<td>6.01</td>
<td>1.48</td>
<td>5.57</td>
<td>4.38</td>
<td>1.29–14.97</td>
<td>0.02</td>
<td>0.91</td>
<td>1.1</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>7.37</td>
<td>-2.22</td>
<td>5.42</td>
<td>0.11</td>
<td>0.02–0.70</td>
<td>0.02</td>
<td>0.87</td>
<td>1.15</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>3.78</td>
<td>-1.08</td>
<td>3.54</td>
<td>0.34</td>
<td>0.11–1.05</td>
<td>0.06</td>
<td>0.91</td>
<td>1.095</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
Nagelkerke’s $R^2$ = .42. Classification accuracy = 76%.

Summary of Section Five: Can We Predict Victim Type?

This section reported the demographic, psychosocial, offence related and trauma symptom correlates of family and community victims. Of the demographic variables, ethnicity was significantly predictive of victim subtype. Māori youth were associated with increased likelihood of victimising community members whereas Pākehā youth were associated with increased likelihood of victimising family members.

Of the offence related variables, peer involvement in the offence was associated with an increased likelihood of victimising community members. Violence motivation subtype was also significantly predictive of victim subtype. Reactive violence was associated with an increased likelihood of family victims, and instrumental violence was associated with an increased
likelihood of community victims. Victim age was also significantly predictive of victim subtype. Having youth/child aged victims was associated with increased likelihood of community victims, and having adult victims was associated with increased likelihood of having family victims.

Of the TSCC scales, Anxiety, Anger and Sexual Concerns indicated a trend towards significance (p < .10), and the Dissociation scale was significant at the p < .05 level of significance. The Sexual Concerns scale and the Dissociation scale were associated with increased likelihood of family victims. The Anxiety and Anger scales were associated with increased likelihood of community victims.

In the combined psychosocial logistic regression analysis (which combined the variables significant at the p < .10 level of significance in the domain by domain analyses), the variables school exclusions, bullied and gang involvement were significantly predictive at the p < .05 level. The variables sexual abuse, sibling criminality, cognitive impairment and delinquent partner approached significance (p < .10).

Of these variables, the presence of sexual abuse, cognitive impairment and bullied were associated with an increased likelihood of victimising family members. The variables; sibling criminality, school exclusions, gang involvement and delinquent partner were associated with an increased likelihood of victimising community members.

Section Six: Ethnicity and its Correlates

The final aim of this thesis was to determine what demographic variables, background psychosocial variables, offence characteristics, and TSCC scales scores were predictive of ethnicity; Māori (n = 68) or Pākehā (n = 28).

The methodology used to investigate these relationships was identical to the approach used in the previous section, but with ethnicity (Māori or Pākehā) as the outcome variable in the logistic regression analyses. Where identical, the methodology will not be repeated here.

For all logistic regression analyses, Pākehā was used as the reference group.

Demographic Variables
The logistic regression analysis demonstrated that age at time of offence and quintile score were not predictive of ethnicity, as can be seen in Table 49.
Table 49

**Demographic Variables and Prediction of Ethnicity by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at time of offence</td>
<td></td>
<td>0.5</td>
<td>.195</td>
<td>.492</td>
<td>1.216</td>
<td>.70–2.10</td>
<td>0.483</td>
<td>0.99</td>
<td>1.01</td>
</tr>
<tr>
<td>SED quintile</td>
<td></td>
<td>2.08</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>.722*</td>
<td>0.99</td>
<td>1.01</td>
</tr>
<tr>
<td>SED quintile (reference quintile = 5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>-0.745</td>
<td>1.465</td>
<td>.475</td>
<td>.14–1.58</td>
<td>.226</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>.126</td>
<td>.020</td>
<td>1.134</td>
<td>.20–6.39</td>
<td>.886</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>-0.070</td>
<td>.010</td>
<td>.933</td>
<td>.24–3.63</td>
<td>.920</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>-0.560</td>
<td>.703</td>
<td>.571</td>
<td>.15–2.12</td>
<td>.402</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.  
*a This p-value is derived from the likelihood ratio test, all other p-values presented are from the Wald test.

**Offence Related Variables**

The offence related variables: *intoxication at the time of offence, peer involvement in index offence, victim subtype, violence subtype, victim age and victim sex* were entered into one logistic regression analysis. The results of this analysis are displayed in Table 50.

Table 50

**Offence Characteristics in the Prediction of Ethnicity by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intoxication at the time of offence</td>
<td>3.69</td>
<td>1.29</td>
<td>3.18</td>
<td>3.64</td>
<td>.88–15.06</td>
<td><strong>0.07</strong></td>
<td>0.93</td>
<td>1.07</td>
</tr>
<tr>
<td>Peers involvement in index offence</td>
<td>0.31</td>
<td>0.39</td>
<td>0.31</td>
<td>1.47</td>
<td>.38–5.75</td>
<td>0.57</td>
<td>0.59</td>
<td>1.69</td>
</tr>
<tr>
<td>Victim subtype (Ref group: CV)</td>
<td>3.88</td>
<td>-1.46</td>
<td>3.64</td>
<td>0.23</td>
<td>.05–1.04</td>
<td><strong>0.06</strong></td>
<td>0.49</td>
<td>2.01</td>
</tr>
<tr>
<td>Violence subtype (Ref group: Instrumental)</td>
<td>0.28</td>
<td>-0.38</td>
<td>0.28</td>
<td>0.68</td>
<td>.17–2.80</td>
<td>0.84</td>
<td>0.78</td>
<td>1.27</td>
</tr>
<tr>
<td>Victim age (Ref group: Adult)</td>
<td>0.04</td>
<td>-0.13</td>
<td>0.04</td>
<td>0.87</td>
<td>.24–3.17</td>
<td>0.61</td>
<td>0.92</td>
<td>1.09</td>
</tr>
<tr>
<td>Victim sex (Ref group: Female)</td>
<td>0.27</td>
<td>-0.3</td>
<td>0.27</td>
<td>0.74</td>
<td>.24–2.31</td>
<td>0.60</td>
<td>0.62</td>
<td>1.61</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval; CV = Community victims.

The next step involved removing the redundant variables from the model one at a time. This resulted in a final logistic regression model, which is presented in Table 51.
Intoxication at the time of the offence was associated with an increased likelihood of Māori ethnicity (decreased likelihood of Pākehā ethnicity), as indicated by the odds ratio above one. Intoxication at the time of the index offence was associated with an increase in the odds of Māori ethnicity by a factor of 3.49.

The victim subtype category of family victims was associated with decreased likelihood of Māori ethnicity (increased likelihood of Pākehā ethnicity), as indicated by the odds ratio below one. Having family victims increased the odds of Pākehā ethnicity by a factor of 5.56 (1/0.18). Conversely, having community victims increased the odds of Māori ethnicity by a factor of 5.56 (exp(-1.67)).

Table 51

**Final Model of Offence Related Characteristics and Prediction of Ethnicity by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intoxication at the time of offence</td>
<td>3.67</td>
<td>1.25</td>
<td>3.22</td>
<td>3.49</td>
<td>0.89–13.68</td>
<td><strong>0.07</strong></td>
<td>0.95</td>
<td>1.04</td>
</tr>
<tr>
<td>Victim subtype (Ref group: CV)</td>
<td>10.83</td>
<td>-1.67</td>
<td>10.33</td>
<td>0.18</td>
<td>0.07–0.52</td>
<td><strong>0.001</strong></td>
<td>0.95</td>
<td>1.04</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval; CV = Community victims.
Nagelkerke’s $R^2 = .25$. Classification accuracy = 77%.

The following raw frequencies and percentages provide further detail about these associations.

Of the Māori youth, 37% were coded as being intoxicated at the time of their offence compared to 11% of the Pākehā youth, this difference in proportions was significant, $\chi^2 (1, n = 96) = 6.51, p = .01$.

Of the Māori youth, 81% were coded as having community victims, compared to 41% of the Pākehā youth. Of the Māori youth 19% were coded as having family victims compared to 59% of the Pākehā youth. The differences in these proportions were significant, $\chi^2 (1, n = 90) = 14.26, p < .000$.

**VAS scores.** The Mann–Whitney $U$ test was used to determine differences between the two ethnic groups. The Mann–Whitney $U$ test indicated that the distribution of VAS scores was the same across the ethnic groups, Māori $Mdn = 60$ ($SD = 9.30$), Pākehā $Mdn = 60$ ($SD = 7.98$), $U = 872.00, p = .747$.  

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The Trauma Symptom Checklist

TSCC scores were available and valid for 61 of the violent youth (58%). However, this analysis used a sample of 56, as only 56 of these were able to be coded for ethnicity. Of these TSCC scores, 14 (25%) were for Pākehā youth and 42 (75%) were for Māori youth.

The TSCC scales were entered into one logistic regression analysis. As can be seen in Table 52, none of the TSCC scales were predictive of ethnicity.

Table 52

<table>
<thead>
<tr>
<th>TSCC scale</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>1.05</td>
<td>0.08</td>
<td>0.99</td>
<td>1.08</td>
<td>.92–1.25</td>
<td>0.32</td>
<td>0.24</td>
<td>4.26</td>
</tr>
<tr>
<td>Depression</td>
<td>2.66</td>
<td>-0.09</td>
<td>2.40</td>
<td>0.91</td>
<td>.81–1.02</td>
<td>0.12</td>
<td>0.31</td>
<td>3.17</td>
</tr>
<tr>
<td>Anger</td>
<td>2.13</td>
<td>0.08</td>
<td>1.93</td>
<td>1.08</td>
<td>.97–1.21</td>
<td>0.16</td>
<td>0.45</td>
<td>2.21</td>
</tr>
<tr>
<td>Posttraumatic stress</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td>.89–1.12</td>
<td>0.99</td>
<td>0.24</td>
<td>4.20</td>
</tr>
<tr>
<td>Dissociation</td>
<td>0.85</td>
<td>-0.05</td>
<td>0.82</td>
<td>0.95</td>
<td>.86–1.06</td>
<td>0.36</td>
<td>0.29</td>
<td>3.43</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>0.02</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.99</td>
<td>.93–1.06</td>
<td>0.88</td>
<td>0.58</td>
<td>1.73</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

Background Psychosocial Variables

Mental health problems. As can be seen in Table 53, having a diagnosis of ADHD was associated with a decreased likelihood of Māori ethnicity (increased likelihood of Pākehā ethnicity), as indicated by the odds ratio below one. The presence of an ADHD diagnosis was associated with an increase in the odds for Pākehā ethnicity by a factor of 3.57 (1/0.28).

Having a diagnosis of a substance use disorder was associated with an increased likelihood of Māori ethnicity (decreased likelihood of Pākehā ethnicity), as indicated by the odds ratio above one. The presence of a substance use disorder was associated with an increase in the odds for Māori ethnicity by a factor of 5.92.
Table 53

Mental Health Variables and Prediction of Ethnicity by Logistic Regression

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\chi^2$</th>
<th>$\beta$</th>
<th>Wald</th>
<th>$OR$</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of any MH diagnosis</td>
<td>0.02</td>
<td>-0.10</td>
<td>0.02</td>
<td>0.91</td>
<td>0.22–3.68</td>
<td>0.89</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total number of MH diagnoses</td>
<td>1.14</td>
<td>0.27</td>
<td>1.07</td>
<td>1.32</td>
<td>0.78–2.22</td>
<td>0.30</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CD and/or OD</td>
<td>0.77</td>
<td>0.45</td>
<td>0.76</td>
<td>1.57</td>
<td>0.57–4.33</td>
<td>0.38</td>
<td>0.94</td>
<td>1.07</td>
</tr>
<tr>
<td>ADHD</td>
<td>3.83</td>
<td>-1.26</td>
<td>3.70</td>
<td>0.28</td>
<td>0.08–1.02</td>
<td><strong>0.05</strong></td>
<td>0.93</td>
<td>1.07</td>
</tr>
<tr>
<td>Substance disorder</td>
<td>9.01</td>
<td>1.78</td>
<td>6.99</td>
<td>5.92</td>
<td>1.58–22.13</td>
<td><strong>0.01</strong></td>
<td>0.92</td>
<td>1.09</td>
</tr>
<tr>
<td>Depression</td>
<td>0.29</td>
<td>0.35</td>
<td>0.29</td>
<td>1.41</td>
<td>0.39–5.01</td>
<td>0.59</td>
<td>0.75</td>
<td>1.32</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.42</td>
<td>-0.53</td>
<td>0.44</td>
<td>0.59</td>
<td>0.12–2.81</td>
<td>0.51</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>PTSD</td>
<td>0.64</td>
<td>0.55</td>
<td>0.60</td>
<td>1.73</td>
<td>0.43–6.99</td>
<td>0.44</td>
<td>0.92</td>
<td>1.08</td>
</tr>
<tr>
<td>Psychosis</td>
<td>0.13</td>
<td>0.32</td>
<td>0.13</td>
<td>1.38</td>
<td>0.24–8.05</td>
<td>0.72</td>
<td>0.86</td>
<td>1.17</td>
</tr>
<tr>
<td>DSH</td>
<td>0.45</td>
<td>-0.33</td>
<td>0.45</td>
<td>0.72</td>
<td>0.27–1.91</td>
<td>0.50</td>
<td>0.86</td>
<td>1.17</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

Substance use history. As can be seen in Table 54, having experimented with a higher number of total substance types was associated with increased likelihood of Māori ethnicity (decreased likelihood of Pākehā ethnicity). This is demonstrated by the odds ratios above one. For each additional substance type experimented with, the associated odds of Māori ethnicity increased by a factor of 1.94.

Having a history of using drugs that fall in the other drugs category indicated a trend towards significance and was associated with an increased likelihood of Māori ethnicity, and was associated with an increase in the odds of Māori ethnicity by a factor of 3.09.

Table 54

Substance Use and Prediction of Ethnicity by Logistic Regression

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\chi^2$</th>
<th>$B$</th>
<th>Wald</th>
<th>$OR$</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total types of substance use</td>
<td>6.07</td>
<td>0.66</td>
<td>5.35</td>
<td>1.94</td>
<td>1.11–3.42</td>
<td><strong>0.02</strong></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cannabis</td>
<td>0.66</td>
<td>0.55</td>
<td>0.67</td>
<td>1.73</td>
<td>0.46–6.49</td>
<td>0.41</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Stimulants</td>
<td>0.14</td>
<td>0.20</td>
<td>0.14</td>
<td>1.22</td>
<td>0.42–3.51</td>
<td>0.71</td>
<td>0.89</td>
<td>1.13</td>
</tr>
<tr>
<td>Other drugs</td>
<td>3.78</td>
<td>1.13</td>
<td>3.32</td>
<td>3.09</td>
<td>0.92–10.36</td>
<td><strong>0.07</strong></td>
<td>0.89</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
Maltreatment. As seen in Table 55, the variable witnessing violence was associated with an increased likelihood of Māori ethnicity (decreased likelihood of Pākehā ethnicity), as indicated by the odds ratio above one. Witnessing violence was associated with an increase in the odds of Māori ethnicity by a factor of 2.84.

Table 55

Maltreatment History and Prediction of Ethnicity by Logistic Regression

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>B</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of maltreatment</td>
<td>0.24</td>
<td>1.25</td>
<td>0.23</td>
<td>0.67</td>
<td>.13–3.45</td>
<td>0.63</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Number of maltreatment types</td>
<td>0.56</td>
<td>0.12</td>
<td>0.56</td>
<td>1.13</td>
<td>.82–1.55</td>
<td>0.46</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Witness violence</td>
<td>3.78</td>
<td>1.05</td>
<td>3.68</td>
<td>2.84</td>
<td>.97–8.27</td>
<td><strong>0.05</strong></td>
<td>0.80</td>
<td>1.25</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>2.37</td>
<td>0.84</td>
<td>2.34</td>
<td>2.31</td>
<td>.79–6.76</td>
<td>0.13</td>
<td>0.80</td>
<td>1.25</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>0.27</td>
<td>-0.26</td>
<td>0.27</td>
<td>0.77</td>
<td>.29–2.04</td>
<td>0.61</td>
<td>0.94</td>
<td>1.07</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>1.92</td>
<td>-0.75</td>
<td>1.87</td>
<td>0.47</td>
<td>.16–1.38</td>
<td>0.17</td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Neglect</td>
<td>1.52</td>
<td>-0.60</td>
<td>1.50</td>
<td>0.55</td>
<td>.21–1.43</td>
<td>0.22</td>
<td>0.86</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

Developmental background. As seen in Table 56, the variables anger problems, poor social skills, and hyperactivity/impulsivity were associated with decreased likelihood of Māori ethnicity (increased likelihood of Pākehā ethnicity), as indicated by the odds ratios below one. Having anger problems, poor social skills or hyperactivity/impulsivity problems increased the odds of Pākehā ethnicity by factors of 3.33 (1/0.3), 5.26 (1/0.19), and 3.03 (1/0.33) respectively.

The variable pregnancy stress approached significance and was associated with increased likelihood of Māori ethnicity (decreased likelihood of Pākehā ethnicity), as indicated by the odds ratio above one. Stress during pregnancy was associated with an increase in the odds of Māori ethnicity by a factor of 3.05.
Table 56

Developmental Variables and Prediction of Ethnicity by Logistic Regression

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age when problem behaviours began</td>
<td>2.72</td>
<td>0.11</td>
<td>2.73</td>
<td>1.12</td>
<td>.98–1.27</td>
<td>0.12</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pregnancy stress</td>
<td>3.30</td>
<td>1.12</td>
<td>2.98</td>
<td>3.05</td>
<td>.86–10.84</td>
<td>0.08</td>
<td>0.87</td>
<td>1.15</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>0.00</td>
<td>-0.04</td>
<td>0.00</td>
<td>0.96</td>
<td>.25–3.70</td>
<td>0.95</td>
<td>0.85</td>
<td>1.17</td>
</tr>
<tr>
<td>Anger problems</td>
<td>4.23</td>
<td>-1.22</td>
<td>3.69</td>
<td>0.30</td>
<td>.86–1.02</td>
<td><strong>0.05</strong></td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>Grief/bereavement issues</td>
<td>1.14</td>
<td>-0.71</td>
<td>1.16</td>
<td>0.49</td>
<td>.13–1.79</td>
<td>0.28</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>6.72</td>
<td>-1.64</td>
<td>6.37</td>
<td>0.19</td>
<td>.06–6.9</td>
<td><strong>0.01</strong></td>
<td>0.91</td>
<td>1.10</td>
</tr>
<tr>
<td>ADHD type symptoms</td>
<td>4.27</td>
<td>-1.12</td>
<td>4.20</td>
<td>0.33</td>
<td>.11–9.5</td>
<td><strong>0.04</strong></td>
<td>0.88</td>
<td>1.13</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

**Family background.** As can be seen in Table 57, *sibling criminality* was the only variable that was able to significantly predict ethnicity. It was associated with an increased likelihood of Māori ethnicity, as indicated by the odds ratio above one. The presence of sibling criminality was associated with an increase in the odds of Māori ethnicity by a factor of 10.21.

The variable *mother contact* approached significance. It was associated with an increased likelihood of Pākehā ethnicity, as indicated by the odds ratio below one. Having minimal or no mother contact (as opposed to some or close contact) was associated with an increase in the odds of Pākehā ethnicity by a factor of 3.57 (1/0.28).
Table 57

*Family Variables and Prediction of Ethnicity by Logistic Regression*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent status (Ref group: Together)</td>
<td></td>
<td>0.03</td>
<td>-0.12</td>
<td>0.03</td>
<td>0.89</td>
<td>.26–3.04</td>
<td>0.86</td>
<td>0.97</td>
<td>1.02</td>
</tr>
<tr>
<td>Mother contact (Ref group: Some or close)</td>
<td></td>
<td>3.02</td>
<td>-1.27</td>
<td>3.01</td>
<td>0.28</td>
<td>.07–1.18</td>
<td><strong>0.08</strong></td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td>Father contact (Ref group: Some or close)</td>
<td></td>
<td>0.13</td>
<td>0.18</td>
<td>0.13</td>
<td>1.2</td>
<td>.44–3.30</td>
<td>0.72</td>
<td>0.98</td>
<td>1.03</td>
</tr>
<tr>
<td>Changes in caregiver</td>
<td>No changes</td>
<td>0.64</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>(Reference: 5 or more changes)</td>
<td>1 change</td>
<td>–</td>
<td>0.34</td>
<td>0.19</td>
<td>1.41</td>
<td>.29–6.77</td>
<td>0.66</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2–4 changes</td>
<td>–</td>
<td>0.30</td>
<td>0.32</td>
<td>1.34</td>
<td>.47–3.77</td>
<td>0.58</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CYF care history</td>
<td></td>
<td>0.04</td>
<td>-0.10</td>
<td>0.04</td>
<td>0.91</td>
<td>.33–2.45</td>
<td>0.84</td>
<td>0.92</td>
<td>1.08</td>
</tr>
<tr>
<td>Parental criminality</td>
<td></td>
<td>0.00</td>
<td>0.04</td>
<td>0.00</td>
<td>1.04</td>
<td>.28–3.84</td>
<td>0.95</td>
<td>0.52</td>
<td>1.91</td>
</tr>
<tr>
<td>Parental incarceration</td>
<td></td>
<td>0.40</td>
<td>0.57</td>
<td>0.40</td>
<td>1.77</td>
<td>.30–10.46</td>
<td>0.52</td>
<td>0.53</td>
<td>1.89</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td></td>
<td>7.36</td>
<td>2.32</td>
<td>4.54</td>
<td>10.21</td>
<td>1.21–8.51</td>
<td><strong>0.03</strong></td>
<td>0.81</td>
<td>1.23</td>
</tr>
<tr>
<td>History of MH problems in family</td>
<td></td>
<td>0.09</td>
<td>0.16</td>
<td>0.09</td>
<td>1.17</td>
<td>.41–3.34</td>
<td>0.77</td>
<td>0.94</td>
<td>1.06</td>
</tr>
<tr>
<td>Parental illicit drug abuse</td>
<td></td>
<td>2.30</td>
<td>1.07</td>
<td>2.17</td>
<td>2.92</td>
<td>0.70–12.20</td>
<td>0.14</td>
<td>0.48</td>
<td>2.09</td>
</tr>
<tr>
<td>Parental alcohol abuse</td>
<td></td>
<td>0.24</td>
<td>-0.31</td>
<td>0.24</td>
<td>0.74</td>
<td>.21–2.51</td>
<td>0.62</td>
<td>0.57</td>
<td>1.75</td>
</tr>
</tbody>
</table>

*Note.* LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

*This p-value is derived from the likelihood ratio tests (other p values derived from the Wald test).*

**School background.** As can be seen in Table 58, none of the school background variables were significantly predictive of ethnicity.
Table 58

**School Related Variables and Prediction of Ethnicity by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Category</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of schools</td>
<td></td>
<td>0.23</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
<td>0.89*</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>(Reference: 6 or more)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 or less</td>
<td>0.20</td>
<td>0.07</td>
<td>1.22</td>
<td>0.28–5.26</td>
<td>0.79</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>-0.11</td>
<td>0.04</td>
<td>0.89</td>
<td>0.29–2.79</td>
<td>0.85</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Learning problems</td>
<td>Yes</td>
<td>0.07</td>
<td>0.13</td>
<td>0.07</td>
<td>1.14</td>
<td>0.44–2.94</td>
<td>0.79</td>
<td>0.99</td>
<td>1.01</td>
</tr>
<tr>
<td>Behavioural problems</td>
<td>Yes</td>
<td>0.00</td>
<td>-0.03</td>
<td>0.00</td>
<td>0.97</td>
<td>0.15–6.26</td>
<td>0.97</td>
<td>0.66</td>
<td>1.51</td>
</tr>
<tr>
<td>Exclusions</td>
<td>Yes</td>
<td>1.15</td>
<td>0.51</td>
<td>1.15</td>
<td>1.67</td>
<td>0.65–4.25</td>
<td>0.28</td>
<td>0.90</td>
<td>1.11</td>
</tr>
<tr>
<td>Prevalent truancy</td>
<td>Yes</td>
<td>0.10</td>
<td>0.19</td>
<td>0.10</td>
<td>1.21</td>
<td>0.37–3.98</td>
<td>0.75</td>
<td>0.72</td>
<td>1.39</td>
</tr>
</tbody>
</table>

*Note. LR = likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

This p-value is derived from the likelihood ratio tests (other p-values derived from the Wald test).

---

**Peer background and other problem behaviours.** As can be seen in Table 59, no variables were significantly predictive of ethnicity at the $p < .05$ level of significance. The variable *gang involvement* approached significance, and was associated with increased likelihood of Māori ethnicity (decreased likelihood of Pākehā ethnicity). This was demonstrated by the odds ratio above one. The presence of gang involvement was associated with an increase in the odds of Māori ethnicity by a factor of 4.58.

Table 59

**Peer and other Problem Behaviours and Prediction of Ethnicity by Logistic Regression**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullied</td>
<td>0.05</td>
<td>-0.13</td>
<td>0.05</td>
<td>0.88</td>
<td>0.29–2.71</td>
<td>0.83</td>
<td>0.91</td>
<td>1.10</td>
</tr>
<tr>
<td>Bully</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td>0.33–2.99</td>
<td>0.99</td>
<td>0.94</td>
<td>1.07</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>4.28</td>
<td>1.52</td>
<td>3.38</td>
<td>4.58</td>
<td>0.90–23.21</td>
<td><strong>0.06</strong></td>
<td>0.84</td>
<td>1.19</td>
</tr>
<tr>
<td>Delinquent partner</td>
<td>0.23</td>
<td>0.25</td>
<td>0.23</td>
<td>1.28</td>
<td>0.47–3.52</td>
<td>0.63</td>
<td>0.93</td>
<td>1.08</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>2.75</td>
<td>1.55</td>
<td>1.99</td>
<td>4.73</td>
<td>0.55–40.84</td>
<td>0.16</td>
<td>0.91</td>
<td>1.09</td>
</tr>
<tr>
<td>Prostitution</td>
<td>0.27</td>
<td>0.46</td>
<td>0.26</td>
<td>1.58</td>
<td>0.26–9.32</td>
<td>0.61</td>
<td>0.96</td>
<td>1.05</td>
</tr>
<tr>
<td>Ran away</td>
<td>1.71</td>
<td>-0.68</td>
<td>1.65</td>
<td>0.51</td>
<td>0.18–1.43</td>
<td>0.20</td>
<td>0.95</td>
<td>1.05</td>
</tr>
</tbody>
</table>

*Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.*
Combined Model of Psychosocial Variables

In the previous analyses, analyses investigated the effects of predictor variables within domains; the current analysis provided a predictive model across all psychosocial domains to predict ethnicity. Predictor variables selected for this analysis were determined by the results of the Wald tests from the domain by domain analyses. Variables with a \( p \leq .10 \) were retained in the current initial analysis. This included the variables: ADHD, any substance use disorder, total types of substances, other drugs, witness violence, pregnancy stress, anger problems, poor social skills, hyperactivity/impulsivity/inattention, mother contact, sibling criminality and gang involvement. In order to provide more detail of these variables, the raw frequencies of these variables across the two ethnic groups are presented in Table 60. As the variable total substance use types was the only continuous variable, an independent t-test was conducted to examine how this variable differed between Māori and Pākehā youth. Māori youth (\( M = 1.66, \text{SD} = .91 \)) had significantly higher scores for total substance use types than their Pākehā counterparts (\( M =1.1, \text{SD} = 0.82 \)), \( t (94) = 2.43, \ p = .02 \).

Table 60

**Frequencies of the Predictor Variables Across Māori and Pākehā Youth, and Chi Square Results Testing for Significant Differences**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Māori (n, %)</th>
<th>Pākehā (n, %)</th>
<th>( \chi^2 )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD</td>
<td>6 (8.8)</td>
<td>8 (28.6)</td>
<td>–</td>
<td>0.02*</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>7 (10.3)</td>
<td>10 (35.7)</td>
<td>–</td>
<td>0.01*</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td>22 (32.4)</td>
<td>1 (3.6)</td>
<td>–</td>
<td>0.003*</td>
</tr>
<tr>
<td>Substance disorder</td>
<td>32 (47.1)</td>
<td>3 (10.7)</td>
<td>11.31</td>
<td>0.001</td>
</tr>
<tr>
<td>Other drug use</td>
<td>25 (36.8)</td>
<td>4 (14.3)</td>
<td>4.75</td>
<td>0.03</td>
</tr>
<tr>
<td>Witness violence</td>
<td>47 (69.1)</td>
<td>13 (46.4)</td>
<td>4.35</td>
<td>0.04</td>
</tr>
<tr>
<td>Pregnancy stress</td>
<td>22 (32.4)</td>
<td>6 (21.4)</td>
<td>1.15</td>
<td>0.28</td>
</tr>
<tr>
<td>Anger problems</td>
<td>42 (61.8)</td>
<td>22 (78.6)</td>
<td>2.52</td>
<td>0.11</td>
</tr>
<tr>
<td>Hyperactivity/impulsivity</td>
<td>18 (26.5)</td>
<td>15 (53.6)</td>
<td>6.45</td>
<td>0.01</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>19 (27.9)</td>
<td>2 (7.1)</td>
<td>5.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Mother contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal/none</td>
<td>4 (6.2)</td>
<td>5 (18.5)</td>
<td>3.21</td>
<td>0.07</td>
</tr>
<tr>
<td>Some or close</td>
<td>60 (93.8)</td>
<td>22 (81.5)</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*Note. *Fisher’s exact test used.

The selected variables were entered into one logistic regression analysis; this initial model is displayed in Table 61. As indicated by Table 61, the variables substance use disorder,
pregnancy stress, anger problems, poor social skills and sibling criminality were significantly predictive at the $p \leq .05$ level of significance.

Table 61

**Prediction of Ethnicity by Psychosocial Variables: Initial Logistic Regression Model**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$LR^2$</th>
<th>$\beta$</th>
<th>Wald</th>
<th>$OR$</th>
<th>95% CI</th>
<th>$p$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD</td>
<td>1.86</td>
<td>-1.69</td>
<td>1.73</td>
<td>0.18</td>
<td>0.01–2.29</td>
<td>0.19</td>
<td>.553</td>
<td>1.81</td>
</tr>
<tr>
<td>Substance disorder</td>
<td>5.93</td>
<td>2.00</td>
<td>5.15</td>
<td>7.36</td>
<td>1.31–41.28</td>
<td><strong>0.02</strong></td>
<td>.754</td>
<td>1.33</td>
</tr>
<tr>
<td>Total substance use types</td>
<td>0.07</td>
<td>-0.15</td>
<td>0.07</td>
<td>0.86</td>
<td>0.29–2.60</td>
<td>0.79</td>
<td>.406</td>
<td>2.46</td>
</tr>
<tr>
<td>Other drugs</td>
<td>1.51</td>
<td>1.44</td>
<td>1.45</td>
<td>4.22</td>
<td>0.41–43.68</td>
<td>0.23</td>
<td>.387</td>
<td>2.59</td>
</tr>
<tr>
<td>Witness violence</td>
<td>0.83</td>
<td>0.65</td>
<td>0.81</td>
<td>1.92</td>
<td>0.47–7.88</td>
<td>0.37</td>
<td>.824</td>
<td>1.21</td>
</tr>
<tr>
<td>Pregnancy stress</td>
<td>4.75</td>
<td>1.82</td>
<td>3.83</td>
<td>6.20</td>
<td>1.00–38.52</td>
<td><strong>0.05</strong></td>
<td>.951</td>
<td>1.05</td>
</tr>
<tr>
<td>Anger problems</td>
<td>4.68</td>
<td>-1.78</td>
<td>3.86</td>
<td>0.17</td>
<td>0.03–1.00</td>
<td><strong>0.05</strong></td>
<td>.868</td>
<td>1.15</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>9.25</td>
<td>-3.07</td>
<td>7.23</td>
<td>0.05</td>
<td>0.00–0.44</td>
<td><strong>0.01</strong></td>
<td>.775</td>
<td>1.29</td>
</tr>
<tr>
<td>Hyperactivity/impulsivity</td>
<td>0.00</td>
<td>-0.06</td>
<td>0.00</td>
<td>0.94</td>
<td>0.14–6.27</td>
<td>0.95</td>
<td>.527</td>
<td>1.90</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td>7.11</td>
<td>2.68</td>
<td>4.92</td>
<td>14.53</td>
<td>1.37–54.59</td>
<td><strong>0.03</strong></td>
<td>.870</td>
<td>1.15</td>
</tr>
<tr>
<td>Gang involvement</td>
<td>1.17</td>
<td>1.12</td>
<td>1.07</td>
<td>3.08</td>
<td>0.37–25.83</td>
<td>0.30</td>
<td>.838</td>
<td>1.19</td>
</tr>
<tr>
<td>Mother contact</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td>0.17–8.50</td>
<td>1.00</td>
<td>.765</td>
<td>1.31</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.

The next step involved removing the other variables from the model one by one, with the highest $p$-value first, to see if this impacted on the significance of other variables. Depending on each analysis, the next redundant variable was removed (highest $p$-value) one at a time until all variables had a $p$-value less than .10. The variables were removed in 8 steps, (1) mother contact, (2) total substance use types, (3) hyperactivity/impulsivity, (4) witness violence, (5) gang involvement, (6) other drug use, (7) pregnancy stress, (8) ADHD. For succinctness the results of each of these analyses are not presented. This left a final regression model with four significant variables. As can be seen in Table 62, the variables *substance use disorder* and *sibling criminality* were associated with increased likelihood of Māori ethnicity (decreased likelihood of Pākehā ethnicity), as indicated by the odds ratios above one. The presence of a substance use disorder was associated with an increase in the odds of Māori ethnicity by a factor of 8.30. The presence of sibling criminality was associated with an increase in the odds of Māori ethnicity by a factor of 16.03.

After taking into account *substance use disorder* and *sibling criminality*, the variables *anger problems* and *poor social skills* were associated with decreased likelihood of Māori
ethnicity (increased likelihood of Pākehā ethnicity), as indicated by the odds ratios below one. The presence of anger problems and poor social skills were associated with an increase in the odds of Pākehā ethnicity by factors of 4.35 (1/0.23) and 7.14 (1/0.14) respectively.

Table 62

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LRχ²</th>
<th>β</th>
<th>Wald</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance disorder</td>
<td>11.01</td>
<td>2.12</td>
<td>8.31</td>
<td>8.30</td>
<td>1.97–34.99</td>
<td>0.004</td>
<td>0.97</td>
<td>1.03</td>
</tr>
<tr>
<td>Anger problems</td>
<td>5.75</td>
<td>-1.47</td>
<td>4.97</td>
<td>0.23</td>
<td>0.06–.84</td>
<td>0.03</td>
<td>0.99</td>
<td>1.01</td>
</tr>
<tr>
<td>Poor social skills</td>
<td>8.30</td>
<td>-1.94</td>
<td>7.37</td>
<td>0.14</td>
<td>0.04–.58</td>
<td>0.01</td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>Sibling criminality</td>
<td>10.58</td>
<td>2.77</td>
<td>6.01</td>
<td>16.03</td>
<td>1.74–147.45</td>
<td>0.01</td>
<td>0.98</td>
<td>1.02</td>
</tr>
</tbody>
</table>

Note. LR = Likelihood ratio test; OR = Odds ratio; CI = Confidence interval.
Nagelkerke’s $R^2 = .44$. Classification accuracy = 78%.

Summary of Section Six: Can We Predict Ethnicity?

This section reported the demographic, psychosocial, offence related characteristics and trauma symptom correlates of Māori and Pākehā violent female youth.

The demographic variables (age at time of offence and socioeconomic deprivation scores) were not predictive of ethnicity.

Of the offence characteristic variables, intoxication at the time of the offence was associated with an increased likelihood of Māori ethnicity. In addition, having family victims was associated with increased likelihood of Pākehā ethnicity, whereas having community victims was associated with Māori ethnicity.

None of the TSCC scales were significantly able to predict ethnicity.

In the combined psychosocial logistic regression analysis (which combined the variables significant at the $p < .10$ level of significance in the domain by domain analyses), four variables were significantly predictive of ethnicity. The presence of a substance use disorder and sibling criminality was associated with Māori ethnicity, and the variables anger problems and poor social skills were associated with increased likelihood of Pākehā ethnicity.
CHAPTER FOUR: DISCUSSION

This study involved a retrospective file audit of a consecutive sample of 184 female youth who were referred to the Regional Youth Forensics Service between 2005 and 2011. The purpose of the study was to enhance understanding of the sample of violent female youth offenders by firstly describing their demographic and psychosocial backgrounds and comparing them to a group of youth with nonviolent offence charges. The characteristics of their index offences were also reviewed. The backgrounds and offence characteristics were compared and contrasted across three dichotomous variables: motivational subtype of violence (instrumental or reactive), victim subtype (family or community), and ethnicity (Māori or Pākehā). Overall, the findings of the current study suggest that violent female youth in this sample have complex needs and are similar to their nonviolent counterparts. Within the sample of female youth, the findings distinguished between group members in a number of ways indicating that violent female youth are a heterogeneous population. The findings will be discussed in five sections:

1. Who are violent female youth?
2. Can violent youth be distinguished from nonviolent youth?
3. Violence motivation: Correlates of instrumental and reactive aggression
4. Victim-offender relationship: Correlates of youth with community and family victims
5. Ethnicity: Correlates of Māori and Pākehā youth

Each of these sections will discuss the findings and how they fit with the current literature. A section on clinical implications will follow. The discussion section will conclude with considerations of the limitations of this study, and recommendations for future research.

Who are Violent Female Youth?

Consistent with international literature, female youth offenders in the present study have complex needs; 76% had a current or historical mental health diagnosis, and 62% had engaged in a form of deliberate self-harm. Of note, almost 40% meet the criteria for a substance use disorder. The vast majority of the sample had used cannabis (87%), and approximately 30% had engaged in stimulant use or used other drugs such as hallucinogens and inhalants.

In regards to victimisation, the vast majority (90%) had experienced at least one form of maltreatment and, on average, each had experienced more than two types (i.e., whether emotional abuse, physical abuse, sexual abuse, neglect, or witnessing violence). Of note, over
50% had an experience of sexual abuse. For the TSCC scales of Anxiety, Anger, Post-traumatic Stress, Dissociation and Sexual Concerns, around 20% of youth reached levels described as “clinically concerning”.

Almost 30% of the young women had evidence of stress in utero, which included drug or alcohol use by their mothers, or involvement in violence. Many youth were described as having anger problems (67%), hyperactivity/impulsivity problems (32%), and school learning problems (32%).

In regards to other contextual factors, the youth often had evidence of parent criminality, or parent drug and alcohol abuse (evidenced in approximately 40% to 50% of cases). Almost 60% had a history of being in CYF care at some point in their lives.

Growing up, the majority of these youth had behaviour problems at school (90%), truanted (75%) and around half had been excluded from school. A significant proportion (20%) evidenced involvement in a gang, and approximately 35% had been involved with an antisocial male romantic partner.

This study also identified that around 30% of the youth were intoxicated with drugs or alcohol at the time they committed their violent offence, and about half were with peers at the time of their offence.

It must be noted that the youth in this study may differ from the general population of youth offenders, given they were referred to RYFS for mental health concerns.

Can Violent Youth be Distinguished from Nonviolent Youth?

Overall, this research found very few demographic, socio-developmental and psychosocial factors distinguished the violent from the nonviolent youth. This finding is supported by previous research that has found violent and nonviolent youth to be indistinguishable on the basis of background family, social and developmental variables (Capaldi & Patterson, 1996; Farrington, 1991a; Piquero, 2000), and that violent and nonviolent offending behaviours are interrelated, as violent females are also likely to engage in nonviolent offences (Thornton et al., 2012). This was supported in this study as almost three quarters of the “violent youth” had evidence of engaging in nonviolent offending also, and only a quarter of youth had evidence of solely committing a violent offence.

The only significant differences between violent and nonviolent youth found in this study were that the nonviolent group were more likely to have a family member with a history of mental health problems, and to have experienced emotional abuse. It is difficult to hypothesise why these factors would be more associated with nonviolent offenders. However, it is possible
that having parents with mental health problems and being subjected to emotional abuse impacts negatively on both the home environment (e.g., poor supervision) and the parent-child relationship, which may predispose a youth to conduct problems, but without the additional modelling of physical aggression. These findings may be in line with a study by Allen Jr et al. (2003) who reported that nonviolent female youth appeared to have more disturbed home lives when compared with violent female youth.

Although this study did not find significant differences in the proportions of mental health diagnoses amongst violent and nonviolent youth, some disorders, such as ADHD and Substance Use Disorder, were more commonly found among the violent sample, and indicated a trend toward significance that would not be unexpected considering that such diagnoses have been associated with aggressive behaviour (Jensen, Martin, & Cantwell, 1997; Lennings et al., 2003).

Another variable that demonstrated a trend towards significance was parental incarceration, which was more likely for the violent group. Although caution must be taken when deriving conclusions from this finding as it was not significant, it might suggest that violent youth are exposed to more antisocial behaviour modelled by their family members.

Lastly, being a victim of bullying was more likely for the nonviolent group, with this difference indicating a trend towards significance. Although caution must be taken in deriving any conclusions from this finding as it was not significant, it might suggest different pathways to conduct problems, with nonviolent youth perhaps being impacted by factors such as bullying experiences.

**Violence Motivation: Correlates of Instrumental and Reactive Aggression**

It must be noted that the analyses used in this study sought to identify variables that were able to distinguish between the two groups (e.g., instrumental and reactive aggression). However, many of the variables were similarly prevalent for both groups and thus should be considered as risk factors for both of these types of aggression.

The present study revealed some variables that significantly distinguished between those youth that utilised instrumental and reactive aggression.

Ethnicity was found to be predictive of violence motivation, with Māori youth associated with increased likelihood of instrumental violence and Pākehā youth associated with increased likelihood of reactive violence. One explanation for this difference may be that the Māori youth had higher incidence of sibling criminality, and this factor was found to be associated with increased likelihood of instrumental offending. Peer involvement in the offence was also found to be associated with increased likelihood of instrumental offending. These findings are similar
to those of Fite et al. (2012) who found that peer delinquency is associated with instrumental, but not reactive, aggression. These findings fit with theories that propose that instrumental aggression develops from exposure to and endorsement of violent behaviour (Dodge, 1991; Vitaro et al., 2006). Having siblings and peers involved in crime undoubtedly would provide modelling and reinforcement of antisocial and aggressive behaviour.

A history of perpetrating bullying was also significantly associated with instrumental offending. This finding fits with the literature which identifies bullying as a strong risk factor for later offending (Ma, Stewin, & Mah, 2001; Ttofi et al., 2011) and posits bullying is a precursor to more serious aggressive behaviour (Ma et al., 2001).

This study also found that youth who were in the instrumental aggression group had significantly higher scores on the Anger scale of the TSCC, compared to the scores reached by the reactively aggressive group. Examples of items included in this scale are “wanting to yell and break things”, “getting mad and can’t calm down”, “wanting to hurt other people”, “getting into fights”, and “feeling like I hate people”. These items perhaps reflect antisocial attitudes, which may explain their stronger link with the youth who used instrumental violence.

Involvement with a delinquent romantic partner was found to be more likely for the instrumentally violent youth. Although this difference was not significant, it evidenced a trend in a direction that would not be unexpected, given previous literature. For example, research by Fite et al. (2012) found that peer delinquency is associated with instrumental but not reactive aggression.

Although not significant in the regression analysis, chi square testing indicated that a significantly higher proportion of youth in the instrumental group had parents who abused illicit drugs, a relationship that has been reported by others (Connor et al., 2004).

None of the variables in the present study were found to be associated with increased likelihood of reactive aggression. This is contrary to the findings from a meta-analysis which found reactive aggression to be more strongly correlated with various indices of psychosocial maladjustment and negative life events, such as internalising problems, emotional dysregulation, ADHD symptoms, peer rejection, peer victimisation, physical abuse and sexual abuse, when compared to instrumental aggression (Card & Little, 2006). However, this meta-analysis excluded samples of youth in criminal or psychiatric settings and was based on samples of both males and females.
Overall, a number of variables distinguished youth who offended against their family members from those who offended against community members.

Ethnicity was predictive of victim type, with Pākehā offenders more likely to victimise their family members, and Māori youth more likely to perpetrate violence in the community. This finding is similar to previous research that has found Caucasian youth (compared to other racial/ethnic groups) to be more prone to abusing their parents (Agnew & Huguley, 1989; Charles, 1986; Hartz, 1995; Nock & Kazdin, 2002). The explanation for the ethnic discrepancy in the present study remains unclear; however, in an attempt to explain the ethnic discrepancy in an American study, Nock (2002) suggested that a more permissive parenting style, which was more commonly found among European American families compared to African American families, might have played a role in the differences found.

The violence of youth with family victims was more likely to be reactive whereas the violence of youth who targeted community victims was more likely to be instrumental. This makes intuitive sense, as it would seem less common for youth to have an instrumental motive for violence against their family members. Victim age was also significantly predictive, with those with family victims more likely to target adult aged victims and those with community victims more likely to have youth/child aged victims. This finding may be due to the large number of youth that perpetrated violence against their mothers. The finding that mothers are the most common victim of parent abuse is consistent with the literature in this area (Gallagher, 2008; Ibabe & Jaureguizar, 2010; Walsh & Krienert, 2007).

The present study found that being victim to bullying was associated with increased likelihood of a youth having perpetrated violence against a family member. This association concurs with research by Cottrell and Monk (2004) who reported that youth who were bullied were at risk of victimising their parents. They added insight into this finding by explaining that youth would utilise abusive behaviour against their parents as a strategy to compensate for their feelings of powerlessness, and to express anger in a safe context. It is possible that bullying experiences for these youth may precipitate a loss of interest in learning and a subsequent drop in academic achievement and attendance rates (Ma et al., 2001), which may pave their pathway to involvement in antisocial behaviour.

This study found higher TSCC Dissociation scale scores were linked to an increased likelihood of having family victims. This finding may be explained in relation to the more prevalent backgrounds of sexual abuse found in this group, as dissociation has been proposed to
be a coping mechanism employed or an adaptive response to childhood abuse (Perry, Pollard, Blakley, Baker, & Vigilante, 1995).

Although not statistically significant, experiences of sexual abuse were more strongly associated with the family victim group, and demonstrated a trend towards significance. The association between sexual abuse and violence against family members has been found by others (Cottrell & Monk, 2004; Herrera & McCloskey, 2003). Although this variable did not significantly distinguish the family-violent group from their community-violent counterparts, the high rate (68%) observed in the family-violent group indicates it may be an important risk factor. Other researchers (e.g., Connor et al., 2004) have reported an association between sexual abuse and the use of reactive aggression, the type of aggression which was employed by the vast majority of youth who perpetrated violence against their families in this study. Experiencing sexual abuse from within the family, and consequently using reactive aggression, would fit with the idea that reactive aggression develops from experiences of poor attachment relationships and environments characterised by inconsistency and punishment, which lead to a deficit in behavioural regulation skills and leave the child hypervigilant to threat cues (Dodge, 1991; Vitaro et al., 2006).

Although not significantly predictive in the regression analysis, the chi square analysis did indicate that youth in the family members group were more likely to have a diagnosis of ADHD than youth in the community-violent group. Given that the vast majority of youth in the family-violent group used reactive violence, ADHD characteristics such as impulsivity may explain this finding. Problems with impulse control in family-abusive youth has been found by others (Cottrell & Monk, 2004).

The presence of cognitive impairments did not significantly distinguish between the two groups but did demonstrate a trend towards significance, with cognitive impairments associated with an increased likelihood of having family victims.

Overall, it appears that youth who are violent towards family members have high levels of school stressors, resulting from victimisation (bullying), and their high likelihood of having cognitive impairments (32%) or school learning problems (44%). It is possible that this may lower their frustration tolerance or they may bring home their frustrations and lash out in a reactively violent manner towards their parents. Difficulties with ADHD may exacerbate this risk.

On the other hand, logistic regression indicated that a history of school exclusions, gang involvement and having peer involvement in the offence were associated with increased likelihood of having community victims. Chi square testing revealed that community-violent
youth had significantly higher proportions of sibling criminality, parental incarceration, school exclusions, gang involvement, perpetrating bullying, and involvement with delinquent male romantic partners, when compared to the family-violent youth. They more often used violence for instrumental gain. These findings suggest that the violence of these youth appears to be embedded in a contextual background of antisocial behaviour that is endorsed and reinforced by family and peers, which fits with the Social Learning Theory of antisocial behaviour.

**Ethnicity: Correlates of Māori and Pākehā Youth**

Māori youth were disproportionately represented in this sample (60%). This is consistent with national offending statistics, where Māori are highly over-represented (Department of Corrections, 2007). In the present study, a number of variables distinguished Māori from Pākehā youth. The logistic regression analyses indicated that the presence of a substance use disorder, sibling criminality, being intoxicated at the time of the offence, and having community victims were associated with Māori ethnicity. Chi square testing revealed that significantly higher proportions of Māori youth, when compared to Pākehā youth, were involved in gangs, had witnessed violence, had siblings involved in crime, had used drugs falling in the “other drugs” category (e.g., inhalants, hallucinogens) and had diagnoses of substance use disorders. Of importance, the findings suggest that substance use was a significant problem for young Māori females in this sample. They were more likely to have been diagnosed with a substance use disorder, more likely to have experimented with a higher number and wider variety of illicit drugs, and were more likely to have been intoxicated at the time they committed their violent offence. This may pose a challenge for services engaging with these youth as research has indicated that those with multiple substance use disorders are more recalcitrant to treatment, and have higher treatment dropout and relapse rates (Almog et al., 1993; Cohen, 1981; Rounsaville et al., 1987; Rowan-Szal et al., 2000).

Although not found in this study, Connor et al. (2004) reported an association between instrumental aggression and substance use disorders (and found substance use disorders had no relationship to reactive aggression). Māori youth in this study displayed both high rates of instrumental aggression and substance use disorders. The higher rates of substance use disorder amongst Māori youth in this study may be linked to higher use of instrumental aggression, as instrumental aggression has been found to be predictive of delinquency (such as substance abuse) and disruptive behaviours (Vitaro, Gendreau, Tremblay, & Olligny, 1998).
Other researchers (McClelland et al., 2004; Teplin et al., 2002) have found ethnic differences in the prevalence of substance use disorders amongst youth offenders; however, in these studies, Caucasians had higher rates than the minority groups (Hispanics, African Americans). However, the vast differences between these populations and the NZ population mean that comparing the findings may not be that useful. Few studies have compared the treatment needs of Māori and Pākehā youth, one study (Lim, Lambie, & Cooper, 2012) that investigated this in a sample of adolescent male sexual offenders found Māori youth exhibited more delinquent behaviours compared to their Pākehā counterparts, and suggested the findings supported the need for more extensive multisystem interventions and approaches that involved the whole whānau.

The finding that Māori youth were more likely to have siblings involved in crime and to have witnessed domestic violence indicates that aggressive behaviour may be set against a home environment where antisocial behaviour is modelled, endorsed and reinforced.

The finding that Māori youth were more likely to witness violence in the home may partially explain the higher rates of instrumental violence in this group, as researchers have found family violence to be correlated with instrumental aggression (Connor et al., 2004), which supports research that identifies learned behaviour as a significant factor in the development of early aggressive behaviour (Moffitt, 1993). Dennehy (2005) discussed that childhood experiences of violence foster the development of cultural norms and sets of beliefs that support violence in later life.

On the other hand, the logistic regression analyses indicated that the presence of anger problems, poor social skills and having family victims were associated with Pākehā ethnicity. Chi square testing revealed that the Pākehā sample had significantly higher proportions of youth presenting with ADHD diagnoses/ADHD type symptoms and poor social skills, when compared to the Māori youth. For these youth, ADHD symptoms, poor social skills, and anger problems may point to difficulties in emotion regulation and poor frustration tolerance.

**Clinical Implications**

Overall, these findings suggest that violent female youth offenders have complex needs. They often come from chaotic backgrounds, where antisocial behaviour is embedded in their social landscapes and often modelled to them by close others. The importance of the finding of high rates of substance use is highlighted in relation to research that indicates substance use can impact on treatment responsivity and has been correlated with treatment dropout (Almog et al., 1993; Cohen, 1981; Rounsaville et al., 1987; Rowan-Szal et al., 2000). Importantly, this study
found key differences between female youth when grouped according to violence motivation, victim subtype and ethnicity. The clinical implications of these findings are discussed below.

From an intervention perspective, the instrumental aggression used by female youth in this sample appears to be embedded in a contextual background of antisocial behaviour that is endorsed and reinforced by both family and peer groups. This may point to a higher need for multisystem interventions and wraparound services for these youth such as MST. MST is an empirically supported treatment for conduct disordered youth which targets individual, family, and social-contextual risk factors associated with the antisocial behaviour of the adolescent (Seto & Lalumiere, 2010), and seems fitting considering the correlates of instrumentally violent youth.

As has been recommended by previous researchers (Fite, Wimsatt, et al., 2012), targeting antisocial peer affiliations is important for the prevention and exacerbation of instrumental aggression. This may involve teaching and enhancing parenting skills such as monitoring, to prevent the youth engaging with antisocial peers. The importance of this is emphasised for female youth, considering research showing the peer effect, particularly the influence of opposite sex peers and partners, may be more pronounced for females (Haynie et al., 2007). It may also be important for these youth to foster friendships and relationships with prosocial peer groups, and have involvement in positive recreational activities. This may be achieved through mentoring by same-aged prosocial peers. The Nga Tai Tamahine o Kirikiriroa (NTTK) programme set up by the NZ police in Waikato is an example of a programme developed for female youth offenders which has a focus on the youth establishing relationships with prosocial peers, with some female youth reporting positive effects (Brennan-Tupara, 2011).

Considering that scores on the Anger scale of the TSCC may be higher for instrumentally than reactively aggressive youth, investigating where this underlying anger came from may be important (i.e., did it emerge as a response to a traumatic event, and what may be the core issues that need to be addressed?).

Moreover, considering these youth are likely to have a history of bullying others, building on the development of empathy and understanding the impact their behaviour might have on others is important. As bullying has been identified as a risk factor for aggressive behaviour (Ma et al., 2001; Ttofi et al., 2011), utilising effective interventions that target school bullying and promoting safer school communities may be an important preventative action (Ttofi et al., 2011)

In regards to victim subtype, the community-violent youth appear to have overlaps with the instrumentally violent group, and thus similar treatment considerations apply to this group. Their violence appears to be embedded in a culture of antisocial behaviour, where these behaviours are modelled, endorsed and reinforced by those around them, which may include peers, siblings and
romantic partners, in the context of gang involvement and exclusion from school. This highlights that these youth may also need more intensive wraparound services and multisystem interventions that will address their offending across home, school and community environments.

The literature indicates that school exclusion may lead a young person to gravitate towards antisocial peers, and the duration of unemployment following school leaving is implicated in the risk for offending (Fergusson et al., 1997). Therefore, assisting these youth to stay in school or seek an appropriate alternative education or employment option may be crucial. However, as these alternative education options may sometimes foster an environment where youth may stimulate connections with other antisocial youth, this may be done alongside mentoring, and establishing supportive relationships with prosocial peers. In her NZ study of antisocial female youth, Swift (2011) also emphasised strengthening connections to education as an important intervention point for these girls. Swift concluded that “removing a girl from a classroom is a way to shut down her bad behaviour, removing a girl from a school is a way to shut down her life” (p. 95).

Youth who offend violently in the home may have different needs; this study indicates that difficulties from experiences of victimisation (e.g., bullying, sexual abuse) may have impacted on their ability to regulate their emotions and subsequently predisposed them to difficulties with reactive aggression. Given their difficulty with regulating emotions, and their abusive histories, adapting Dialectical Behaviour Therapy (DBT) or aspects of DBT may benefit this group. DBT integrates skills training, problem solving, and validation to support participants to decrease their impulsive, aggressive and self-destructive behaviours (Trupin, Stewart, Beach, & Boesky, 2002). Internationally, DBT has shown some promising results in group work with adolescents in residential facilities (Quinn & Shera, 2009).

The high rates of sexual abuse and higher scores on the Dissociation scale of the TSCC found amongst the family violent youth highlight the importance of routine screening for abuse and addressing victimisation experiences. Moreover, as dissociation may be a risk factor for violence (Moskowitz, 2004), female youth should be routinely screened for dissociative symptoms upon assessment, and the relationship to their offending should be explored. As discussed by Moskowitz (2004), treatment programmes designed for highly dissociative violent offenders may assist them to identify and address their dissociative symptoms, and the triggers that precede dissociative experiences. Importantly, family therapy, such as Functional Family Therapy (Alexander & Robbins, 2011) (or other therapies designed to improve family interactions, so that disruptive behaviour is no longer functional for the youth) may be effective.
Other interventions, that emphasise the parent-teenager relationship, such as the Connect Parent Group (Moretti et al., 2009) may also be valuable for this group of youth. Interventions may also involve fostering a safe environment to repair and strengthen family relationships.

Key differences were also found between Māori and Pākehā youth. These differences highlight the need to develop targeted interventions that address unique treatment needs. The need for this is emphasised further given the over-representation of Māori youth in this sample.

Considering the salience of drug and alcohol problems for Māori youth in this sample, interventions and programmes developed for Māori youth may need a focus on substance use. This may include: (1) psychoeducation around the effects of alcohol and drugs and what constitutes safe use, (2) assessing and addressing attitudes towards the use of alcohol and drugs, and (3) exploring how this may affect their use of aggression. Importantly, given that substance problems may impact on a young person’s engagement in treatment, integrating these considerations into programmes based specifically on Māori cultural values and principles may be most effective, as research has demonstrated culturally centred programmes have led to improved outcomes for Māori youth (Doone, 2000).

The importance of whānau ora approaches is emphasised by the high rates of sibling criminality and family violence in this study. Whānau ora approaches support Māori families to strive for optimal health and well-being and empower whānau as a whole instead of focusing on individual family members and their difficulties (Kidd, Gibbons, Lawrenson, & Johnstone, 2010). Some whānau may want to direct their progress, and work with a hapū, iwi or a non-government organisation, while other whānau may want to seek assistance from specialist Whānau Ora providers who will offer wraparound services and tailor these to their unique needs (Te Puni Kōkiri, 2013). Whānau interventions may target attitudes towards domestic violence, identifying triggers and understanding why they may respond in the way they do, and how this may make sense considering what they have learnt in the past, including in terms of the profound effects of colonisation and racism intergenerationally (White et al., 2008), in conjunction with teaching more adaptive responses. As others have discussed (Dennehy, 2005), it is important to seek understanding of the effects of domestic violence in family backgrounds and negative social conditions. Interventions may also involve fostering a safe environment to strengthen family relationships.

Considering the increased likelihood of sibling criminality and gang involvement for these young people, introducing positive role models may be an important step and, where possible, role models within the adolescent’s own community should be identified.
Māori female youth have complex needs, treatment programmes may benefit from smaller caseloads and higher resourcing, as well as enhanced training and professional development for clinicians working with Māori youth. Moreover, early intervention strategies targeting high risk families may serve to prevent the development and escalation of whānau difficulties. Overall, these findings suggest that Māori youth may have unique treatment needs, and a closer examination of “what works” for Māori youth is critical if we are to improve outcomes for Māori youth.

For Pākehā youth, this study indicates that aggression may be related to ADHD type symptoms, anger problems and poor social skills, which may point to emotion regulation difficulties and family issues. Programmes that focus on enhancing emotion regulation skills, such as anger management may be effective. Interpersonal skills training may also be incorporated into treatment. As these youth often perpetrate violence against their parents, family therapy, such as Functional Family Therapy (Alexander & Robbins, 2011) may be effective.

Limitations

This study was the first of its kind to examine the differences between subgroups of violent female youth offenders in NZ. It has identified some important considerations for understanding and addressing the needs of violent female youth across the domains of violence motivation, victim-offender relationship and ethnicity. However, a number of limitations must be considered.

The cross-sectional design of this study was useful for identifying correlates and associated features of the various groups of female youth, however because the measures used were collected at the same point in time, the results cannot indicate anything about the developmental course of the variables and causation cannot be assumed.

As offending youth were referred to this service for mental health concerns, they may not be representative of the wider population of violent female youth offenders. Thus, these findings may not be generalisable to the wider population of violent female youth. The limited information available in the files meant that important variables were coded dichotomously, and this may have limited the potential of this study to identify significant differences between the groups. For example, a dichotomous categorical coding system for abuse histories, although clinically useful, does not permit an assessment of the effects of trauma severity and potentially hides group differences. Limited file information also meant that many variables were coded as “evidence in file” versus “no evidence in the file”; what information was available depended on each individual assessment and the information gathered or not gathered in each case.
Not all clients had the TSCC administered, and therefore the results of this may not be generalisable to the whole population as this measure may have been administered in cases where the clinician had suspicions of trauma.

Limited information on the adolescent’s previous offences meant that the dependent variables (motivational subtype of violence and victim type) were only coded for the index offence. This eliminated information about youth who may have had histories of offending both instrumentally and reactively, and those who victimise both family and community members, and hence the groups may have had more overlap than anticipated.

As this study classed each offender into violence motivation group based on their index offence, it was unable to measure the intercorrelation between instrumental and reactive aggression and control for the influence of the other aggression subtype (as previous studies that used psychometric measures of instrumental and reactive aggression have done). Moreover, the broad age range of this sample may have concealed potential age-specific developmental correlates of the two violence motivation types.

**Directions for Future Research**

Future research may use validated measures that gain comprehensive details of the adolescents’ background experiences and use of aggression to facilitate profile comparison and detect differences between the groups. Longitudinal studies may also shed further light on the development and progression of female aggression. Qualitative studies with female youth offenders may provide further information around their use of violence. Given female youth offenders’ high rates of experience of maltreatment, future studies focusing on gaining a deeper understanding of how victimisation may lead a young woman to become a victimiser herself may be important to inform both prevention and intervention strategies. In NZ, further development and evaluation of treatment programmes for female youth who behave violently is needed.

In order to support further research into this population, recommendations are offered to the Regional Youth Forensics Service in Appendix G. These recommendations may also be relevant to other youth forensic services.

**Conclusions**

The findings of this comparative and descriptive work indicate that violent female youth are a heterogeneous population, with different factors influencing the development and manifestation of their aggressive behaviour. The present study provides important context and understanding
into the violence perpetrated by female youth. The study revealed significant differences within the three outcome variables across demographic, psychosocial and offence characteristic domains. It provides information on the demographic, psychosocial, and incident/offence based correlates of the motivational subtype of violence, victim subtype and ethnicity. This research provides support for an individualised approach for each young woman, and disputes a “one size fits all” approach to treating the complex phenomenon of female youth violence.
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Appendix A: The Client Information Sheet

**DEMOGRAPHIC VARIABLES**

Age at referral_________                Ethnicity_________________________________
Address/street name______________________________________________________
Socioeconomic deprivation index score________________________________________

**PSYCHOSOCIAL VARIABLES**

**Mental health variables**

Current diagnoses__________________________________________________________
Historical diagnoses________________________________________________________
Total number of mental health diagnoses________________________________________
History of engagement in deliberate self-harm                Evidence / No evidence

**Substance use variables** (Tick if evidence)

☐ Cannabis
☐ Opiates
☐ Stimulants
☐ Other drugs

Total number of drug type used_______________________________________________

**Family background variables**

Parent marital status:

☐ Parents together
☐ Parents separated or one or more parent deceased

Contact with mother:

☐ Some or close
☐ Little or none

Contact with father:

☐ Some or close
☐ Minimal or none
Number of changes in caregivers:

- No evidence of changes
- Evidence of 1 change
- Evidence of 2-4 changes
- Evidence of 5 or more changes

Has the youth ever been in the care of Child Youth and Family Services?

- Evidence
- No evidence

Is there evidence of mental health problems in the family?

- Evidence
- No evidence

Is there evidence of parental illicit drug use?

- Evidence
- No evidence

Is there evidence of parental alcohol abuse?

- Evidence
- No evidence

Is there evidence of parental criminality?

- Evidence
- No evidence

Is there evidence of parental incarceration?

- Evidence
- No evidence

Is there evidence of sibling criminality?

- Evidence
- No evidence
**School variables**

Number of schools attended:

- Unknown
- 3 or less
- 3-5 schools
- 6 or more schools

Is there evidence of school behavioural problems?

- Evidence
- No evidence

Is there evidence of frequent truancy?

- Evidence
- No evidence

Is there evidence of school learning difficulties?

- Evidence
- No evidence

Is there evidence of school exclusions (expulsions or suspensions)?

- Evidence
- No evidence

**Peer and other problem behaviour variables**

Is there evidence the youth was victim to bullying?

- Evidence
- No evidence

Is there evidence the youth was ever a perpetrator of bullying?

- Evidence
- No evidence

Is there evidence the youth is involved in a gang?

- Evidence
- No evidence
Is there evidence the youth has been involved with a delinquent romantic partner?

☐ Evidence
☐ No evidence

Has the youth ever been pregnant?

☐ Evidence
☐ No evidence

Has the youth ever engaged in prostitution?

☐ Evidence
☐ No evidence

Has the youth ever absconded from a placement or run away from home?

☐ Evidence
☐ No evidence

**Developmental variables**

Approximate age when problem/conduct disordered behaviours began___________

Evidence of stress during pregnancy (in utero)

☐ Evidence
☐ No evidence

Evidence of a cognitive impairment?

☐ Evidence
☐ No evidence

Evidence of anger problems?

☐ Evidence
☐ No evidence

Evidence of grief/bereavement issues?

☐ Evidence
☐ No evidence
Evidence of poor social skills?

☐ Evidence
☐ No evidence

Evidence of ADHD-type symptoms?

☐ Evidence
☐ No evidence

**Maltreatment Variables**
Types of maltreatment experienced (tick if evidence)

☐ Sexual abuse
☐ Emotional abuse
☐ Physical abuse
☐ Neglect
☐ Witnessed domestic violence

Total number of maltreatment types __________________________

**Offending Variables**
The Australian and New Zealand Standard Offence Classification (tick if evidence)

☐ Violent offence
☐ Other offences against the person
☐ Property offences
☐ Drug offences
☐ Offences against the administration of justice
☐ Offences against good order
☐ Traffic offences
☐ Miscellaneous offences

Offender type

☐ Violent
☐ Nonviolent

*Complete the following questions only for those youth identified in the above question as **violent offenders**
Offence code according to the NZ police codes (tick only one box and code only the most violent offence)

- Homicide
- Kidnapping and abduction
- Robbery
- Grievous assault
- Serious assault
- Minor assault
- Intimidation/threats
- Group assemblies

Code the following questions for only the adolescent’s most serious violent offence

Motivational subtype of violence

- Primarily instrumental
- Primarily reactive
- Reactive–instrumental
- Instrumental-reactive
- Inadequate information to code

Victim characteristics

Victim age

- Child/peer aged
- Adult/elderly
- Unknown

Victim sex

- Male
- Female
- Unknown

Victim-offender relationship

- Family member
- Community member
- Severity of Violence

Severity of violence according to the Violence Assessment Scale:
Rating______________________
Appendix B: The Coding Manual

Demographic Variables

*Age at referral*
Defined as client’s age at the time of referral as stated in the file information

*Ethnicity*
Ethnic identity as stated in the clinical file. Due to the large number of combinations recorded, clients were recoded into groups with the following hierarchy: Māori, Pacific Island, Pākehā, Asian or other. For example a youth who was identified as “Māori and Pākehā” was coded as Māori.

*Parent marital status*
Code using two categories, either; parents together, or parents separated/one or more parent deceased.

*Socioeconomic deprivation index*
A socioeconomic deprivation score (SED) was ascertained for each client by matching the adolescents’ home address (parental address or mother’s address if parents were separated) to the corresponding meshblock score of the 2006 NZ Index of Deprivation (Salmond, Crampton, & Atkinson, 2007). This index has an ordinal scale which ranges from 1 to 10, where a score of 10 indicates that the area is situated in the most deprived 10 percent of areas in NZ. It must be cautioned that these scores describe the general socioeconomic deprivation in an area, and may not accurately describe the deprivation of an individual.

Mental Health Variables

*Mental health diagnoses*
Any previous or current mental health diagnoses that appeared in the clinical file information were recorded. Substance use disorders were recorded if there was evidence in the file information of any previous or current diagnosis of a substance abuse or substance dependence disorder. Substance abuse and substance dependence were not considered separately due to the potential of low individual cell counts.

*Deliberate self-harm (DSH)*
This variable is to be coded as present or absent. The presence of DSH is coded when there is evidence in file information of any form of self-injurious behaviour, including cutting, overdosing, hanging, self-strangulation, or running into traffic, regardless of intention to die or not.
**Types of substances and drug classes**

For each of the following four categories of substances; cannabis, stimulants, opiates, other drugs, the youth is coded positively if there is evidence in the file of any previous or current use. 

**Stimulants:** Includes cocaine, amphetamine, dextroamphetamine/dexedrine, methylphenidate, and MDMA/Ecstacy.  

**Cannabis:** Includes marijuana, hash, hash oil  

**Opiates:** Includes heroin, morphine, codeine, hydromorphone, methadone, oxycodone, fentanyl  

**Other drugs:** Includes other types of drugs such as hallucinogens, peyote, PCP, ketamine, inhalants, anxiolytics, sedatives (e.g. prescription sleeping medication). This category excludes nicotine and caffeine.

---

**Family Variables**

**Contact with mother**

Code dichotomously, as either: “minimal or none” or “some or close”

**Contact with father**

Code dichotomously, as either: “minimal or none” or “some or close”

**Number of changes in caregivers**

A change in caregiver included transitions from one caregiver to another (e.g. foster care), a parent leaving (e.g., parental divorce), or a new caregiver joining the family (e.g. a stepfather). This is to be coded as: no changes, evidence of 1 change, evidence of 2-4 changes, or evidence of 5 or more changes.

**Child, Youth and Family Services (CYFS) care history**

Code positively if there is evidence in the file information of the client, at some point in their life, being in the care of CYFS.

**Family history of mental health disorder**

Code positively if there is evidence in the file information of mental health difficulties (excluding substance abuse, as this was coded separately) amongst the clients family members.

**Maternal/Paternal alcohol abuse**

Code positively if there is evidence in the file information of a parental alcohol problem.

**Maternal/Paternal illicit drug abuse**

Code positively if there is evidence in the file information of a parental illicit drug problem.

**Parental Criminality**

Code positively if there is evidence in the file information of parental involvement in criminal activity, either prosecuted or not.
Sibling Criminality
Code positively if there is evidence in the file information of sibling/s involvement in criminal activity, either prosecuted or not

Parental history of incarceration
Code positively if there is evidence in the file information of parental incarceration

School Variables

Number of schools attended
The number of schools the youth attended was coded into the following; 3 or fewer schools, 3-5 schools, 6 or more schools; or unknown. Note that 3 or fewer schools would indicate the client attended one primary school, one intermediate school and one high school.

School learning difficulties
Code positively if there is evidence in the file information of the youth having had difficulties with learning. Note: evidence of poor academic performance was not classed as evidence for learning difficulties as this could be attributed to other factors (e.g., poor motivation or poor attendance).

School behavioural problems
Code positively if there is evidence of the youth having exhibited problematic behaviours at school (e.g., non-compliance with teacher requests, disruptive behaviour, swearing, fighting)

School exclusions
Code positively if there is evidence in the file information of the youth having ever been suspended or expelled from school

Truancy
Code positively if there is evidence in the file information of the youth having truanted from school frequently

Peer and Other Problem Behaviour Variables

Perpetrator of bullying
Code positively if there is evidence in the file information that indicates the youth had bullied other children/youth

Victim of bullying
Code positively if there is evidence in the file information of the youth having been a victim of bullying (including both emotional and physical bullying)
**History of involvement with a delinquent romantic partner**
Code positively if there is evidence in the file information of the youth ever being involved with a romantic partner who was involved in any type of criminal activity

**Gang involvement**
Code positively if there is evidence in the file information that the youth belonged to a gang or was closely involved with gang members

**Run away from home/absconding**
Code positively if there is any evidence of the youth having run away from home, absconded from placements or having been reported as a missing person to the police.

**Pregnancy**
Code positively if there is any evidence in the file information of the youth having ever been pregnant

**Prostitution**
Code positively if there is any evidence in the file information of the youth having engaged in sexual behaviours for the purpose of monetary gain or for the purposes of gaining drugs or alcohol

**Developmental Variables**

**Pregnancy stress**
Code positively if there is any evidence of the mother’s use of alcohol, tobacco or drugs during pregnancy, or exposure to violence

**ADHD type symptoms**
Code positively if there is evidence in the file information of the youth having had difficulties with hyperactivity, impulsivity or attention problems

**Poor social skills**
Code positively if there is any evidence in the file information of the youth having had poor social skills, problems maintaining peer relationships or social isolation

**Anger problems**
Code positively if there is any evidence in the file information of the youth having had difficulties with anger

**Grief/bereavement issues**
Code positively if there is any evidence in the file that the youth had difficulties with grief or bereavement (e.g., difficulty adjusting after the loss of a parent).
**Cognitive impairment**
Code positively if there is evidence in the file of any type of cognitive impairment (e.g. specific learning disorders, intellectual disabilities or low intellectual functioning).

**Age when problem behaviours began**
Record the approximate age when problematic/conduct disordered behaviours became apparent

**Maltreatment Variables**
The definitions for physical abuse, sexual abuse, emotional abuse and neglect were taken from the guidelines of Child, Youth and Family (Child, Youth and Family, 2011).

**Physical abuse**
Code positively if there is any evidence in the file information that the youth had been physically abused. Physical abuse was defined as: any behaviour which results in physical harm to a child.

**Sexual abuse**
Code positively if there is any evidence in the file information that the client had been sexually abused. Sexual abuse was defined as any act where an adult or a more powerful person uses a child or young person for a sexual purpose.

**Emotional abuse**
Code positively if there is any evidence in the file information that the client had been emotionally abused. Emotional abuse is defined as: a pattern of behaviour where the child is rejected and put down. They may be isolated, constantly degraded and criticised, or negatively compared to others.

**Neglect**
Code positively if there is any evidence in the file information that the client had been neglected. The definition of neglect covered the following:

- **Physical neglect** – not providing the necessities of life like a warm place, enough food and clothing.
- **Neglectful supervision** – leaving children home alone, or without someone safe looking after them during the day or night.
- **Emotional neglect** – not giving children the comfort, attention and love they need through play, talk, and everyday affection.
- **Medical neglect** – the failure to take care of their health needs.
- **Educational neglect** – allowing chronic truancy, failure to enrol children in school, or inattention to special education needs.

**Witnessing Violence**
Code positively if there is any evidence in the file information that the client had witnessed violence, in the community or in the home

**Offending Variables**

_**Types of offences**_

The Australian and New Zealand Standard Offence Classification (Australian Bureau of Statistics, 2011) was used to code the types of offences/charges carried out by each youth. This classification system has 8 categories of offences (violent offences, other offences against the person, property offences, drug offences, offences against the administration of justice, offences against good order, traffic offences and miscellaneous offences). Each youth is to be coded positively or negatively for each offence category, depending on if they have evidence in their file information of ever committing a crime or having a charge of that description.

_**Index offence**_

For the youth who committed a violent offence, further details are to be collected. These include the motivational subtype of violence, severity of violence used, and details on the victim (as outlined below). If the youth has more than one violent charge/offence, the most serious offence is to be used. This can be ascertained according to the Violence Assessment Scale (Alia-Klein et al., 2007).

_**Motivational subtype of violence**_

The violence utilised in each offence is to be categorised using a likert-type scale developed by Woodworth and Porter (2002). As per this scale the offences are to be coded into the following categories; primarily reactive violence, primarily instrumental violence, reactive/instrumental or instrumental/reactive. In addition, for offences classified as primarily instrumental violence or instrumental/reactive, the specific goal of the offence is to be coded as; primary instrumental, secondary instrumental or combination instrumental. These categories have been described in the methods section.

_**Severity of violence used in index offence**_

Severity of violence is to be coded according to the Violence Assessment Scale (VAS; Alia-Klien et al., 2007). This has been described in the methods section. See Appendix D for a copy of the VAS.

_**Intoxication at the time of the index offence**_

This is to be coded positively if there is evidence in the file information that the youth was intoxicated with alcohol or drugs at the time they carried out the index offence.
**Accomplices**

Code positively if there is evidence in file information that the youth committed the offence with accomplices or was with peers at the time the offence occurred

**Victim type**

Code into family, community (e.g., stranger, peer, police), or unknown

**Victim age**

Code dichotomously into child/youth, adult/elderly or unknown

**Victim sex**

Code into male, female or unknown
Appendix C: The NZ Police Codes for Violent Offences

Robbery:

- Aggravated Robbery
- Non-Aggravated Robbery
- Assaults with Intent to Rob
- Compelling Execution of Documents
- Aggravated Robbery

Grievous Assault:

- Wounding with Intent
- Injuring with Intent
- Aggravated Wounding/Injury
- Disabling/Stupefying
- Dangerous Acts with Intent
- Injure – If Death Ensued
- Manslaughter
- Miscellaneous Grievous Assaults
- Use Firearm against Law Enforcement Officer
- Assault with Weapon

Serious Assault:

- Aggravated Assaults
- Assault with Intent to Injure
- Assault on Child (Under 14 years)
- Assault by Male on Female
- Assaults Police
- Assaults Person Assisting Police
- Assaults Person Lawful Execution Process
- Common Assault
- Miscellaneous Common Assault

Minor Assault:

- Assault on Law Enforcement Officers
- Assaults Person Assisting Police
- Assaults Official (Other Statutes)
- Common Assault
- Miscellaneous Common Assault
Appendix D: The Violence Assessment Scale (VAS)

The Violence Assessment Scale (VAS; Alia-Klein et al., 2007)

100 Murder or disabling injuries that involved repeated clubbing, stabbing, shooting, or mutilating over an extended period of time to one or more victims as in mass murders and elaborated torture and/or disfigurement. Setting up of explosives where people reside and/or work. Kidnapping a group of people as in hijacking an aircraft.

90 Murder or severe injury that involved stabbing, shooting, running over, or strangling. Disabling injuries that require extensive, long-term medical treatment and hospitalization such as multiple broken bones, internal injuries, head injury with loss of consciousness. Causing permanent damage to victim.

80 Violent behaviour toward others that likely requires a short hospital stay. Causing first or second degree burns, deep cuts, broken bones, concussion, or other head injury. Slamming against the wall or shaking hard (when victim is young). Threat with a loaded firearm in hand as in armed robbery. Rape and/or extensive, physically injurious sexual assault.

70 Violent behaviour toward others that likely requires emergency medical attention. Causing broken jaw, teeth, wounds requiring stitches. Sexual assault (no penetration), molestation, endangering, and/or harming vulnerable persons (children, elderly, disabled, etc.). Setting a fire where and when people are presumed to be present.

60 Threatening with a knife or other sharp or hard instrument. Throwing things at victim and causing harm. Punching, kicking, and leaving bruises, bites, minor cuts, and scratches. Assault resulting in medical attention. Killing and/or torture of animals. Breaking and entering where persons are presumed to be present.

50 Physical assault without use of weapon of any kind. Hitting, slapping, and pushing around. Verbal threats of murder or severe injury within a threatening context. Setting of fire or breaking and entering at inhabited locations but not when anyone is presumed to be present. Unwanted sexual contact such as brushing against or grabbing sexually.

40 Clear potential for physical harm. Physical threat including raising a fist, or making assault contact a near miss. Purposefully driving into things, throwing things without aiming at persons. Invading personal space and grabbing of arm or hair. Lewd gestures. Ignoring a restraining order. Stalking with a progressively threatening pursuit.

30 No physical harm. Damage to property, bullying by using extremely loud voice and/or sudden outward gestures. Following with unwanted indirect contact (by third party, phone, or mail), trespassing, and invading privacy (consider repetition of stalking and/or harassing—more intense than below).

20 Clear aggression toward others. Isolated following, charging but not making physical contact. Threatening/intense eye contact, screaming, banging on a door, disturbing the peace. Cursing at and/or spitting on someone (when no infection can be established). Behaviour does not change and/or escalate with redirection.

10 Mild aggression toward others. Approaching repeatedly without foul language, raising voice, slamming a door. Disrupting ongoing activity by barging in and/or grabbing things away to instigate. Noticeable psychomotor agitation. Not responding to requests to cease the behaviour. Not responding to redirection.
## Appendix F: Inter-rater Reliability

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Appendix G: Recommendations for the Regional Youth Forensics Service

Given this project was conducted with youth from the Regional Youth Forensics Service, as per the original agreement, the results were reported back to the service, and the recommendations that were discussed included the following.

In order to support further research into this population, the following recommendations are offered to the Regional Youth Forensics Service.

- A standard clinical document may be developed which includes the key risk factors for antisocial behaviour, including variables identified in this research as important. This will allow future research to have consistent and reliable data available for each youth.
- Clinicians may also employ a standard battery of psychometrics that can be routinely administered to young people, to ensure that data is collected consistently.

In regards to clinical practice, considering the majority of these young women had been subjected to at least one form of maltreatment, on assessment, it may be important to routinely assess their trauma histories, and trauma symptoms. The inclusion of psychometric measures such as the Childhood Trauma Questionnaire (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997) and the Trauma Symptom Checklist (Briere, 1996) may provide useful information.

As illustrated by the present study, awareness of the type of violence typically used (instrumental, reactive), relationship to the victim (family, community), and ethnicity may indicate certain avenues to explore in assessment and intervention.