

FAMILY AND PERSONALITY FACTORS IN JUVENILE DELINQUENCY

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By

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List of abbreviations

AL	Adolescence-limited
APQ	Alabama Parenting Questionnaire
APSD	Antisocial Process Screening Device
CBCL	Child Behaviour Checklist
CU	Callous-unemotional
FILE	Family Inventory of Life Events and Changes
FRS	Family Relationship Scale
GST	General Strain Theory
ICU	Inventory of Callous-Unemotional Traits
LCP	Life-course-persistent
NAS-PI	Novaco Anger Scale Provocation Inventory
SC	Self-Control
SIPA	Stress Index for Parents of Adolescents

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Abstract

The current study investigated relationships between youth offending, family factors, and personality factors. As a follow-up study to McLoughlin et al, one of the primary focus of this study was to examine whether callous-unemotional traits and aggression could predict offending. The second primary focus of this study was to determine whether family factors also predict offending in combination with callous-unemotional traits and aggression. Police records of 126 youths were obtained, and these were analysed along with the responses that were collected in the previous years during 2007-2010. Several theories involving crime and family factors were also addressed. The results revealed that callous-unemotional trait and aggression were both related to offending. Family factors, particularly ones related to parenting were correlated with youth offending and antisocial behavioural traits.

1. Introduction

1.1 Crime rates and prevalence

Official police statistical reports recorded that in New Zealand, the number of recorded offences is reported to be as high as 416,234 from May 2010 to June 2011. The number is estimated to be 947.5 offences per 10,000 population, which is the lowest in the years since 1995 (New Zealand Police, 2011). One of the age group which contributes significantly to recorded offences is early teenagers, who are classified as youths. Ministry of Justice (2012) reported that the crime rate is also dropping in youths, with apprehension rates decreasing from 43,225 to 33,481 during the years 2002 to 2011. Apprehension rates have reached 804 apprehensions per 10,000 population in 2011.

Prevalence in crime is the highest for teenagers, as New Zealand statistics also show that between youth aged 10 to 13 and aged 14 to 16, the latter group has a constant pattern of higher apprehension rates. This pattern is constant across demographic, place, and type of crime, as critically discussed by Hirschi & Gottfredson (1983). They stated that it is entirely possible that age alone is a strong predictor of crime. Moffitt (1993) also noted that rates of offending commonly peak at 17 years of age and that the rate drops significantly over the following three years. By the age of 20, the number of offences decreases by approximately 50%. This certainly applies to New Zealand statistics. In 2008, the overall police apprehension rate for non-traffic offences in the 17-20 year age group was 2,153 per 10,000 population. In contrast, the rate drops to 1,097 per 10,000 population for the 21-30 year age group. The group which has the third highest offence rates (following the 21-30 year age group) is the 14-16 years old age group. This young teenager group has offence rate of 1,572 per 10,000 population. Together, the adolescent groups of 14-16 and 17-20 accounted for more than half of the recorded offences that occurred in New Zealand.

1.2 Theories on delinquency

A number of well known theories on delinquency include Hirschi & Gottfredson's (1983) general theories, Moffitt's (1993) developmental taxonomy, and Agnew's (1992) general strain theory. Hirschi's (1969) control theory was linked to attachment to parents, with emphasis on parenting as a protective factor from delinquency. Hirschi & Gottfredson (1983) self-control theory is largely based on lack of resistance to commit a criminal act given the circumstances. Low self-control has been found to be associated with low parental monitoring and discipline. Moffitt's (1993) theory is based on a set of neurological factors and developmental factors which housed the tendency for youths to become chronic criminals. Among chronic youth offenders, they are mostly found to have problematic family relationships. Agnew's (1992) general strain theory included the lack of prosocial model, which in most cases should be a parental figure, which is then also related to poor relationships with parents. Most delinquency theories would mostly always include family influences and importance of relationships with parents. Family influences have been found to be a large contributing factor in delinquency since early theories, and there are large amounts of researches supporting this.

1.2.1 *Agnew's General Strain Theory*

GST's main concept related to criminology is that if a person cannot obtain or achieve their goals in life through legitimate ways, they possibly turn to illegitimate ways, or crimes, in order to achieve them. The strain itself starts from the pressure to succeed, and they are hindered from legitimate ways to obtain such goals. The GST is largely based on a series of number of negative life experiences which then affects the individual, and in some instances would drive them to delinquent acts as a way to justify or obtain their goals.

Agnew (1992) explained that the theory started from social learning theory and social control. Some of the important causal factors to this theory are accounted to absence of prosocial models. Parents and caregivers are primarily the first models that youths can relate to, and if the models are absent, it becomes a starting point for the rest of the development process; and early lack in positive relationships with parents. It would then likely results in unsupervised children and inappropriate, unconventional beliefs. As a result, children associate with and learn from delinquent, adopting them as models. With antisocial influences they are more likely to adopt delinquent methods to “succeed”.

He stated that there are three main types of strains which can be related to delinquency. First is that an individual’s failure to achieve positively valued goals, second is that the positive stimuli is removed, third is that the negative stimuli is presented to them. These are elaborated as follows:

1) An individual’s failure to achieve positively valued goals

This strain is due to disjunction between the steps of achievement. The thoughts concerned with achievement are divided into three large categories: 1) aims to actual/expectation of achievement; 2) expectations and actual achievement; then 3) fair outcomes and actual outcomes. Agnew discussed that the disjunction of the outcome, reality, and whether the outcome was fair or deserved, is what mainly speaks for this strain. The frustrations that stemmed from getting outcomes in an unsatisfactory manner could serve as a precursor to delinquent behaviours.

2) Removal of positively valued stimuli from the individual

This is focused on the loss of valued stimuli. Ones of the most vivid examples would be a loss of loved one, and separation of parents. These events are counted as negative

life events, and are linked to delinquency by acts which follow the events. Some examples include resorting to delinquency in order to protect/obtain the positive stimuli, acts of revenge on those responsible for the loss, or coping with the loss by usage of drugs. Although these are merely speculations and Agnew admitted so, he noted that loss of positive stimuli has been found to be related to delinquency.

3) Presentation of negative stimuli

The presentation of negative stimuli is not the direct cause of delinquency, but it is the ways youths attempt to escape from the stimuli. Those who are faced with such negative stimuli would then attempt to escape or get rid of the stimuli, or seek revenge to the source of the negative stimuli, or cope by using drugs. Some negative stimuli (or circumstances/events) which precede delinquent acts include child abuse/neglect, physical punishment, negative relationships with parents/peers, negative experiences at school, and negative life events.

How exactly do negative strains shape adolescents? Adolescents are thought to be less capable of dealing or relieving life stressors appropriately. They are thought to be more likely to turn to delinquency to relieve them of their stress from all the strains. Agnew stressed the main concept of the GST on *anger*. Anger is a result of strains which are placed on them, causing them to blame others, houses the willingness to seek revenge, and hinders the inhibition and reasoning. This lone emotion is the key to aggression, and delinquency.

Validity of GST has been tested by Agnew & White (1992) from the interviewed longitudinal data of 1,380 New Jersey adolescents at the age of 12, 15, and 18. The main measures in this study were of strain, social control, and differential association. For the strain measure, the items included were from stressful life events scales, and life hassles. This

measure only consisted of questions which are related to antisocial behaviours (for example; I smoke a lot of cigarettes). Other scales included are measures of relationships with parents, teachers, peers, and neighbours. They were intended to capture two of the main types of strain: loss of positive stimuli and/or experience of negative stimuli. Measures of parental control, school attachment, peer attachment, and school related influences were used as a social control measures. Association with delinquent peers scale was used as differential association theory measure.

The factors which supported GST from the results of this study were family, self-related, negative life events, and life hassles. These were also the main factors which were originally stated in Agnew's (1992) article on GST as one that were found to be associated to delinquency. Parental conflict and negative relationships with adults were also significant predictors of delinquency.

GST was further tested by Asetine, Gore, & Gordon (2000) on sample population of 9th to 11th grade students. The 1,576 selected students participated in a longitudinal study; they were interviewed 3 times during 1988 to 1990. This study focused the measures of anger, delinquency, drug use, relationships, and life stressors to measure the GST strains. A list of delinquent acts was compiled as a measure of delinquent activities. Family and peer relationship stresses and negative experiences measures were compiled from measures of stress.

Results from this study revealed that life stresses are significantly related to measures delinquency, aggression, and marijuana use. Family conflict and peer conflict were not directly related to delinquency, but they were mediated by other factors. The authors presented a structured model which suggested that family conflicts and peer conflicts would strongly be related to anger, and then anger strongly leads to aggression. Specifically, family conflict was reported to be more strongly associated with anger in youths with higher number

of delinquent peers. It is consistent with GST that family relationship/conflict plays a significant role in association with delinquency.

It is possible that there is a difference between males and females in exposure to, coping with, and response to negative strains. Hay (2003) tested the gender difference hypothesis with 182 adolescents (87 males and 95 females) aged 14 to 18 enrolled in an urban U.S. high school. The questionnaire was anonymous and self-administered. The study included scales which measured 5 family strains which were; physical punishment, parental rejection, parental psychological control (described as discouraging their children to express their opinions), unfair parental discipline, and residence in a nonintact family. Strains differ in the extent to which they predict delinquency. From these results, Hay (2003) concluded that physical punishment and parental rejection are the two factors that are most predictive of delinquency.

Hay (2003) also found that males in the study experienced more strains than females. The significant strain that males were more exposed to was physical punishment. This possibly indicated that males were more likely to become involved in delinquency than females due to the additional strain they are exposed to. Interestingly, the role of guilt was significant between genders. Females were more susceptible to feelings of guilt, which was then negatively associated with delinquency. As for males, they were more likely to respond to strains with anger, which most often precede delinquent acts.

Peers influences were also found to have a significant role in stress and strains. Hoffman (2010) explored application of GST on responses collected from the U.S. families with children aged 10-17. The number of delinquent behaviours in the previous year was used as the measure of delinquency. Stressful life events, self-esteem, and family relations measures were used as factors which may contribute to delinquency. Sex, family income, race/ethnicity, and family structures were used as control variables. The author found

stressful events to be associated with juvenile delinquent behaviours. It was also found that stressful life events association with delinquency was stronger in younger adolescents when compared to older adolescents. By the age of 20, the youths were found to have no association between stress and criminal behaviour. When the author added peer influence into consideration with age and stress, peer influence emerged as a stronger factor to delinquency than stress is to delinquency.

Higgins, Piquero, & Piquero (2011) proposed a role for peer rejection in the GST found in a longitudinal interview data of the starting age of 6-8 and concluded at 19-20. Specifically only measures of peer rejection and delinquency were used. They found some association between peer rejection in childhood and delinquency during adolescence, but this was only significant in males.

1.2.2 *Hirschi's Control Theory*

Hirschi's (1969) control theory of delinquency is a theory which is based on an individual's development of social and inner control, which then will reflect on that individual's actions in relations to delinquency. The theory includes concepts of broken relationships or lack of attachment to others, conformity to society, adjustment/belief in society's norms, and engaging in conventional activities.

The control theory marks its description of attachment on parenting, as appropriate parenting could serve as a barrier for children from antisocial exposures (Ingram, Patchin, Huebner, McCluskey, & Bynum, 2007). Much of the argument is based on development of superego. Parenting, proper discipline, and attachment to others give us constraints and lessons of social rules that we abide in order to cooperate peacefully with each other. Lack of attachment is also linked with lack of superego, or the inner control which should have been developed given that the individual had a form of bond or attachment with another individual.

An individual without any bond or attachment is prone to the route of alienation from others. The explanation to this is because without any attachment, the individual is also without any moral restraint, and thus led to violation of social acceptability.

Another concept in the control theory is commitment. If lack of attachment is linked with superego in this theory, commitment is linked to the ego. A sense of commitment in a person would act as armour against acts of crimes. Consider a case of someone who has invested his life in education, business, or other possession and fame. If he were to commit a crime, he would risk losing all of what he has. This is based on the assumption that the individual has led a conventional life, and that he would not risk his conventional possessions to a lesser act of crime that is valued less than what he already has. However, it is possible that there may be an error in this line of consideration and calculations of costs and benefits of action. Then this may lead to acts of crime.

The next concept of the theory is belief. In a society there are rules and most people in the society would obey them. However for some people, they do not have the same belief as the rest of the society, thus deviating from the norm. If they do not believe that they should obey the rules of the society, then they are more likely to commit delinquent acts. In some cases, it is possible to know that stealing is wrong, but still be able to steal. The argument here is that belief is a rather minor influence when weighed against others. If given the right circumstances, “reasons” and lack of other controls, having the correct set of beliefs would not prevent an individual from committing a crime. Other controls may include strains which drive the individual to acts of delinquency.

The other section of theory is based on engagement in conventional activities. The reasoning is that if the individual is too busy engaging in prosocial activities/behaviours, they are not likely to have the free time to engage in antisocial behaviours. This very concept drives the idea of keeping youths busy with some conventional activities to keep them out of

trouble. The other underlying reason to engage youth in conventional activities is because these activities provide means to serve youths' recreational interests and give more opportunities for them to engage in more conventional activities. Youths without the experience or opportunity to get involved in prosocial activities are limited in activities options.

1.2.3 *Gottfredson & Hirschi's Self-Control Theory*

Self-control theory, as part of a general theory of crime developed by Gottfredson & Hirschi (1990), is focused on the effects of parenting on self-control and delinquency. As a follow up to Hirschi's early control theory, the self-control theory further pinpoints low self-control as the primary cause of delinquency, and holds that it results from a lack of appropriate parenting. Individuals with low self-control are described as impulsive, insensitive, risk-taking, short-sighted, prefer simple tasks (e.g. physical over mental tasks), and self-centered. Individuals with low self-control are then more likely to be tempted to commit crime when the situation allows. In contrast, those with high self-control will be more resistant to commit crimes, even crimes that may have provided them with short-term satisfaction or pleasure.

Hay (2001) tested self-control theory on 14-18 years old high school students. The author found that self-control theory applies to the study population. Monitoring and discipline were negatively related to low self-control as the control theory states. However broader ranges of parenting factors were also related to self-control. Those factors include those which describe authoritative parenting style – parental involvement, use of fair/non physical discipline, and psychological autonomy granted to the child. Low self-control significantly affected delinquency in this study, but only partially mediated the effects of parental monitoring and discipline.

1.2.4 *Social Development Model*

The social development model is one that suggests that social elements that revolve around the child are influential to the child's behaviours. These include family, school, peer, and community elements (Hawkins & Weis, 1985).

This model was found to appropriately explain Chinese adolescents' delinquent behaviours for both males and females (Deng & Roosa, 2007). In their study, involvement in prosocial activities mediates family prosocial activities and perceived parental rewards. Perceived parental rewards then was found to be mediating prosocial activities and parental attachment.

1.3 Type of offenders

It is apparent at this point that adolescents tend to get into trouble. Moffitt (1993) further discussed that within these adolescent offenders, there are two groups. The author categorised the offenders who start offending early and are more likely to reoffend into the "life-course-persistent (LCP)" group. The second group starts offending later, and cease in early adulthood. This group, whose criminal behaviours cease as they mature, they are categorised as "adolescence-limited (AL)". It is described that the larger group of adolescent offenders are those whose antisocial behaviour only lasts during the adolescent period. The other smaller group is the group which will continue to offend past their adolescent period through to adulthood. This smaller group are often early childhood offenders (Moffitt, 1993; Moffitt, Caspi, Harrington, & Milne, 2002).

The differences between LCP and AL groups are such that LCP offenders' lives were started off negatively in various factors. Examples are biological, neurological, and family circumstances. Moffitt (1993) first introduced the theory as a taxonomy, which largely explains that LCP and AL groups differ in distinct category and characteristics in their lives.

The taxonomy approach has been challenged by some studies, such as one by Walters (2011) which found differences between LCP and AL to be more on severity/degree of the antisocial behaviours as opposed to clear cut categorical taxonomy differences. However, in most cases, there are marked differences between LCP and AL offenders which can be specified in factors.

Fergusson & Horwood (2002) defined trajectories on the sample population of 1,265 Christchurch children (635 boys, 630 girls) which have been followed up from birth periodically until 21 years of age. In Fergusson & Horwood's trajectory, there are five minor groups (but three of which are similar to Moffitt's theory) of youths which were classified based on their life stress and experiences. Three of the groups were consisted of low risk offenders, early onset adolescent-limited offenders, and chronic offenders.

The early onset AL offenders are the children who offended at approximate 13 years of age with low rates of conduct problems during childhood. The intermediate onset AL group also had low rates of childhood conduct problems reported, only they had offended at the age of 14-17 years. The late onset group trajectory is similar to the other AL offenders but around age 20. The chronic offender group is reported to have early conduct problems, which high rates of offending from age 11 to 17 with some decline at the age of 20. The difference between the chronic offenders and groups with low offending rates is that they differ in conduct problems during childhood. There is however no marked difference in trajectory development between male and female.

Childhood and adolescent trajectories have also been studied by van Lier, Wanner, & Vitaro (2007) in a sample of 361 children and adolescents aged between 6-15 years of age in Canada. Van Lier et al's results are consistent with Fergusson & Horwood (2002) in that the trajectory does not differ between the two genders. For low risk offenders, both studies reported higher female to male ratio (67-71% of females in the low risk group).

1.3.1 *Life-course-persistent (LCP) offenders (early onset persisters)*

As the name implies, life-course-persistent offenders are those who offend throughout their lives. Among offenders, they are most often the ones with a history of antisocial behaviour at various stages in their lives. They are more likely to engage in serious, violent offences than other subtypes (Moffitt et al, 2002). They are also likely to continue on to develop a criminal career. Moffitt (1993) proposed that LCP offenders can start off biologically different. A twin study by Edelbrock, Rende, Plomin, & Thompson (1995) found that monozygotic twins were found to share more emotional and behavioural problems. When compared to dizygotic twins, monozygotic twins tend to share more attention problems, social problems, and aggressive behaviour. Aggression in particular was found to be a strong inheritance by genetic, but not by shared environmental effects. On the other hand, delinquent behaviour was found to be affected by both genetic and environmental factors. If a child is born with a neurological deficit, or disorders that cause them to exhibit violent behaviours, they will pose a greater challenge to discipline than others without these deficits. Disciplining a child with conduct disorder or ADHD is without a doubt more challenging than a child without disorders. They are the ones with parents, guardians, and teachers would describe as problematic periodically and consistently since as young as 3 years of age.

As a consequence of having disruptive behaviours that are challenging to caregivers, they are not always given the most appropriate care. Children with problematic behaviours are not well received with their parents. Moffitt (1993) raised a common, but an interesting and important point that parents and child tend to resemble each other on personality and temperament. A child with challenging behaviours and parents who do not readily accept responsibility for them or give them proper discipline are likely to experience bumpy

development. For those reasons, there is likely to be disruptive home environment for the child.

Moffitt & Caspi (2001) analysed results from the Dunedin cohort of both males and females and found that LCP offenders had unsatisfactory backgrounds when compared to adolescence-limited (AL) offenders. The background risk factors that were included in this study, and on which the scores of the LCP group that were significantly higher than AL group include parental factors, social factors, and neurological factors. The LCP group were reported by parents and teachers as difficult to manage, hyperactive, and prone to exhibit violent behaviour. Family factors that were significant include; harsh disciplines, family conflict, change of caregiver, mother's mental health, mother's age at birth, and socioeconomic status. Consistent with Yessine & Bonta's (2009) study of an Aboriginal sample, those who were chronic offenders were found to have experienced major problems with their family relationships, association patterns, and drug/alcohol consumption.

As mentioned, youths who appear to be problematic may be subjective to a more disruptive home for several reasons. O'Connor, Deater-Deckard, Fulker, Rutter, & Plomin (1998) found that the parents applied negative control parenting towards their adoptive child that they know was at genetic risk for antisocial behaviour. In their study, parents of adoptive child with risk for antisocial behaviours and parents of adoptive child with no such risk were compared. It was found that negative control was present consistently in the family with the adoptive child at genetic risk for antisocial behaviours, and at a significantly higher level than the family with non at risk child. The study also found that the link between negative parenting and genetic risk child was partly mediated by the child's externalising behaviours.

1.3.2 *Adolescence-limited (AL) offenders (late onset desisters)*

Adolescence-limited offenders are described as individuals who only offend during adolescence period. As mentioned earlier, what we see in New Zealand statistics is that offence rates peak at adolescence period. The number then dramatically drops past the age of 20. We see a sharp increase in numbers in mid adolescence and we might wonder why this occurs. Moffitt (1993) explains this in terms of the “maturity gap”. For teens, during the period of biological transition from childhood to adulthood, it often happens at the same time as their social group transition. Most often the biological transition co-occurs with the transition from younger school age children to high school social circles. These maturing youths are faced with the teen group who had developed their delinquent ways to cope with this transition. The blame for blooming AL offenders is then put on the LCP offenders. The AL offenders copy the LCP offenders, who become their models for delinquent behaviours. Consider a simple trend and thoughts in a teenager; even if there are very few LCP offenders as it should be, that is enough for a start. As one teenager copies LCP offenders, more are likely to follow the trend.

However, unlike LCP offenders, these “learning” teenagers do not carry on offending beyond the transition teenager period. Moffitt (1993) suggested that after the maturity gap, for the AL offenders who wanted the acceptance of and identification with peer groups would move on from school to a different environment, thus separating them from the school antisocial peers. Initially they do not possess other internal and external factors which sustain delinquent behaviours, as LCP offenders do. They were more likely to have experienced stable development and been taught prosocial skills. More prosocial paths are open to them upon graduating from their adolescent period and passed the maturity gap. They have passed the heightened risk of exposure to antisocial peers in school, thus they have less motivation to persist on offending.

1.3.3 *Other subtypes*

Moffitt et al (2002) examined their male study population from the same Dunedin cohort at 26 years of age. As a continuation of their 1996 study, there are “Abstainer” and “Recovery” groups who do not follow either the LCP or AL path in entirety. The abstainer group is individuals who are isolated from their peer group, because they possess some characteristics that cause them to be excluded from peer groups by other teens. The abstainer group describe themselves as fearful, interpersonally timid, overcontrolled, socially awkward, and are virgins at the age of 18. The recovery group are those who exhibited extreme and persistent antisocial behaviours during childhood, but their antisocial behaviours ceased or decreased by the adolescence period.

The recovery group when compared to the LCP offender (which they should have become, according to their early onset), possess slightly lower levels of risk factors. It is not tested whether they are statistically significant from the LCP group, but their values on many variables are less. Notable factor are several social and psychological factors, including social isolation, which is significantly higher, and was the highest level recorded among groups in Moffitt et al (2002) study. Others are depressive episode, anxiety disorder, and social/agoraphobia. In contrast, the abstainer group was relatively free from psychological disorders.

1.4 Child risk factors

1.4.1 *Personality and environmental factors*

Factors found to be associated with juvenile delinquency include: substance abuse (Hoare, 2001; Case & Haines, 2001; Righthand & Welch, 2008), peer delinquency (Hoare, 2001; Chung et al, 2002), antisocial attitudes/behaviours (Case & Haines, 2007; Chung et al, 2002), low school achievement (Wong, Slotboom, & Bijleveld, 2010), and

attachment/involvement in school (Chung et al, 2002). Sutherland (2011) found that attachment/involvement in school can be negatively affected by poor environment and school settings.

Delinquency is likely to be encouraged by various factors which feed on or link to each other, not only one factor would be responsible for its development. Boers et al (2010) analysed possible pathways into development of violent adolescent delinquency. Hedonistic values is specified as the starting factor, and is followed by involvement with violent peer groups, which then leads directly to violent behaviour. The effects of these variables also vary by age. The effect of pro-violent norms is stronger before the age of 15, but decreases at age 15 and above. Violent peer group influences on violent behaviour is moderately to strongly influential during the age of 14 to 17. This may reflect the more general pattern whereby peers assume a much more important role during the adolescent years than in childhood or adulthood, when their importance as a source of social influence is less.

1.4.2 *Callous-unemotional (CU) traits*

The callous-unemotional (CU) traits are described as lack of empathy, lack of guilt, lack of interpersonal relations with others, lack of considerations for others, and expressions of feelings that are either lacking or shallow, or if present, are used for their own gain (Frick, Cornell, Bodin, Dane, Barry, & Loney, 2003; Frick & White, 2008; Frick, 2012). High levels of CU traits are more likely to contribute to development of conduct disorder (Frick, 2012) and also likely to be present in antisocial youths (Frick & White, 2008).

Studies have found indications of antisocial behaviours to be linked to CU traits. Frick et al (2003) found that in their study population of third and fourth grade school children; those with CU traits are found to have low level of behavioural inhibition in a reward dominance task. Children with both conduct problems and CU trait presents the most

concerning level of low behavioural inhibition. In a later study, Frick, Stickle, Dandreaux, Farrell, & Kimonis (2005) found in their four year longitudinal study that children with high level of conduct problems and CU trait were reported to have higher rates of delinquency than youth without this combination, and have the highest rate of police contact among youth in the study.

Essau, Sasagawa, & Frick (2006) found in their community sample that girls possessed lower levels of CU trait than boys in all age groups. Additionally they found that 15-16 year olds age group was found to have significantly higher scores for CU trait when compared to 13-14 and 17-18 year olds groups. They found that youths with CU trait were associated with having psychosocial impairment. Which indicated that they are likely to experience poor peer relationships and school performance.

High scores of CU trait were found to be significantly correlated with externalising behaviours, especially on uncaring subscale of the inventory. The majority of the CU trait scales were uncorrelated or negatively correlated with the internalising behaviour scale, which suggested that youths with CU trait tend to externalise their behaviour. Moreover, callousness was found to be significantly correlated with conduct disorder symptoms, and this is also identified as one of the risk factors in juvenile delinquency. Overall, callousness was found to be a significant predictor for antisocial behaviour in both boys and girls.

High levels of CU traits were found to be associated with higher levels of conduct problems (Hawes & Dadds, 2005). Kimonis, Frick, & Barry (2004) found that children with high reported levels of CU trait and conduct problems were found to have highest level of delinquent peer affiliation when compared to control group and the other group with only conduct problems. Children with only CU traits and without conduct problems were found to have second highest level of delinquent peer affiliation, this suggested that CU trait plays an important role in peer delinquency affiliation, regardless of conduct problems presented.

1.4.3 *Sex*

A number of personal and social factors determine youths' behaviours. One of the concrete risk factors is gender. Boys are mostly always found to be more at risk of offending than girls (e.g. Cassidy, 2011), and girls are found to exhibit less problematic externalising behaviour in general (Vandervalk, Spruijt, Goede, Maas, & Meeus, 2005). Meta-analyses of several international studies suggest that risk factors for delinquency in males and females are similar, although a few factors are found to be stronger for one gender than the other. For example, IQ was found to be related to female delinquency, whereas in males it was unrelated (Hubbard & Pratt, 2008). Similarly, females are affected by maternal relationships including parenting, relationships, and punishment, whereas males are not (Wong et al, 2010). Even though both genders seem to follow similar offending trajectories, the prevalence of male adolescents among chronic offenders is higher, and females are more prevalent in low risk offending group (Fergusson & Horwood, 2002).

There is some evidence that children's problematic internalising and externalising behaviours are affected by divorce in the family, and there are differences between males and females. Vandervalk et al (2004) found that in both boys and girls who were from divorced families were higher in problematic internalising and externalising behaviours when compared to youths from intact families. Girls from divorced families were higher in problematic internalising behaviours than boys, whereas boys from divorced families were higher in problematic externalising behaviours than girls. This suggests that girls are more likely to internalise their stress, and boys are more likely to externalise their behaviours as response to stressors. Thus, greater antisocial behaviour (externalising) in boys appears to be part of a more general pattern.

1.5 Family factors

As predicted by various researches (e.g. Loeber & Stouthamer-Loeber (1986); Klein, Forehand, Armistead, & Long (1997)), it is now widely accepted that family factors is a big contributing factor in the history of offenders. But their importance was overlooked during the very early years of criminology. Family factors are substantially influential in juvenile delinquency, specifically parental supervision and relationship with family (Mulligan, 1958; Hoare, 2001; Chung et al, 2002; Hoeve, Blokland, Dubas, Loeber, Gerris, van der Laan, 2008; Wong et al, 2010).

The Oregon Social Learning Center contributed much to theories involving the family and its link to delinquency. As Hirschi (1983) noted, scientists in the learning centre now realise that to discipline a child properly, the parent must monitor the child's behaviour, recognise the antisocial behaviour when it happens, and then apply appropriate punishment. Those steps are the conventional way of proper parenting in shaping the child to obey social norm and develop a sense of right and wrong. These were later stated as major cause of low self-control in Gottfredson & Hirschi's (1990) self-control theory. According to Gottfredson & Hirschi theory, for parenting to be effective it must be done appropriately prior to elementary school grades. The reason is because the concept of self-control is learnt during that particular stage of development.

Parenting and attachment is important because children learn interpersonal interactions, in most cases, first through their parents/caregivers. These interactions serve as learning to the child and feed into their development of thoughts. Problem solving skills, control of their feelings, and how they externalise them is learned first-hand from their models. Family is important in schooling the child to proper development.

1.5.1 *Family relationship*

Parental affection and positive family relationships are among the protective factors in delinquency (Mulligan, 1958; McCord, 1992; Andrews & Bonta, 2003). Adverse maternal behaviour (McCord, 1991), inappropriate parenting methods such as inconsistent discipline (Heimer, 1997; Farrington, 2011), and child abuse (Farrington, 2011) are risk factors. Positive relationships with parents is likely to be negatively associated with delinquency (Cassidy, 2011), and can be a protective factor, as in McCord's (1991) study; boys with affectionate and confident mothers are less likely to become delinquents. Significant correlations found in Tolan, Gorman-Smith, & Huesmann (1997) study for middle aged (14-16 years old) and older aged (17-18 years old) youths indicated that family cohesion and moral/religious factors within the family are negatively correlated to delinquency. These are further supported by the finding that conflict in the family is positively correlated with delinquency in the same study. Experiences of physical abuse, neglect, and witnessing family violence have often been found to be associated with sexual violence in juvenile offender (Righthand & Welch, 2008).

Poole & Regoli (1979) found that the weaker family support for the adolescent, the more likely that delinquent peers will influence the adolescent. Warr's (1993) findings are similar to Poole & Regoli (1979); as more of the adolescent's free time is spent with the family, the influence of friends on the adolescent is necessarily decreased. Surprisingly, the emotional closeness and communication levels between parents and adolescent were not found to be significant in lessening the influence of peers.

A longitudinal study by Henry, Tolan, & Gordon-Smith (2001) on family types and possibly associations with nonviolent delinquency suggested that there is a relationship between the two, but with other mediating factors. Family types were categorised into exceptionally functioning families (high levels of parenting practices, emotionally sound with

cohesion), task-oriented families (high level of parenting practices, but low in emotional warmth and low beliefs about importance of the family), struggling families (low parenting discipline, cohesion, beliefs in the family), and moderately functioning families (acceptable level of every practices, but not on either high or low end of the scales).

In their fully-mediated model, they found that there is a relationship between family types and youth's delinquency via the peer delinquency as a mediator. However their partially mediated model was a better fit to their data. The partially mediated model included paths where family types significantly predict violent peer delinquency, and violent peer delinquency is then associated with youth's nonviolent and violent delinquency. But there is also direct effect from family types to youth's delinquency. Overall, the results from this study indicated that families with effective methods of parenting and sound relationships is generally associated with lower possibilities of youth's association with violent peers, and therefore lower likelihood of delinquency. Families with low emotional attachment, high in deviant beliefs, and ineffective parenting was found to be associated with increased level of violent behaviour.

Johnson, Giordano, Manning, & Longmore (2011) found that low early parental support, overt conflict by parent, and parental monitoring are significantly related to offending during young adulthood. Peer delinquency was also found to be a mediator between delinquency and parental support. Furthermore, poor relationship with parents was found to be a contributing factor to association with delinquent peers.

Family support serves as a shield to an extent, however it does not seem to be effective when the adolescents are already among networks of delinquent peers. Simply put, when an adolescent has high levels of attachment and support with their family, they are less likely to be exposed to delinquent peers. But when they are exposed to delinquent peers, family bonds seem to be ineffective at that point.

1.5.2 *Parenting style*

Family relationship is directly influenced by parenting style. As parenting includes punishment and encouragement that caregivers directly administer to their children. As stated, negative family relationship would increase the likelihood of delinquency, and parenting style should also be one of the significant predictor. Parental supervision as part of parenting methods is usually the strongest predictor in juvenile offending (Farrington, 2011). Harsh and punitive discipline, including physical punishment (Farrington, 2011), neglectful parenting (Hoeve et al, 2008) are also predictive of juvenile delinquency. Neglectful parenting style distinguished between groups of youth offenders, where neglectful parenting style was found in serious youth offender trajectories (the study includes serious persisting, serious desisting, and moderate desisting) and the minor youth offender trajectories (minor persisting and nondelinquents).

The link between family relationship and parenting style/monitoring is often found to be associated with each other and effects the levels of delinquency. Johnson et al (2011) found that low early parental support, overt conflict by parent, and parental monitoring are significantly related to offending during young adulthood. Peer delinquency was also found to be a mediator between delinquency and parental support. Furthermore, poor relationship with parents was found to be a contributing factor to association with delinquent peers.

Ingram et al (2007) also suggested that family relationship/attachment affects levels of parental supervision. A significant mediating variable of parental supervision is significant between parental attachment and delinquency. It is an applicable finding, as positive relationships with parents are more likely to be monitored, and that lessens the chances of engaging with delinquent peers.

1.5.3 *Family structure*

Single-parent families as opposed to complete families set youths at higher risk for delinquency due to loss of attachment to one parent and less supervision (Chilton & Markle, 1972; Juby & Farrington, 2001; Wong et al, 2010). Ingram et al (2007) found that single-parent families reported lower parental supervision, however not all studies came to the same conclusion. Farnworth (1984) found that whether the child is reared by one or both parents hardly matters. Effects of divorce/separation in the family will be discussed in later section.

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deviant beliefs, and ineffective parenting was found to be associated with increased level of violent behaviour.

1.5.4 *Family life event/stress*

Theoretical explanations of how family transitions are associated with delinquency are offered by *trauma theory*, *life-course theory*, and *selection theory*. Trauma theories are derived from Bowlby's attachment theory where attachment to at least one parent is significant in the child's emotional, mental, and social development. Trauma theories hold that when a child experiences separation from a family member, for example a loss of a parent, the loss will leave an impact on the child. Such traumatic experience can affect self-regulation of the child as the result (Baer & Maschi, 2003).

Life-course theories are more focused on how events can shape or alter an individual's life. Number of traumatic events which happened with the separation all count towards heightened level of negative experiences. The theory does not focus only on the event of the separation, but it also takes into account of all other negative events that occur alongside. For example in an event of separation, other possible non-desirable events such as relocation and social adjustment are also counted as negative experiences. These are all added to the collective accumulation of stressful events which have occurred in an individual's life.

Selection theories suggest that family disruptions appear to be associated with delinquency because the negative events and factors that happened before the separation were present. For example, it may be commonly found that families undergoing a divorce/separation would have experienced lower family attachment, faced with disruptive relationships, and inadequate parenting methods were already present. Therefore it is because of those factors rather than the separation alone that were damaging and contributing to youth's risk of offending.

Juby & Farrington (2001) critically explored all three theories, and found that disruptions in the families are associated with delinquency in boys in the Cambridge cohort. Compared with boys from intact families, the percentage of the boys from disrupted families was higher in the following: juvenile convictions, self-reported delinquency, and adult convictions. Family conflict was also a predictor for juvenile convictions and self-reported delinquency in intact families.

It was found that disruptions that have an impact on youths are primarily those caused by family conflicts, and not those caused by death. Also boys from intact families but with high levels of family conflict (e.g. disagreement between parents or chronic tension) have similar rates of delinquency when compared to boys from disrupted families. This suggests that family conflict and family disruptions are both significant contributors to delinquency, and this finding seem to support selection theories.

In a further investigation on disrupted family study, the Swiss cohort was studied by Haas et al (2004) with particular emphasis on the group of participants who were affected by family disruptions before 12 years of age. The results found are quite consistent with Juby & Farrington's findings. High levels of family conflict and disrupted families were both contributing factors to delinquency. They also found that boys who lived with their mothers were just about as likely to offend as the group who lived in intact families but with high levels of conflict.

Krohn, Hall, & Lizotte (2009) found that boys who experienced family transitions were more likely to experience problematic peer interactions, then as a result, they are more prone to delinquency than boys who did not experience transitions.

Pagani, Tremblay, Vitaro, Kerr, & McDuff (1998) found that in boys belonging to about-to-be remarried families were less supervised when compared to boys whose families are intact. They did not find that boys from divorced families were at higher risk of

delinquency than boys from intact families, but rather, boys from about-to-be remarried families were. However the authors cautioned that the risk of delinquency may be temporary, and may lower when the family has gone through remarriage. Although the post-remarriage events and adjustments are factors to be considered, this study is in agreement with Johnson (1986) study which found that levels of delinquency is higher in families with a stepfather. This is likely due to the feelings of an outsider in the family, which may lead to alienation and parent-child relationship would then also be threatened.

Disruptions in a family can also impact parents who experience disruptive events. Mothers have reported parenting stress when there are disruptions or transitions in the family, specifically divorce or starting a new relationship (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). Parenting stress is likely to also affect parent-child relationship (Willinger, Diendorfer-Radner, Willnauer, Jorgl, & Hager, 2005)

1.5.5 *Low socioeconomic status*

It has been argued over the years that children in families with lower socioeconomic status tend to be more likely to commit serious crimes compared to children of higher socioeconomic status (Chilton & Markle, 1972). Other viewpoints and further exploration of this factor reveal more reasons as to why low socioeconomic status is more prevalent in offenders.

Heimer's (1997) is one of the studies that found a significant relationship between low socioeconomic status and violent delinquency. The author tested various explanations for the relationship, including possible greater association with delinquent peers, and abusive parenting (yelling, scolding, and hitting) of youths from higher-SES families. Heimer's results showed that parents of lower socioeconomic status were indeed more likely to use

physical/power-assertive punishment. As a result, discipline exposed youth to violence, unintentionally teaching youths that violence is an acceptable way to deal with problems.

Agnew et al's (2008) findings however suggested that low SES is not putting youths at high risk, but rather the economic problems that arise from it. They found that there was very little or no relationship between SES levels and delinquency, but they found high economic problems to be associated with delinquency. The economic problems in their study used a scale that focuses on problems such as paying bills, having to borrow money, having to change their home to a cheaper alternative. Economic problems were indeed found to be more prevalent in the low SES families, but this was also found in the higher SES families. Several reported numbers of economic problems were found to be strongly associated with drug abuse, parental reports of aggressive behaviours.

Galloway & Skardhamar (2010) further tested on the relationships between parental income and offending. The authors noted that previous studies on family SES and delinquency were often found to be non significant or weakly associated. In their study, they focused on analysing the relationships between various antisocial behaviours to different levels of parental income over the period of roughly 6-8 years from when the cohort turned 10 to the year 2004 in which the most updated data was available for the analyses. They found that the association was present only when they looked at long-term income, as opposed to short-term income. The reason, they suggested, is that taking a short snapshot of a family's income may not reflect the family's overall financial position. Additionally in this study, the authors were able to test parental educational level and socioeconomic status together. When parental educational level is not considered, the relationship between socioeconomic status and delinquency drops, and the levels that still predict delinquency are only the two lowest brackets in the income range.

1.6 Previous findings from the cohort

The current study will follow up a cohort of youth in a longitudinal investigation of at-risk youth (described below). The cohort has previously been studied by Head (2008), McLoughlin, Rucklidge, Grace, & McLean (2010), and Panckhurst (2010). Head (2008) found that parental influences contribute to the presence and levels of callous-unemotional traits. Namely, the parent's level of empathy, the parent's level of monitoring and supervision, and the family's parenting techniques, all predicted the level of CU traits among youth in the cohort. McLoughlin et al (2010) found that callous-unemotional traits and a measure of aggression (from the Child Behaviour Checklist (CBCL)) are both effective in identifying children with high levels of risk for antisocial behaviours. Panckhurst (2010) found that callous-unemotional and aggression were significant predictors for disruptive behaviours at school (these indicate early antisocial behaviours). It was also found in Panckhurst's (2010) study that when CU trait and aggression variables were combined in predicting early antisocial behaviour, the effectiveness of CU trait in prediction was reduced to non-significance.

1.7 Current study

Previous work on this cohort has relied on early indicators of antisocial behaviour, such as school disciplinary infractions. At the time of this study, the youth in the cohort were aged approximately 15-16, an age by which some are likely to have had police contact in connection with offending. Accordingly, their criminal records were obtained from the New Zealand Police. The criteria used in categorising youth offence data were that any occurrence which appeared in the record and where the youth was identified as "offender" and/or "suspect" was counted as an offence.

Youth's criminal records will be analysed in combination with parents' responses to a number of questionnaires related to family circumstances and functioning which were collected in 2007. These will be combined with previous findings of CU trait and aggression that were found to be significant predictors in antisocial behaviours in Panckhurt's (2010) and McLoughlin et al's (2010) studies. Of particular interest is whether 1) data on family and parenting factors adds significantly to the prediction of later delinquency measured as police contact, and 2) whether and to what extent the data available from the study support the different theories of youth delinquency, described above, that emphasise family and parenting factors.

2. Methods

2.1 Participants

A total of 126 youths were recruited from the low-decile schools, ranked 1-3, in Christchurch as part of a larger project that commenced in 2007 by McLoughlin et al (2010). The children were of approximately aged 10-11 at the start of the study. Primary caregivers of participated children also participated in the study accompanying the child's responses. Information of each child and their caregiver was collected at the initial start time of the study. Children and caregivers were given different sets of self-report questionnaires at both times.

2.1.1 Police records

Police records were obtained at the date of July 2012 and were given to the researcher as an anonymous data. No personal information other than birth date and sex were revealed to the researcher. All participants were assigned numbers 1 through to 126 for case by case data analysis purposes. Any youth who have records under the role of "offender" or "suspect" was recorded as offended. Any youth who have been charged was also recorded as offended.

2.2 Measures

2.2.1 Alabama Parenting Questionnaire

The Alabama Parenting Questionnaire (APQ, Frick, 1991) is a 42-item rated on a 5 point likert scale (never, almost never, sometimes, often, always). The questions are focused on relationships and interactions between child and parent. The domains include in the questionnaire are: parental involvement, positive parenting, poor monitoring/supervision, inconsistent discipline, and corporal punishment. Scores from parental involvement and positive parenting are counted towards the positive discipline/parenting. The latter three

measures are assessments of negative discipline/parenting. APQ also features 7 items which specifies on discipline practices rather than corporal punishment.

Psychometric properties of the APQ has been tested by Essau et al (2006), which is reported to be reliably associated with conduct problems, which is the primary APQ properties of measuring and detecting parenting practices problems.

2.2.2 Family Inventory of Life Events and Changes

The Family Inventory of Life Events and Changes (FILE, McCubbin, Wilson, & Patterson, 1983) assesses life events and stresses in the family. The inventory consists of 171 self-report items which focus on stressors and life events which occurred in the family within the past 12 months. The required response to the items is either “yes” or “no”. The inventory is separated into 8 sub-categories which include development and relationships, extended family relationships, work, management and decisions, health, social activities, finances, and law. The overall scale reliability of this scale is reported to be acceptable, and it is suggested that the total scale of the score be used rather than using subscales individually due the low and highly varied alpha value (.30 to .73) (Grotevant & Carlson, 1989).

2.2.3 Stress Index for Parents of Adolescents

The Stress Index for Parents of Adolescents (SIPA, Sheras, P. L. & Abidin, R. R., 1998) is an extension of the Parenting Stress Index (PSI). SIPA is a screening tool which assesses stressors in parent-adolescent relationship. The main purpose is to assess parenting stress as their child is growing from childhood to adolescent period. The inventory is to be administered and responded by a parent/caregiver of 11-19 years youth. The SIPA consists of 112 items, where the first 90 items are to be rated on a 5-point scale (1 is strongly disagree, 5

is strongly agree) and the remaining 22 items measures life stressors which have occurred in the past year, and the response required is either “yes” or “no”.

The first section of SIPA is separated into Adolescent Domain and Parent Domain. Adolescent Domain comprises of 4 subscales of moodiness/emotional lability, social isolation, withdrawal, delinquency/antisocial, and failure to achieve or persevere, each of these subscales has 10 items each. Parent Domain also consists of four subscales of life restrictions, relationship with spouse/partner, social alienation, and incompetence/guilt, each of these subscales has 7-10 items each. Interaction of parent-adolescent is grouped in a separate 16 items which measures adolescent-parent relationship.

The reliability of SIPA subscales is high. The alpha values are reported to be .81 to .90 for the subscales, and for the adolescent, parent, adolescent relationship domain, and total parenting stress exceed .90 (Touliatos & Perlmutter, 2001).

2.2.4 Family Relationship Scale

Family Relationship Scale (FRS – Tolan et al, 1997) measures six aspects concerning family relationships. These aspects are beliefs about family, cohesion, shared deviant beliefs, support, organisation, and communication. The questionnaire consists of 61 items and can be rated by either one or two parents. The response for each item is in a form of choosing the score that applies most to the family on a 4 point scale (A – not at all true to D – almost always or always true). Its cronbach’s alpha ranges from 0.54-0.87 on all subscales.

2.2.5 Inventory of Callous-Unemotional Traits

Inventory of Callous-Unemotional Traits (ICU – Frick, 2003) is a 24 item questionnaire which is designed to measure callous-unemotional traits in youth. Each item is to be rated on a 4 –point likert scale (0 – not at all true to 3 – definitely true). The higher

score represent higher levels of CU traits. This inventory has children, parents, and teachers version. The ICU is developed as a specific inventory to measure the CU traits, as the APSD also has a subscale for CU traits, however it has been mentioned that it is limited to six items, therefore making the subscale difficult to be an accurate measure of CU trait (Essau et al, 2006).

The ICU has been tested on its reliability and validity in Essau et al (2006) on a sample population of 1,443 adolescents enrolled in grade 7-10, age ranged from 13-18 year in Germany. They found that the ICU captured three dimensions of the CU traits, which include callousness, uncaring, and unemotional.

2.2.6 Child Behaviour Checklist – Aggression subscale

The Child Behaviour Checklist (6-18 years) is designed to measure children's problem behaviours. The scale that is used in this study is the aggression subscale in the CBCL. The parent report form consists of 18 items of short description of problematic behaviours (e.g. argues a lot, suspicious, gets in many fights) to be rated on a 3 point likert scale (0 – not true as far as you know, to 2 – very true or often true). Higher scores will represent higher levels of aggression. The scores obtained will then be converted to standardized t scores.

2.2.7 Conners Rating Scale

Conners Rating Scale-Revised (CRS-R, Conners,) includes versions for the adolescent self report, parent, and teacher. They are used to assess ADHD and related problems in 3-17 years old children. The adolescent self report scale consists for 87 items on 7 subscales: family problems, DSM-IV symptom subscales, emotional problems, conduct problems, cognitive problems/inattention, hyperactivity, and ADHD index. The short form

consists of 27 items with the latter four subscales mentioned. The long version of parent scale contains 80 items with 10 categories of oppositional, cognitive problems/inattention, hyperactivity, ADHD index, anxious-shy, perfectionism, social problems, DSM-IV symptom subscales, Conners' global index, and psychosomatic. The short version contains 27 items and only includes the first four categories mentioned. Teacher version of the scale contains 59 items with all the same categories as the parent version except the psychosomatic category. The short version of the teacher version contains 28 items with only the first four categories mentioned in the details of the parent version.

2.2.8 Novaco Anger Scale Provocation Inventory

The Novaco Anger Scale Provocation Inventory (NAS-PI – Novaco, 2003) contains two parts. The first part, NAS, contains 60 items designed to assess three main factors: cognitive, arousal, and behavioural to be rated on a 3 point-likert scale (1 – never true to 3 – always true). The second part, PI, contains 25 items which is related to anger provoking hypothetical situations, to be rated on a 4 point likert scale (1 – not at all angry to 4 – very angry).

2.2.9 The Individual Protective Factors Index

The Individual Protective Factors Index (IPFI – Springer & Phillips, 1992) is a 71 item self administered questionnaires designed to measure adolescent's (aged 10-16) resiliency, including social bonding, personal competence, and social competence as three major domains of the questionnaire. Each question is a statement for the adolescent to agree with whether or not it applies to themselves, and each is to be ranked on a 4 point likert scale (1 – as a strong disagreement to 4 – as a strong agreement). The IPFI has been tested on its reliability and validity by the authors on a sample population of 2,416. It is claimed to have

cronbach's alpha values of .48 to .65 on all three domains, bringing up the total of .95 for the whole questionnaire.

2.2.10 *Interpersonal Reactivity Index*

Interpersonal Reactivity Index (IRI – Davis, 1980) is a 28 item self-administered questionnaire designed to assess empathy. There are four subscales in the questionnaire which includes perspective taking, fantasy scale, empathic concern, and personal distress. Each of the subscale contains 7 items to be ranked on a 5 point likert scale (1 – does not describe me well to 5 – describe me very well). Davis (1983) has assessed how well each subscale in the IRI measures empathy by correlating them to other psychological measures, and they fared well in measuring empathy as a whole.

2.3 Data treatment and analysis

Data analysis was completed using STATISTICA 9, SPSS 19.0, and AMOS 20. Analysis included descriptive statistics, Pearson bivariate correlations and the inter-correlations between family variables, offending, CU traits, and aggression. Theories on delinquency were each examined by Pearson bivariate correlations. Theories that included significant correlations were then tested with structural equation modelling and mediator analysis to determine the strength of the relationship and the validity of the models. Logistic regression was used to test on the predictive strength of CU traits and aggression, and also their strength in combination with family variables.

Family variables were selected from some of the questionnaires included in this study. Only parents responses were included in these variables. The reason is because parents are likely to be the best source for family overview and responses as compared to child or teacher. The family variables included were:

- 1) Five measures from the APQ: parental involvement, positive parenting, poor parental monitoring, and inconsistent discipline.
- 2) Total stressors score from FILE.
- 3) Three subscales from SIPA: negative adolescent-parent relationship, total parenting stress, and life stressors.
- 4) All six subscales from FRS: beliefs about family, cohesion, shared deviant beliefs, support, organisation, and communication.

3. Results

3.1 Descriptive statistics

A dichotomous variable was created for offending, with the value of “1” assigned to youths who have offended according to the following criteria: 1) had any police record for a role in any reported crime as “offender” or “suspect”, or 2) had been charged and cases processed in court. Youths who did not meet these were assigned with the value of “0”. Table 3.1 presents the number of offending youths, categorised by sex.

Table 3.1
Offending statistics categorised by sex

		Sex		Total
		Female	Male	
Offending	No	52	40	92
	Yes	24	10	34
Total		76	50	126

From Table 3.1, 20% of males have offended, and for females the percentage is 31.58%. Overall, 27% of youths have offended according to the criteria described above. Comparing the overall frequency of offending in these youths aged 15-17 to the national apprehension rates for the 14-16 year old group (1,562 per 10,000 population, or 15.62%), it is evident that offending was higher in this study. This was expected because this study consisted of youths who were enrolled in schools which are located in low SES neighbourhoods. The frequency of offending among females in this sample was greater than that for males. This is rather unusual, in that crime is normally found to be more prevalent among male youth.

Table 3.2 shows descriptive statistics for the questionnaires completed by parents. Also shown in Table 3.2 are the published norms for the questionnaires. Generally, APQ scores were similar to the available norms (of 7-9 year old Australian children). There are notable differences for some of the APQ scores, however. Whereas parental involvement,

discipline, and positive parenting were relatively close to the norms (0.78% - 5.92% difference from the norm), parental monitoring and corporal punishment were markedly different. The present sample scored 17.08% and 30.07% higher, respectively.

Table 3.2
Descriptive statistics of variables included in this study, along with the norms (where available).

Scale	Variable	Valid N	M	Minimum	Maximum	SD	Norm M (SD)
ICU	CU traits score	120	28.84	4	67	14.65	
CBCL	Aggression	119	57.39	50	94	10.37	
APQ	Parental Involvement	119	38.16	28	50	4.99	40.42-40.67 (4.43-4.13)
	Positive Parenting	119	25.47	17	30	3.20	25.67-25.94 (2.64-2.66)
	Poor Parental Monitoring	119	14.81	10	41	5.04	12.28-12.4 (2.89-3.36)
	Inconsistent Discipline	119	14.03	6	26	4.19	13.9-13.97 (3.3-3.92)
	Corporal Punishment	119	4.29	3	9	1.53	5.58-5.34 (1.53-1.61)
	FILE	Total score	91	469.96	0	1657	348.32
SIPA	Neg. adol-par relations	89	51.87	35	94	20.84	Within normal limits
	Total Parenting Stress	84	53.73	0	98	26.62	Within normal limits
	Life Stressors	92	68.46	0	99	23.39	Within normal limits
FRS	Beliefs About Family	90	1.58	1	3	.42	3.5 (0.4)
	Cohesion	90	3.15	1.67	4	.47	3.26 (0.49)
	Shared Deviant Beliefs	90	3.76	1	4	.50	1.37 (0.43)
	Support	90	3.25	1.5	4	.53	3.11 (0.57)
	Organisation	90	3.39	2.17	4	.48	3.35 (0.51)
	Communication	90	3.06	1.67	4	.62	3.13 (0.62)

Mean FILE total score for the study sample is within moderate range, and its maximum falls in the high range. This signified that moderate levels of stress are likely to be present in most of these families, although high levels of stress are evident in 6.72%. The majority of FRS subscale means are comparable to the norm, except beliefs about family, which is considerably lower. Shared deviant beliefs are also significantly higher than the norm.

SIPA raw scores are converted to percentages. The norms for these subscales were based on the US sample. The mean for the adolescent-relationship subscale was 51.87. This is considered to be within normal limits. Out of 89 valid participants, 4 scored in the “clinically significant” range and 6 scored in “borderline” range. For total parenting stress the mean was 53.73, which falls within the normal range. Out of 84 participants, 7 scored in “clinically severe” range, 5 scored in “clinically significant” range, and 6 were in the “borderline” range on this subscale. For life stressors, 21 out of 91 scored in “clinically severe” range, 5 scored in the “clinically significant” range, and 3 scored in the “borderline” range.

A substantial number of parents reported their life stressors to be in a clinically severe to clinically significant range. Whereas for the adolescent-parent relationship subscale, the number reported in these clinically affected ranges were not particularly high.

3.2 Relationships among variables

The primary goal was to assess how family variables might be related to antisocial behaviours, in this case it is offending. In the previous study, CU traits and aggression were found to be associated with antisocial behaviours. Therefore in this study, offending, CU traits, and aggression will be looked at alongside family factors in order to determine possible underlying relationships among them. Inter-correlations among the variables were computed as follows.

Table 3.3

Correlation matrix among offending and family factors

Scale	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1. Offending	-														
APQ	2. Parental Involvement	-.16	-													
	3. Positive Parenting	.01	.62**	-												
	4. Poor Parental Monitoring	.16	-.05	-.06	-											
	5. Inconsistent Discipline	.15	-.15	.00	.46**	-										
	6. Corporal Punishment	.01	-.21*	-.15	-.03	.26**	-									
FRS	7. Beliefs about family	.03	-.16	-.17	.24**	.10	-.00	-								
	8. Cohesion	-.22*	.25**	.10	-.13	-.24**	.10	-.21*	-							
	9. Shared Deviant Beliefs	.18	-.16	-.13	-.17	-.20*	.09	.03	.04	-						
	10. Support	-.09	.05	.07	-.32**	-.35**	.03	.09	.30**	.33**	-					
	11. Organisation	-.04	.10	.04	-.20*	-.23*	-.05	.07	.16	.35**	.62**	-				
	12. Communication	-.18*	.17	.16	-.18	-.27**	-.03	-.23*	.60**	.07	.23*	.29**	-			
FILE	13. Total stressors score	.30**	-.09	-.07	.02	.11	.26**	-.15	-.12	-.02	-.29**	-.41**	-.27**	-		
SIPA	14. Neg. adol-par relations	.13	-.25**	-.15	.26**	.34**	-.01	.22*	-.43**	-.03	-.35**	-.32**	-.44**	.04	-	
	15. Total stressors	.21*	-.20*	-.11	.19*	.23*	.08	.06	-.40**	-.18*	-.48**	-.39**	-.40**	.23*	.71**	-
	16. Life stressors	.15	-.03	-.01	.19*	.15	.23*	.00	.03	.02	-.21*	-.18*	-.14	.53**	.09	.18

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

Table 3.4
Correlation matrix among CU traits, aggression, offending, and family variables

Scale	Variable	CU traits	Aggression
	Offending	.19*	.32**
APQ	Parental Involvement	-.16	.03
	Positive Parenting	-.23*	.08
	Poor Parental Monitoring	.34**	.28**
	Inconsistent Discipline	.34**	.38**
	Corporal Punishment	.02	.08
FRS	Beliefs about family	.14	.05
	Cohesion	-.23*	-.07
	Shared Deviant Beliefs	-.05	.03
	Support	-.31**	-.14
	Organisation	-.22*	-.19*
	Communication	-.31**	-.25**
FILE	Total stressors score	.03	.11
SIPA	Neg. adol-par relations	.51**	.42**
	Total stressors	.53**	.38**
	Life stressors	.12	.15

* $p < .05$

** $p < .01$

Table 3.3 focuses on offending and family variables. It is apparent that not many family variables were significantly correlated with offending. Among 15 family variables, 4 were statistically significant. These are shared deviant beliefs, communication, FILE total stressors score, and SIPA total stressors. Other parenting and family relationships variables were not statistically significantly correlated with offending. In general, stressors which are affecting the family (including stressful events), poor communication, and shared deviant beliefs are more clearly associated with offending than parenting and other relationship factors.

Table 3.4 focuses on CU traits and aggression in relation to offending and family variables. CU traits was significantly correlated with offending. Aggression was also significantly correlated with offending, and its relationship to offending was stronger than CU traits is to offending. Interestingly, CU traits was significantly correlated with a large number of family variables. On parenting variables, there were significant correlations with

positive parenting (negative), poor parental monitoring, and inconsistent discipline (both positive). CU traits was also correlated with a large number of relationships variables. Among these are cohesion, support, organisation, and communication (all negative). CU traits was also highly correlated with negative adolescent-parent relationship and SIPA total stressors.

Aggression was positively correlated with negative adolescent-parent relationship, SIPA total stressors, poor parental monitoring, and inconsistent discipline. It was also negatively correlated with communication and organisation. Aside from three main variables of interests, there were significant correlations between family variables. In general, positive parenting practices were found to be positively correlated with positive family factors, and negatively correlated with negative factors. SIPA total stressor in particular was negatively correlated with all of the FRS variables except beliefs about family.

To examine relationships among variables further, this matrix is broken down into sections that are relevant to the theories of youth delinquency reviewed in the introduction. To assess these theories, a number of additional variables were introduced at this point. These include scores from NAS-PI, interpersonal reactivity index, protective factors questionnaire, APSD, Conners rating scale, Colours Trails Test, and the individual protective factors index. Results from all of these scales were available from the “parent” study (McLoughlin et al, 2010), and were introduced here because of their usefulness, in addition to family factors, in relation to the theories. Items included for each theory will be identified in the sections below.

3.2.1 Agnew's General Strain Theory

Agnew's GST proposed that several negative events, circumstances, and strains would affect youths' emotions. Negative experiences might be handled poorly by the youths affected, result in anger, leading to aggression, and thus delinquency. Most of the factors in this theory are largely based on family matters, but include peer and school related matters.

The available data permit only a partial test of the theory. Using subscale scores, and sometimes individual items from the questionnaires, plausible variables could be constructed for the following: negative life events, parental conflict, and negative relationships with adults. New variables were made using standardised scores on relevant items, which were then averaged to produce a new variable which represents the factor.

For the "negative life events" variable, 2 items from FILE were combined (18 – Spouse/parent was separated or divorced, and 19 – Spouse/parent has an affair). These items are related to negative life events as Agnew commented that parental relationship and breakups are counted as negative events for youths. For "parental conflict" one item from FILE (5 – increase in conflict between husband and wife) and two items from SIPA (60 – My spouse/partner often hurt my feelings, 68 – I often need to work hard to avoid conflict with my spouse/partner) were combined. For "negative relationships with adults", one item from FILE (6 – Increase in argument between parent(s) and child), three items from SIPA (5 – My child shows affection towards me, 40 – My child likes to do things with the whole family, 89 – I cannot get my child to listen to me), and one item from protective factors questionnaire (14n – Argued with your parents) were combined as described above. Two measures from SIPA (5 and 40) were positive measures. They were negatively coded prior to combining them into "negative relationships with adults".

Total score of NAS-PI was used as an anger variable, and CBCL aggression subscale was used for aggression. The inter-correlation matrix for this set of variables is given in Table 3.5.

Table 3.5
Correlation matrix among offending and negative factors/strains

Variable	1	2	3	4	5
1. Offending	-				
2. Negative life events	.08	-			
3. Parental conflict	.03	.26*	-		
4. Neg. Rel. w Adults	.10	.04	.02	-	
5. Anger	.26*	.02	.12	.04	-
6. Aggression	.32**	-.10	.00	.06	.48**

* $p > .05$

** $p > .01$

From Table 3.5, offending was positively correlated with anger and aggression. Anger was also significantly positively correlated with aggression. Other variables were not strongly correlated to any of these three, which suggested that these variables have little or no effect on level of anger and aggression. Note that although negative events and parental conflict were correlated with each other, this may be due to the nature of the questions used to construct the negative life events variable, which were directly linked to parental conflict.

3.2.2 Gottfredson & Hirschi's Self-control Theory

The self-control theory proposed that lack of appropriate parenting is related to low levels of self-control. People with low self-control are more likely to be tempted commit crimes, thus heightened the chance of offending. We constructed a new variable, "self-control deficit", to represent lack of self-control. Individuals with lack of self-control are described by Gottfredson & Hirschi to be impulsive, risk-seeking, and self-centred. Measures of impulsivity were readily available in the data set, and self-centredness could be constructed, but we could not construct risk-seeking due to limited relevant items in the available data.

The new variable “self centredness” was constructed from two measures taken from the interpersonal reactivity index. Specifically, measures of perspective taking and empathic concern were standardised, averaged, and then reverse coded to produce a variable which represents self-centredness. Impulsivity was constructed from the impulsivity subscale of the ASPD, and the restlessness/impulsivity subscale of the Conners rating scale. Finally, all of these variable/subscale scores were standardised, then averaged to produce the *self-control deficit* variable. Parenting variables used were the five subscales from the APQ: parental involvement, positive parenting, inconsistent discipline, and corporal punishment. Table 3.6 gives the inter-correlation matrix for this set of variables.

Table 3.6
Correlation matrix of offending, self-control deficit, and parenting variables

Variable	1	2	3	4	5	6
1. Offending	-					
2. Self-control deficit	.35**	-				
3. Parental involvement	-.16	-.05	-			
4. Positive parenting	.01	-.08	.62**	-		
5. Poor par. monitoring	.16	.35**	-.05	-.06	-	
6. Inconsistent discipline	.15	.45**	-.15	.00	.46**	-
7. Corporal punishment	.01	.11	-.21*	-.15	-.03	.26**

* $p < .05$

** $p < .01$

Table 3.6 shows a significant correlation between offending and self-control deficit, and significant correlations between self-control deficit and two of the parenting variables. The significant correlation between self-control deficit and offending is consistent with Gottfredson and Hirschi’s theory in which self-control deficits are of central importance. Parenting factors that were significantly correlated with self-control deficit were parental monitoring and inconsistent discipline. Parental involvement and positive parenting were strongly inter-correlated, and both show negative correlations with self-control deficit (as would be expected) but neither correlation was significant.

Among the family factors correlations, inconsistent discipline was positively correlated with poor parental monitoring and corporal punishment. Parental involvement was negatively correlated with corporal punishment, and was positively correlated with positive parenting. Parental involvement was negatively correlated with corporal punishment.

3.2.3 Moffitt's Life Course Persistent trajectory

The LCP trajectory that Moffitt proposed stressed the neurological deficit often found in LCP offenders. Other factors found in LCP offenders more so than AL offenders are parental factors and social factors. A consistent factor found in LCP offenders relates to problematic family relationships (conflict), and harsh discipline, as they are related to disruptive home environment possibly due to the child's neurological deficit.

The Interference index score from Colour Trails Test (a measure of attention and concentration deficit) were used as an indicator of neurological deficits. The negative relationships with adults variable that was previously created was used to represent problematic family relationships, and corporal punishment subscale from APQ was used to represent harsh discipline. Table 3.7 presents the correlation among variables in this theory.

Table 3.7
Correlation matrix of offending, attention/concentration deficit, negative relationships with adults, and corporal punishment

Variable	1	2	3
1. Offending	-		
2. Attention/concentration deficit	.08	-	
3. Neg. Rel. w Adults	.01	.04	-
4. Corporal punishment	.01	-.12	.09

The figures in Table 3.7 indicate that attention/concentration deficit, negative relationships with adults, and corporal punishment are not, or were only weakly, correlated with each other.

3.2.4 Delinquent Peer Association

Association with delinquent peers is one of the leading factors found to be associated with delinquency. This is most often found to be correlated with CU traits, adverse parenting methods, poor family relationships, and low parental support. This was tested by producing a new variable, peer delinquency. This was created using two items from the protective factors questionnaire (15d – (peer) drinks alcohol once in a while, and 15e – (peer) tries illegal drugs once in a while). These two items were standardised, then combined and averaged to produce the variable for peer delinquency.

CU scores from the ICU were used as CU traits variable. Positive parenting subscale from the APQ was used as parenting methods variable. Negative relationships with adults previously created in this study represented the family relationships, and the support subscale from the FRS represented parental support. Table 3.8 lists the correlations among all the stated variables.

Table 3.8
Correlation matrix for offending, delinquency, peer delinquency, CU traits, and other family factors

Variable	1	2	3	4	5
1. Offending	-				
2. Peer delinquency	.01	-			
3. CU trait	.20*	-.18	-		
4. Positive parenting	.01	-.04	-.22*	-	
5. Neg. Rel. w Adults	.10	.01	-.03	-.13	-
6. Family support	-.10	-.03	-.34*	.07	-.17

* $p < .05$

From Table 3.8, it can be seen that peer delinquency was not strongly correlated with any variable. This suggested that peer delinquency is not related to delinquency. However it should be noted that the responses in this study were obtained at a young age and peer delinquency may not have been apparent at that age. Other significant correlations can be seen for CU trait negatively correlated with positive parenting and family support. These two

pairs suggest that a family using with positive parenting and with a high level of family support is less likely to have child with CU trait present.

3.3 Model development and testing

Section 2 presented correlations for Agnew’s GST, Gottfredson & Hirschi’s Self-control Theory, and Moffitt’s LCP trajectory. However there was no significant correlation between variables of interest in the LCP trajectory, therefore it was not pursued further in this section. Some of the correlations in GST and self-control theory were statistically significant. As a continuation of theory testing for GST and self-control theory, this section investigates further the possible underlying relationships between variables created to test both theories in the previous section. The overall approach uses three steps: 1) create models based on these theories, using factor analysis for data reduction, and then 2) test for mediation, using multiple regression. In Step 3, promising models are confirmed using structural equations modelling.

3.3.1 General Strain Theory

The path for the GST is illustrated in Figure 3.1.

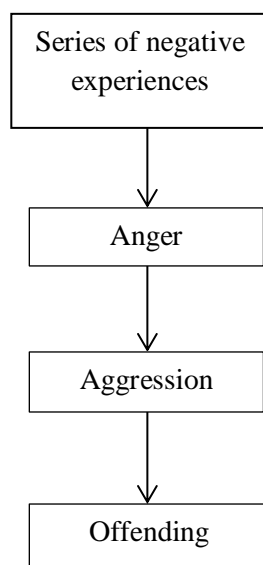


Figure 3.1. General strain theory model path

The GST proposes that a series of negative experiences is likely to lead to anger, which in turn leads to aggression, and offending is the final step in the path.. This theory thus proposes that anger and/or aggression could be the mediators of the relationship between negative experiences and offending.

1) Factor analysis for Negative Experiences

Negative experiences comprised of 10 items taken from the FILE, SIPA, and Protective Factors questionnaire, as explained in the previous section. These items were then entered into factor analysis using varimax rotation with Kaiser normalisation.

The initial factor analysis output with 10 items included revealed that there were 4 components with eigenvalues greater than 1.0. Examination of the scree plot showed that the first two factors were on a much steeper slope than the latter two factors, which appeared to lie on the same line as the remaining factors in the plot. Accordingly, the factor analysis was repeated with only 2 factors extracted.

The second factor analysis output revealed that the item from the Protective Factors Questionnaire was loaded similarly on both factors, therefore a third factor analysis was conducted excluding that item. The third factor analysis categorised the remaining 9 items from FILE and SIPA, which explained 45.48% of the variance. In each component, the factor loadings were all higher than .4, with .422 as the lowest. The factor loadings for these are presented in Table 3.9, with loadings less than .3 suppressed. Individuals' scores on these two factors were saved as Factor 1 and Factor 2 for the next part of the analysis.

Table 3.9

Factor loadings with varimax rotation for 9 items from FILE and SIPA relating to negative experiences

Items	Factor 1	Factor 2
FILE18	.69	
FILE19	.42	
FILE5	.58	
SIPA60	.78	
SIPA68	.68	
FILE6		.58
SIPA5		.62
SIPA40		.67
SIPA89		.80

Thus, 9 of the set of 10 original items potentially contributing to negative experiences seemed to fall into two categories.

2) Paths from negative life experiences to offending

The path from Negative Experiences to Anger was investigated by entering Factor 1 and Factor 2 scores into linear regression model as predictors, and NAS-PI anger measure as the criterion variable. Table 3.10 presents the linear regression output.

Table 3.10

Negative experiences factors predicting NAS-PI anger scores

Predictor variable	<i>B</i>	Standard error of <i>B</i>	<i>t</i>
Factor 1	.09	.08	1.22
Factor 2	.17	.08	2.21*
Constant	.00	.08	.03

* $p < .05$

Factor 2 was a significant predictor of NAS-PI anger scores. However these overall model was barely significant ($F = 3.19, p = .045$). The next step in the model suggests that anger would lead to aggression, which we tested by entering NAS-PI anger scores as predictor variable and CBCL aggression scores as criterion variable. Table 3.11 lists the output for this model.

Table 3.11
 NAS-PI anger scores predicting CBCL aggression scores

Predictor variable	<i>B</i>	Standard error of <i>B</i>	<i>t</i>
NAS-PI	.45	.09	4.93***
Constant	-.005	.08	-.07

*** $p < .001$

From Table 3.11, it is apparent that anger predicts aggression. The first order correlations in Section 2 confirm relationships between anger and aggression, and between aggression and offending (the remainder of the path). However, it is evident that this model is not particularly robust because of the weak link between Factor 1 and 2 scores and anger, and a simplified model (omitting anger) was tested next. In this model, both factor scores were entered in a single step linear regression as predictors, and CBCL aggression score as criterion variable. Table 3.12 presents the output for negative experiences predicting aggression.

Table 3.12
 Negative experiences factors predicting CBCL aggression scores

Predictor variable	<i>B</i>	Standard error of <i>B</i>	<i>t</i>
Factor 1	-.11	.08	-1.41
Factor 2	.44	.08	5.59***
Constant	-.004	.08	-.06

*** $p < .001$

Factor 2 was a significant predictor of aggression (as it was also for anger in Table 10). Negative experiences did better at predicting aggression than predicting anger, with $F = 16.64$, $p = .00$ for the model. The path viable for mediation is illustrated in Figure 3.2. Standardised coefficients in Figure 3.2 were calculated from unstandardised coefficients from later regression analyses in Table 3.13 and 3.14.

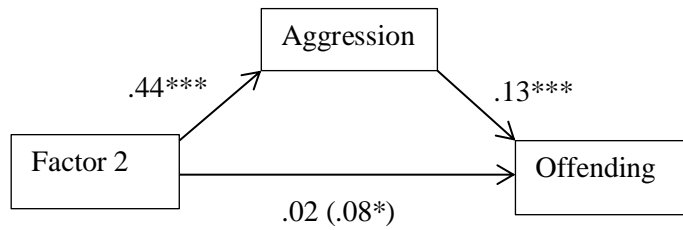


Figure 3.2. Standardised regression coefficients for relationship between Factor 2 and offending mediated by aggression. The standardized coefficient between Factor 2 and offending controlling for aggression is in parentheses. Marked coefficients are significant at *** $p < .001$.

Regression analyses were computed to see whether Factor 2 lessens its strength in predicting offending when aggression was added as a mediator. To illustrate this, a hierarchical logistic regression was performed with offending as the criterion variable. Factor 2 was entered as a predictor in the first step, followed by aggression in the second step. These regression outputs are listed in Table 3.13 and Table 3.14.

Table 3.13
Factor 2 of negative life experiences predicting offending

Predictor variable	<i>B</i>	Standard error of <i>B</i>	Wald	Exp(<i>B</i>)
Factor 2	.39	.2	3.78	1.47*
Constant	-1.03	.21	24.8	.36***

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

Table 3.14
Factor 2 of negative life experiences and aggression predicting offending

Predictor variable	<i>B</i>	Standard error of <i>B</i>	Wald	Exp(<i>B</i>)
Factor 2	.12	.23	.27	1.13
Aggression	.62	.23	7.12	1.87**
Constant	-1.06	.22	24.68	.35***

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

From Table 3.13 and Table 3.14, Factor 2 was a significant predictor for offending in the first step. However its significance as a predictor dropped to statistically insignificant in step 2 when aggression was added, suggesting that aggression is a mediator between Factor 2

and offending. The Sobel test was carried out for the path of Factor 2 to offending via aggression as a mediator. The test revealed that paths from Factor 2 to offending via aggression was significantly greater than zero, $Z = 2.406, p < .05$. Both the regression analyses and the Sobel test reported that there is a significant mediation path from Factor 2 via aggression to offending. This means that the path from Factor 2 to offending dropped from statistically significant to non significant when aggression was added as a mediator.

3.3.2 Self-control theory

The path for self-control theory is illustrated in Figure 3.3.

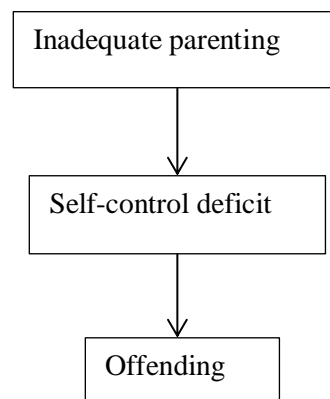


Figure 3.3. Self-control theory model path

Self-control theory suggests that a number of negative parenting/discipline variables would contribute to insufficient development of self-control, which in turn could lead to offending. Thus, in the theory, self-control deficit lies between inadequate parenting and offending.

1) Factor analysis for parenting variables

There are five potentially relevant parenting variables from the APQ (parental involvement, positive parenting, poor parental monitoring, inconsistent discipline, and corporal punishment) indicating inadequate parenting. These were entered in factor analysis

varimax rotation with Kaiser normalisation method. The scree plot indicated that there were two factors.

The rotated component matrix revealed two components with eigenvalue greater than 1. However, corporal punishment was loaded on both components, therefore this variable was excluded and the second factor analysis was computed. The factor loadings for the remaining four variables are presented in Table 3.15. The factor loading scores were saved as new variables for the next part of the analysis. The following tables are presented with smaller than .4 values suppressed.

Table 3.15
Factor loadings with varimax rotation for 4 items from APQ

Items	Factor 1	Factor 2
Positive parenting	.9	
Parental involvement	.9	
Poor parental monitoring		.85
Inconsistent discipline		.86

Self-control deficit is comprised of 4 variables. These are perspective taking, empathic concern, impulsivity scores from APSD, and impulsivity scores from Conners rating scale. These 4 variables were entered in the factor analysis with the same method. These variables were categorised into two components, separating them into self centred traits and impulsivity as presented in Table 3.16. Factor loading scores were saved as new variables for the next part of the analysis.

Table 3.16
Factor loadings with varimax rotation for 4 items included in self-control deficit

Items	Factor 1	Factor 2
Perspective taking		.88
Empathic concern		.89
APSD impulsivity	.93	
Conners impulsivity	.93	

2) Paths from parenting to offending

Bivariate correlations were calculated in order to see whether either component of self-control deficit was significantly correlated with offending. Only Factor 1 (impulsivity) of self-control deficit factor was significantly correlated with offending ($r = .28, p < .01$). The next step was to examine whether parenting factors predict impulsivity. Impulsivity was entered in a single step multiple regression as the criterion variable and both Factor 1 and Factor 2 (parenting factors) as predictors. The output is given in Table 3.17.

Table 3.17
Parenting factors predicting impulsivity

Predictor variable	<i>B</i>	Standard error of <i>B</i>	<i>t</i>
Factor 1	-.07	.09	-.08
Factor 2	.284	.09	3.11**
Constant	.01	.09	.15

** $p < .01$

From Table 3.17, Factor 2 of parenting was a significant predictor to impulsivity, while Factor 1 was not. At this step there is one possible path for mediation as illustrated in Figure 3.4. Standardised coefficients in Figure 3.4 were calculated from unstandardised coefficients from later regression analyses in Table 3.18 and 3.19.

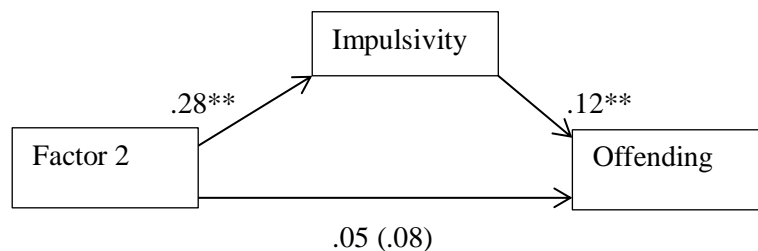


Figure 3.4. Standardised regression coefficients for relationship between Factor 2 and offending mediated by impulsivity. The standardized coefficient between Factor 2 and offending controlling for impulsivity is in parentheses. Marked coefficients are significant at ** $p < .01$.

Regression analyses were computed to see whether Factor 2 lessens its strength in predicting offending when impulsivity was added as a predictor. To illustrate this, a hierarchical logistic regression was performed with offending as the criterion variable. Factor 2 was entered as a predictor in the first step, followed by impulsivity in the second step. These regression outputs are listed in Table 3.18 and Table 3.19.

Table 3.18
Factor 2 of parenting factors predicting offending

Predictor variable	<i>B</i>	Standard error of <i>B</i>	Wald	Exp(<i>B</i>)
Factor 2	.38	.21	3.27	1.46
Constant	-1.02	.21	23.04	.36

Table 3.19
Factor 2 of parenting factors and impulsivity predicting offending

Predictor variable	<i>B</i>	Standard error of <i>B</i>	Wald	Exp(<i>B</i>)
Factor 2	.23	.22	1.13	1.26
Impulsivity	.55	.22	6.54	1.73
Constant	-1.1	.22	23.49	.34***

*** $p < .001$

From Table 3.18 and Table 3.19, Factor 2 predicted offending better than when impulsivity was added in step 2. The contribution from parental monitoring became much weaker, also in these steps Factor 2 did not act as a significant predictor for offending. The Sobel test also revealed that the path from Factor 2 to offending via impulsivity is significantly greater than zero, $Z = 1.976$, $p < .05$. This means that strength of the path from Factor 2 of family factors to offending dropped when impulsivity was added as a mediator. Note that the Sobel test is statistically significant, which seem to indicate that impulsivity is a mediator between Factor 2 and offending, however impulsivity was not a statistically significant predictor to offending as shown in Table 3.18. Therefore the strength of impulsivity as a mediator should be carefully interpreted.

3.4 Structural equation modelling

To confirm the results above, apparently viable models for both theories were constructed using the same set of variables in the previous section and the paths were tested using structural equations.

3.4.1 General Strain Theory

Items that were included in the negative life experience variable (1 item from FILE (F6) and 3 items from SIPA (S5, S40, S89), aggression, and offending were built into a structural equation as presented in Figure 3.5.

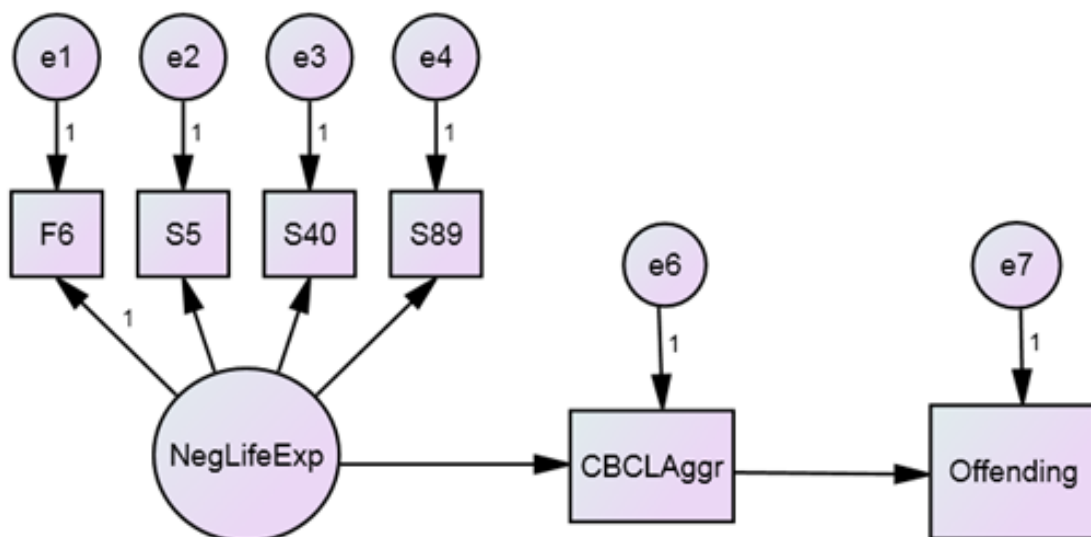


Figure 3.5. Structural equation model for general strain theory.

As previously revealed with the Sobel test that the path from negative life experiences via aggression to offending is significant, this is also present in the model. The chi square value is not significant ($\chi^2 (9) = 7.67, p = .57$) which indicated that there is no significant discrepancy between model and data. Furthermore, the fit indices of CFI (1) and NNFI (1) and RMSEA of 0 indicated that the model is a good fit to the data.

Structural equation modelling assesses both direct and indirect effects of variables in the model on likelihood of offending. The following two direct effects were confirmed: 1) Negative life experiences was significantly ($\beta = .563, p < .001$) related to aggression, 2) Aggression was significantly ($\beta = .313, p < .001$) related to offending. Test of indirect effects was carried out by bootstrapping based on 1000 iterations with Monte Carlo parametric sampling method ($N = 1000$). The indirect effect of negative experiences on likelihood of offending was significant ($p = .001$) indicating that path from negative life experience to offending via aggression was significant.

3.4.2 Self-control theory

Parenting factors (parental monitoring and inconsistent discipline), impulsivity (ASPD impulsivity score and Connors impulsivity score), and offending were built into a structural equation model. The model is illustrated in Figure 3.6.

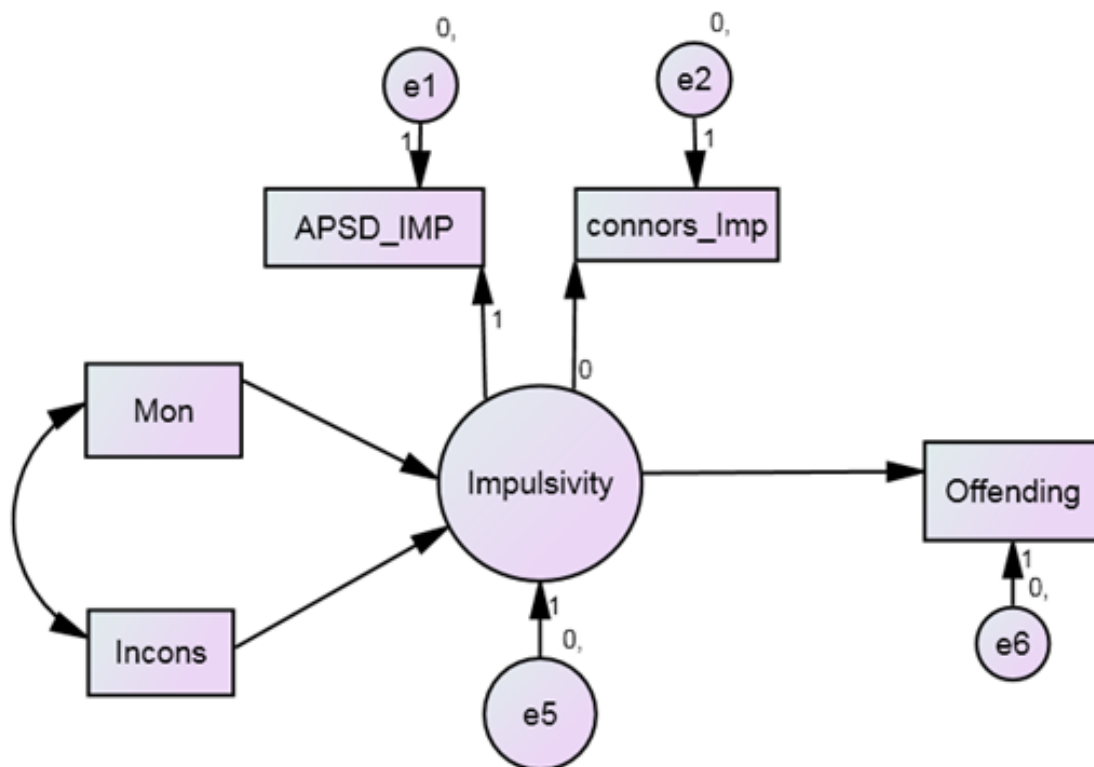


Figure 3.6. Structural equation model for self-control theory.

As presented in Figure 3.6, poor parental monitoring and inconsistent discipline are directly related to each other. The model is tested on both parenting factors paths via impulsivity to offending. The chi square value is not significant ($\chi^2(4) = 1.78, p = .78$) which indicated that there is no significant discrepancy between model and data. The fit indices of CFI (1) and NNFI (1) and RMSEA of 0 indicated that the model is a good fit to the data.

The path from poor parental monitoring to impulsivity was not significant ($\beta = .071, p = .5$). However the path from inconsistent discipline to impulsivity was statistically significant ($\beta = .241, p = .023$). The path from impulsivity to offending was significant ($\beta = .32, p = .002$). This leaves only one path from inconsistent discipline via aggression to offending to be further tested.

Bootstrapping based on 1000 iterations with Monte Carlo parametric sampling method was performed ($N = 1000$) for indirect effects. The indirect effect of inconsistent discipline on likelihood of offending was significant ($p = .025$), indicating the path from inconsistent discipline to offending via impulsivity was significant.

3.5 Logistic regression model

This study is a follow-up from McLoughlin et al (2010) and Panckhurst (2010) which focused on the ability of CU traits and aggression in combination to predict antisocial behaviours. The focus of this study was to expand on this earlier work by examining the predictiveness of family factors in addition to CU traits and aggression.

Logistic regression was chosen for the following reasons; 1) it serves well as a suitable method that fits with one of the objectives of this study, which was to expand on earlier work by examining whether family factors are predictive of antisocial behaviours in addition to CU traits and aggression. And 2) regression analyses controls for more factors which allows the researcher to see each factor's contribution to the model. Logistic regression easily allows variables of interest to be entered at the same time. The model output would then reveal variables of interest's contributions to the model, and the contributions can also be easily compared. It allows us to see whether variables are related to, or are better or worse predictors of the criterion variables than others.

A total of 7 participants were removed at this stage, due to insufficient data (only CU trait data were available for these individuals). As can be seen from Table 3.2, there was a significant amount of missing data for the remaining 119 cases. Using multiple regression, the pattern of missing data was determined to be random, in that it could not be predicted which individuals were likely to have incomplete data. On that basis, missing data were replaced using data imputation (in STATISTICA). Next, normality was checked by examining skewness statistics for all variables to be used in the analysis. Logistic regression is less sensitive to skewness than regular multiple regression, but one variable (shared deviant beliefs) was found to be highly skewed (skewness statistic = -3.536). Accordingly, this variable was recoded according to a 3-point scale, and this reduced the skewness statistic to -.552.

The following logistic regression was done twice, once with shared deviant beliefs as originally scored and once with it recoded. The output for the regression indicated that the skewness of the variable only very mildly affected the results of the regression. The significant variables were the same in both analyses. Coefficients and significance levels were virtually unaffected. Since skewed shared deviant beliefs did not affect the analysis, the regression output reported in this section is the one with the original scoring of shared deviant beliefs.

The final prediction model includes all the family variables introduced in Section 1. In order to test whether CU traits and aggression were reliable predictors for offending, these two predictors were entered at step 1, with offending as the criterion variable. The output of CU traits and aggression predicting offending is presented in Table 3.20.

Table 3.20
Logistic regression output for CU traits and aggression predicting offending

Effect	<i>B</i>	Standard error of <i>B</i>	Wald	Exp(B)
CU traits	-.01	.02	.27	.99
Aggression	.08	.03	6.90	1.08**
Constant	-5.13	1.37	14.08	.01***

** $p < .01$

*** $p < .001$

From Table 3.20, aggression was a significant predictor of offending. However, CU traits was not significant. This step of the model's -2 log likelihood is 126.892. This value will be used in order to see whether and if there is a significant increase after family factors are added into the model in the next step. The remaining family variables were entered in the second step, and the results are presented in Table 3.21.

Table 3.21
 Logistic regression output for CU traits, aggression, and family variables predicting offending

Effect	<i>B</i>	Standard error of <i>B</i>	Wald	Exp(<i>B</i>)
CU traits	-.00	.03	.01	1.00
Aggression	.09	.04	4.41	1.09*
Parental involvement	-.15	.08	3.86	.86*
Positive parenting	.17	.12	2.06	1.19
Poor par. monitoring	.06	.07	.59	1.06
Inconsistent discipline	.06	.09	.51	1.06
Corporal punishment	-.28	.21	1.77	.76
Beliefs in the family	.84	.86	.94	2.30
Cohesion	-1.08	.94	1.31	.34
Shared deviant beliefs	3.04	1.30	5.48	20.85*
Support	-.08	1.06	.01	.92
Organisation	1.40	1.09	1.65	4.05
Communication	-.03	.68	.00	.97
FILE total score	.01	.00	7.28	1.01**
Neg adol-par relations	-.05	.03	2.71	.95
Total parenting stress	.03	.02	1.93	1.03
Life Stressors	-.02	.02	1.30	.98
Constant	-19.93	8.11	6.04	.00**

* $p < .05$

** $p < .01$

Table 3.21 presents the logistic regression output with all the variables entered. Variables that remained significant are aggression, parental involvement, shared deviant beliefs, and FILE total score. The -2 log likelihood for this step of the model is 92.644. The difference between the first step of the model and the second step of the model is ($\chi^2(15) = 34.248, p = .003$). The significance indicated that family factors added significantly to the model's prediction.

4. Discussion

This research was an extension of a previous study showing that youth offending could be predicted based on information about callous-unemotional and aggressive traits. It assessed whether prediction of youth offending could be improved by adding information about family and parenting factors. Police records were obtained in July 2012, when the 126 youths in the study were aged 15-17 years, and were used to determine the offending rates. Parents' responses to several questionnaires, collected in 2007 and 2010, were used as predictors.

The study sample was recruited from low socioeconomic status neighbourhoods, a factor which has often been identified as criminogenic. In general, this study should then present scores that are representative of youths who are at greater risk than the general population. Accordingly, scores on several measures were anticipated to be higher on negative factors than the norm.

When the scores were compared to the norms available from other studies respective of the questionnaires, very few factors were substantially different from the norm. Poor parental monitoring and corporal punishment scores were significantly higher than the norm (17.08% and 30.07%, respectively). The difference in percentage for corporal punishment is of concern, considering that the other parenting measures of parental involvement, positive parenting, and inconsistent discipline were within the "normal range". It is of concern because if these figures are truly representative of the family situations, it may mean that these youths were receiving inconsistent corporal punishment, possibly for reasons unrelated to purposes of discipline.

FILE total score, which measures life stressors reported by parents, fell in the moderate range on average. On average, scores on beliefs about family were lower than the norm. This may be indicative of loose family relationships, as the items in this subscale

signify beliefs about how much the family should stick together. Shared deviant beliefs were higher than the norm.

In the following sections the results will be discussed according to particular interests in this study. First, offending statistics will be discussed, then family factors in relation to youth offending which was the focus of this study. Theories of particular interest which suggest a role for family and parenting factors including General Strain Theory, Self-Control Theory, and Moffitt's Life-Course-Persistent trajectory will follow. CU traits and aggression which were the significant predictors found in previous studies will then be discussed. The results of logistic regression model predicting offending using CU traits, aggression, and family factors and possible underlying factors will be discussed last.

4.1 Offending

In general, males are often found to be at higher risk of offending than females (Cassidy, 2011). Males are also more likely than girls to externalise their behaviours (Vandervalk et al, 2004), and this may contribute to the usual higher prevalence of males offenders than females offenders. In our study, this was not the case. There was a noticeably higher percentage of female youths who have offended (although it was not statistically significant) than male youths who have offended.

The prevalence of youths who have offended in this study was also higher than general population. The ministry of justice reported apprehension rates of 15.62% (1,562 apprehensions per 10,000 population in youths aged 14-16 years). In our study, 27% (34 out of 126) have offended. Some of the reasons might be that the initial recruitment of participants was sought in low socioeconomic status neighbourhoods, which is one of the characteristics and risks found in offenders.

4.2 Family factors

The parents' responses were obtained in 2007, five years prior the retrieval of the police record for this study in 2012. Youths in the study were in pre-adolescence at the time of response collection, thus there is a five year gap in which level of parental involvement was not recorded. It is unfortunate that parental responses were not obtained in the interim period and this shall be an important issue to be raised in future similar studies. Regardless, the early responses indicated that some of the youths' families were showing early signs of less than optimal level of parental involvement, and it is likely to contribute to the risk of juvenile delinquency.

Previous research has identified a number of personal and family factors that are associated with offending including parental monitoring, parental discipline, social achievement, difficult temperament, antisocial attitudes, and antisocial peers (Andrews & Bonta, 2003). The majority of these factors were included in this study, although the primary focus is on family factors which were found to be associated with offending.

In the present study, offending was found to be correlated with some family factors, but not with parenting factors. Specifically, it was negatively correlated with family cohesion and communication, and positively correlated with family stress (FILE total score). Offending was also positively correlated with shared deviant beliefs, but the relationship only approached statistical significance. These correlations may be indicating that families of delinquent youths are likely to be lower on cohesion and communication, and also were exposed to higher number of stressors than families of non delinquent youths. Parents of delinquent youths were also quite likely to share deviant beliefs and may be more accepting of some delinquent acts.

Surprisingly none of the parenting measures was significantly correlated with offending, unlike previous studies which have often found that parenting factors were

strongly associated with offending (e.g. Farrington, 2011; Hoeve et al, 2008). There were indications that low parental involvement, poor parental monitoring, and inconsistent discipline are likely to be related to offending, however the correlations between these parenting variables and offending were not statistically significant.

4.2.1 Parenting factors

The noticeable pattern in the results is that positive parenting practices tend to occur with other positive parenting factors, and that negative parenting practices were found to occur with other negative practices. These correlations suggest that when parents are not able to monitor their child on an appropriate level, it is likely to lead to inconsistency of disciplining the child. Corporal punishment is also more likely to occur in this study. On the other hand, in families with higher level of parental involvement, there is a good chance that positive parenting methods are also being applied.

Inconsistent discipline and corporal punishment are the two negative parenting measures which were significantly correlated with other variables included in the study. Both of these were correlated with negative relationships between adolescent and parent, total stressors, and family support, and organisation. The idea of effective methods of parenting and properly maintained relationships within the family as a protective factor of delinquency was demonstrated in several studies (e.g. Henry et al, 2001; Johnson et al, 2011)

Weaker parenting practices seem to emerge alongside weaker relationships and cohesion in the family, whereas parental involvement was found to be positively correlated with family cohesion, and negatively correlated with total stressors and negative adolescent-parent relationship. These translate to the same conclusion that positive parenting practices are likely to directly affect the relationships and stress in the family.

4.2.2 Relationships in the family

Much like parenting factors, family relationships tend to correlate in the same pattern. Positive attributes of relationships tend to be positively correlated with other positive factors, and negatively correlated with negative factors. Cohesion was positively correlated with positive parenting, support, communication, and was negatively correlated with beliefs, total stressors, and negative adolescent-parent relationship. While these pairs may be expected, the negative correlation between beliefs about family and cohesion was not anticipated. Beliefs about family was also negatively correlated with communication, and positively correlated with poor parental monitoring, FILE total stressors score and SIPA life stressors score. However, examination of the items in this subscale suggests that it may be a rather confusing one. According to the scoring method, the beliefs about family subscale is supposed to be a negative scale. The items would indicate that the respondent has beliefs that family should stick together, and children should obey and concur with parents without having to be told. While most of the items seem to indicate authoritarian parenting, others were not likely to be negative attributes in all of the situations (e.g family togetherness is clearly positive).

Shared deviant beliefs was negatively correlated with inconsistent discipline and SIPA total stressors. It was positively correlated with support and organisation. These correlations indicated that parents with deviant beliefs are likely to be applying inconsistent discipline and exposed to stressors, but also rate their families as being strongly supportive and organised. One out of 4 items from shared deviant beliefs is “it’s OK to fight if other guy says bad things about you or your family” while other questions indicate dishonesty and unnecessary deviant activities (it’s OK to lie to someone if it will keep you out of trouble with them, it’s OK to steal something from someone who is rich and can easily replace it, it’s OK to skip school every once in a while). The item which states the agreement on defending themselves may be a contributing factor to the correlations between shared deviant beliefs

and positive aspects of the family. A likely scenario from the significance appearance of shared deviant beliefs and positive family togetherness factors is that some families are indeed supportive of their family members. However, they may be supportive of each other on deviant actions and may be hostile towards people outside of their family. This pattern of behaviour would manifest itself to be rather antisocial, which renders the positive attributes of support and cohesion found within these families to be on a criminogenic side.

Negative relationships between youth and the parent was positively correlated with the majority of negative factors, and also CU traits and aggression. This could be indicative that relationship between child and parent is more important and prone to be influenced by other aspects in the family, and this is supportive of Agnew's (1992) GST. Agnew has stated that poor relationships between youth and parents was one of the factors related to delinquency. It is positively correlated with poor parental monitoring, inconsistent discipline, beliefs about family, and total stressors.

It is unclear whether negative relationships are the outcome of inadequate parenting, or that inadequate parenting occurred as a result of being unable to control the child due to strained relationship. Either way, its significance correlation to CU traits and aggression stresses how important the relationship between the child and the parent really is.

4.2.3 Stress in the family

Two stressor variables were included in this study, which were total stressors scores from FILE and SIPA. SIPA stressors score was correlated with offending, CU traits, and aggression. It was also significantly correlated with the majority of the family variables. Thus stress in the family is either impacting on, or occurring as a result of the negative practices in the family. SIPA stress was highly correlated with FILE score, and in the logistic regression model only FILE score remained a significant predictor for offending.

Stress reported in FILE was significantly correlated with a number of parenting and relationships factors. It was not as significantly correlated with as many other family variables as the SIPA measure, but it was related to corporal punishment and offending. It also appears that low support, low organisation, and low communication were related to higher levels of stress.

Main findings from previous research (e.g. Juby & Farrington, 2001; Haas et al 2004; Krohn et al, 2009) emphasised on the possible impact of event/stress in the family on youth's emotional development and attachment. However, they are mostly caused by disruptions in the family such as divorce, separation, or loss of a family member. SIPA and FILE scores used in this current study are not suitable measure of these particular events. Subscales in FILE appear directly relevant but the authors recommend against using them individually, and SIPA subscales are too general. Regardless, it is apparent that stress in the family is likely to be related to offending and it seems possible that stress contributes directly to the use of corporal punishment.

4.3 Theories

Several major theories were investigated using variables specifically created for theory testing. Screening models with mediation analyses, and confirming using structural equation modelling, partial support was found for Agnew's general strain theory and Gottfredson & Hirschi's self-control theory. There was little apparent support for Moffitt's life-course-persistent trajectory.

4.3.1 Agnew's General Strain Theory

General strain theory proposed that an accumulation of negative experiences would be strains, which then drive youths to feel anger. Anger is a trigger to aggression, which then turns to offending. Thus a series of negative experiences is the cause, and anger/aggression is the mediator to offending.

GST was tested by combining various questions from measures already available in the study. Support was found for a path from some negative experiences to offending via aggression. Items of negative experiences that were included in the significant path were: 1) increase in arguments between parent(s) and child, 2) my child shows affection towards me (reversed score), 3) my child likes to do things with the whole family (reversed score), and 4) I cannot get my child to listen to me. These items were all indicative of negative relationships between parent and child. As mentioned in the previous sections, relationships between parent and child were significantly correlated with other negative aspects, and correlated with less of the positive traits in the family. However, not all of the potentially relevant items proved useful in the context of this theory. Parental conflict and negative life event failed to show significant relations to aggression, but negative relationships emerged as a strong factor to aggression.

These findings are supportive of Asetine et al's (2000) study which found that family conflict was associated with anger, however in the study the youths were put at a higher risk with association with delinquent peers. Even though in the current study, negative experiences factor was related to anger as a significant predictor, it was rather weak. In other studies investigating GST, peer delinquency played a big role on the contribution to youth delinquency. However in this study the items indicative of peer delinquency were not significantly related to youth offending.

4.3.2 Gottfredson & Hirschi's Self-Control Theory

The self-control theory, as the successor of Hirschi's control theory, emphasised on the importance of parenting practices and their impact on delinquency. The key precursor to offending in this theory is a deficit in self-control. Inadequate parenting practices may result in little development of youth's capacity for self-control, and this leads to offending. Individuals with a deficit in self-control are impulsive, are risk-seekers, and are self-centred.

In this study, the self-control theory was evaluated by testing the path from parenting to offending via self-control. In this case, measures that were used as indicators of self-control deficit included weak perspective taking, low empathic concern, and impulsivity measures from ASPD and Conners rating scale. The results gave some support for the path proposed in the theory.

The parenting discipline factors that were significant in this path were poor parental monitoring and inconsistent discipline. These are the two parenting practices that were significantly correlated with many other variables included in this study. This suggests that inconsistent discipline and poor parental monitoring are both important parenting factors which likely have a large impact on youths' development and relationships in the family.

Surprisingly, other parenting factors that indicate positive parenting were not related to self-control deficit at all and hence had to part in the model.

Results from this study only partially supported self-control theory as self-centredness (weak empathy and weak perspective taking) was not found to be a significant factor in offending. However, the relationship between poor parental monitoring and inconsistent discipline and offending via impulsivity represents considerable support for the theory.

4.3.3 Moffitt's Life-Course-Persistent Trajectory

Moffitt's (1993) review paper is famous for introducing the idea that there are marked differences between offenders who commence offending early and continue to offend throughout their lives (LCP) and offenders which offend only during their teen years (adolescence-limited or AL). Some of the differences include neurological deficits and behavioural problems such as conduct disorder and ADHD (Moffitt, 1993). It was also often found that in the lives of LCP offenders, they were likely to have experienced problems with their family relationships (Yessine & Bonta, 2009).

The earliest indicator that an individual is on the LCP trajectory is early evidence of offending. In the present study, where offending was measured in the mid teenage years, those who have offended have done so early in life, and might be expected to show the pattern described for LCP offenders. The model was tested using, 1) deficit in attention/concentration, 2) negative relationships with adults, and 3) corporal punishment in relation to offending. However, there was no significant correlation between the factors at all. This was rather surprising, but it should be noted that there were limited measures on neurological deficit available in this study, and thus a fundamental feature of the trajectory was not well measured.

4.4 Callous-Unemotional traits

Earlier studies based on this sample have identified CU and aggressive traits as likely predictors of delinquency, in that both were associated with known risk factors for offending (McLoughlin et al, 2010) and with school disciplinary problems (Panckhurst, 2010). The present study confirmed that CU traits were found to be correlated with a large number of family variables, especially parenting factors. This suggests that parenting discipline may be contributing greatly to development of behaviours. It would then also be possible that if the youths were raised with adequate parenting and discipline, they may have developed lower CU traits. Regarding family relationships, CU traits were also found to be correlated with various factors which indicated looser or weaker family relationships. Youths with high CU traits were found likely to have families with lower levels of cohesion, support, organisation, and communication as reported by parents. Having high CU traits were also found to be correlated with negative relationships between youth and parents/caregivers. From the correlations, there is no clear indication of whether CU traits were a cause or effect of inadequate parenting.

The results from this study expand the links to and from CU traits. It has often been found that CU traits and antisocial behaviours are associated (e.g Frick et al, 2005; Frick & White, 2008; Frick, 2012), but its association with various family factors has not been investigated. The correlations in this study may provide important indications of how CU traits may be managed if they were indeed related to family factors. One speculation is that CU traits may not be the starting cause of offending per se, but rather, are themselves the outcome of parenting practices. CU traits were found to be negatively correlated with positive parenting, and were positively correlated with poor parental monitoring and inconsistent discipline. It is a likely scenario from these pairs of correlations that youths with CU traits received less than adequate level of parenting practices. An alternative speculation from this

finding may be that youths with CU traits exhibit behaviours that are more difficult than youths with no behavioural problems for parents to handle. This would affect parents' ability to give the youths with CU traits proper discipline.

The association between CU traits and offending in this study is not as strong as expected. Although CU traits were correlated with offending, this relationship reduced to non-significance when aggressive traits were controlled for in the logistic regression model. In any case, it should not be dismissed that there are strong links between CU traits and family factors, and that it showed significant correlation with offending.

4.5 Aggression

Aggression was more strongly correlated with offending than CU traits were. It had one of the strongest associations with offending, and also remained a significant predictor of offending in the final model. Furthermore, it was found to be a mediator between some of the negative life experiences factor and offending. Similar to CU traits, aggression was found to be associated with many family factors. Notable significant parenting variables that were found to be associated with aggression include poor parental monitoring and inconsistent discipline. Aggression was negatively associated with organisation and communication. It is also positively associated with negative relationships between youth and parents, and also total stressors score from SIPA.

As in the case with CU traits, above, it is difficult to determine whether aggression is a cause or a consequence of these related factors. When aggression is viewed as a consequence, there is much to say about what may have caused the child to act aggressively. Starting from inadequate parenting, low parental monitoring may allow the child to be aggressive if this behaviour is not being corrected by parents. Inconsistent discipline may be

a consequence of poor monitoring. The child might be punished for their behaviour, but not consistently as they were not monitored appropriately.

On the other hand, it has been argued that aggression is a personality trait that is developed in early in life-course-persistent offenders (Moffitt, 1993). Moffitt (1993) stated that in life-course-persistent offenders most likely possess neuropsychological deficits, and these deficits affect and play a large role in developing youths' negative behaviours. Some of the behaviours including inattention, impulsive, and overactive are likely to have parents find them challenging to discipline.

If aggression was viewed as a cause that parents find youths with higher levels of aggression more difficult to handle and discipline, it may explain the negative relationships with parents and total stressors reported in this study. Aggression can be causing negative relationships and applies stress, and this may be the reason why aggression in youths was found with poor parental monitoring and inconsistent discipline. The result of negative relationships with parents would also lead to stressors which stem from the chain of possible conflicts.

4.6 Predicting offending: Regression model

The logistic regression model was conducted in order to test and expand the predictability of CU traits, aggression, and whether family factors would add to the predictiveness of offending. With logistic regression, the purpose was to examine the strength and predictiveness of each variable to offending. Some variables in the previous section of structural equation modelling failed to make their appearance as significant predictors in the regression model in this section. However the models in the previous section were specifically shaped and tested based on each theory's claims. In this section, the factors were overall tested for their predictiveness of offending. Furthermore, in a logistic regression

analyses, variables were controlled for on various factors, which means that each variable were not assumed to be related to each other. Therefore variables that were significant in the previous section of structural equation modelling may no longer appear as a significant predictor in the regression model once other relations and factors which could influence each variables were controlled for.

4.6.1 CU traits and aggression

In McLoughlin et al's (2010) study, children with high CU and high aggressive tendencies were found to possess more behavioural and social problems. Results from the present study, based on the same study population, extend those earlier results by finding that both CU traits and aggression were found to be significantly correlated with offending. The association of CU traits and offending is consistent with a number of previous studies on CU traits and their association with antisocial behaviours (e.g. Essau et al, 2006; Frick et al, 2005).

However, CU traits and aggression were highly inter-correlated, and when both were entered in a logistic regression as predictors to offending, aggression dominated over CU traits, which became nonsignificant. A similar pattern was also found by Panckhurst (2010), using the same study sample, in predicting school disruptive behaviours. It may be that youths in this study do not possess sufficiently high levels of CU traits, resulting in less contribution towards antisocial behaviours as anticipated.

Depending on whether aggression can be assumed to be a cause of other problems or a consequence of poor family environment, the significance of aggression in the regression model may indicate a role for constitutional factors in offending. Aggression was found to be highly due to inheritance and shared genetically by monozygotic twins, but delinquent behaviours were found to be influenced by both genetics and shared environment (Edelbrock

et al, 1995). Several authors (e.g. O'Connor et al, 1998; Moffitt & Caspi, 2001; Yessine & Bonta, 2009) found that LCP offenders were markedly different from AL offenders by their past and likelihood of possessing neurological problems. They were also more likely to receive negative methods of parenting and experience a disruptive home environment as a result. From these studies, LCP offenders may be more prone to development of aggressive behaviours. However, delinquency was said to be contributed by both environmental factors and genetic factors, but not either one alone.

4.6.2 Family factors

Family related variables that remained significant among all of the variables entered in the logistic regression model were parental involvement, shared deviant beliefs, and FILE total score. Several studies (e.g. Farrington, 2011; Hoeve et al, 2008; Ingram et al, 2007) suggested that parenting factors particularly those relating to supervision were strong predictors of juvenile offending. In the present model, low parental involvement was found to be a significant predictor of offending, which is consistent with earlier studies that suggested inadequate parenting and discipline contribute to youth offending. The present results did not support previous authors' findings on parental supervision, however. While poor monitoring and inconsistent discipline were significant in the GST's structural equation model tested, these variables were not significant predictors of offending when entered in the logistic regression model.

FILE total score's significance in the model suggests that parents of delinquent youths were also experiencing a number of life stressors. The inventory includes subscale which measure disruptions in the family, in which disruptions were found to be associated with juvenile delinquency (Juby & Farrington, 2001; Haas et al, 2004; Krohn et al, 2009; Pagani et al, 1998; Cooper et al, 2009). However in this study, only the total score was used because of

the original authors of the inventory raised doubt about individual subscales. Therefore while FILE has disruptions in the family as one of its subscale, it is difficult to pinpoint what stressors were affecting the parents in this study. Nevertheless, the predictiveness of the total score supports a role for family circumstances in the development of offending in youth. Such a role is consistent with the general thrust of General Strain Theory, as discussed above.

In this study, the predictiveness of shared deviant beliefs is a new finding. This factor appeared to be associated with many other variables included in this study, and is also to significant predictor of offending. It is speculated above that in families that were found to have shared deviant beliefs, which is a negative subscale, were also found to have cohesion and organisation which are positive subscales. If these families are supportive of crime acts that are performed by members of the family, and also defend them for these troubling acts (hence the co-occurrence of cohesion and organisation), the environment in the family may be a great breeding ground and support for antisocial behaviours. The outcome from this misdirection of support could only strengthen and shape youths into delinquents.

Aggression has been a consistent significant predictor for antisocial behaviours in previous studies (McLoughlin et al, 2010; Panckhurst, 2010), and it remained a significant predictor of offending in the present study. The significance of stress that was found in the model was not specific to the cause, but its appearance may signify that it is impacting youths, directly or indirectly. Stressful events may impact youths as found in Hoffman (2010) study. Alternatively, stressful events may also affect parents, and that may impact their performance and capabilities to give their child proper discipline and prosocial environment. Aside from the appearance of shared deviant beliefs in the logistic regression model, positive factors that were found alongside shared deviant beliefs should receive more attention to them. This is because there may be underlying relationships between them as speculated above. Finding the significant relations of positive factors, in this case, cohesion and

organisation alongside shared deviant beliefs does not necessarily translate to a good outcome.

One of the most frequently debated regarding results in this study is the difficulty of determining which is the cause and effect of delinquency. Moffitt (1993) has mentioned that children with difficult temperament due to birth related neurological deficits are much less likely to be born into supportive family environment. It was found that the children who are prone to development of antisocial behaviours were prevalent in families with a disadvantage or deviance. The possible cause is that sources of neurological deficits may be from the behaviours preceding birth as some of the authors suggested. Additionally, parents and children who are more likely to develop antisocial behaviours tend to resemble and share characteristics of each other, as the traits are also likely to be inheritable. It was found that parents of these children lack the patience and resources to properly discipline their child. Overall, it appears that the starting point for the child is from the parents' capabilities and initial issues of themselves that precede the birth of the child.

4.7 Conclusions

Delinquency is not caused by any single factor, but many factors. Many of the variables studied here were inter-related, and it is difficult to pinpoint the cause and effect. Nevertheless, theories differ in the variables they call upon, and the causal sequences in which they position them. The results from this study indicate that parenting practices, relationships between adolescent and parent, and stressors in the family are likely to be affecting youth's development, and this supports previous works and theories to a certain extent. Lack of positive family factors were found to be related to CU traits and aggression which were found to be significantly related to offending. This pointed to the importance of positive family factors and circumstances are likely to be important grounds for youths to

develop prosocial behaviours and values. The factors that were found to be predictive of offending, which were shared deviant beliefs in the family, level of youth's aggression, and total stressors in the family, could be used as possible indicators to assess risk of offending in youths.

4.8 Limitations and future research

1) Responses collected from youths and parents in this study were not collected at the same time, therefore some were not completed by all of the 126 youths and their families. Ideally, all participants' responses should be completed and obtained at the same time with possible records of when the response collection took place.

Following these procedures would ensure that the data obtained is consistent and that results obtained reflect and applied to the participants. Future studies may benefit from having a higher number of sample size and consistent responses collected from their participants.

2) The lack of follow-up responses during the early teens to the late teens has proven to be a large obstacle to observe parenting practices and associated family factors. A number of factors and discipline methods may have changed during the years, and it would no doubt be much more optimal to have more information on the details or changes and development in the pattern of the family behaviours and stressors.

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