

**Social factors associated with
internalising and externalising
behaviours in Pacific Island children,
at age 11 years**

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behaviours in Pacific Island children,
at age 11 years**

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Attestation of authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signature: _____

Date: _____

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Abstract

Social factors associated with internalising and externalising behaviours in Pacific Island children, at age 11 years

Pacific children experience a disproportionate number of mental health difficulties (Craig, Jackson, Han, & NZCYES Steering Committee, 2007). The World Health Organization (2013) recognizes that 50 percent of all mental health disorders have already begun before the age of 14 and are the main factors underlying disability in adolescence. Internalising and externalising behaviours in children can precede many mental health disorders that have a detrimental effect on other family members and relationships and have the potential to impair a child's development, educational achievement and their ability to lead normal lives (Cicchetti, 1984). Therefore, it is important to examine the factors that influence the development of these problems in children of Pacific Island descent in the pre-adolescent years. It is anticipated that findings from this research project will assist health practitioners to identify and support 'at risk' children.

Study aims

The aims of this study were to (1) identify the distribution of internalising and externalising behaviours in Pacific Island children at 11- years-of-age, (2) isolate the social factors associated with internalising and externalising behaviours at 11- years of age, and (3) explore the relationships between family, childhood and socio-economic factors to determine whether specific combinations of factors potentially have a greater effect on behaviour.

Design and methods

The research project uses anonymous secondary data from the Pacific Islands Families Study (PIFS) which is a longitudinal, multi-disciplined study that follows a birth cohort of 1376 Pacific babies and their families born at Middlemore Hospital in 2000. For this thesis, a cross sectional design is used to examine the associations between children's internalising and externalising behaviour and family circumstances and other variables that have been collected at the 11-year phase (Domholdt, 2005). Data collection utilised a multi-informant approach, including child, parent and teacher participants. Social variables of interest for this thesis are family characteristics (mother's marital status and family stability, mother's education), child characteristics (child gender, ethnicity, cultural alignment, achievement at school, peer relationships exposure to bullying and involvement) and socio economic characteristics (mothers and father's income and household size).

Results

Findings from the study indicated that the majority of children show no or minimal signs of externalising or internalising behaviours. However, larger than expected numbers of children identified as being involved in bullying, feeling marginalised or having family members or friends that were part of a gang.

Analysis showed that there were individual factors that increased the risk of either internalising or externalising behaviours. The study also established that there were specific combinations of factors that had cumulatively greater significance on children's internalising and externalising behaviours. There was increased likelihood of internalising behaviours for children who were female, had good relationships with their parents, difficulties in forming good relationships with other children, did not consider themselves as being good at sport, and had family members who were part of a gang. The study found that an increased likelihood of externalising behaviours was predominantly associated with socio-economic

disadvantage; children with mothers in a less stable relationships, had poor reading ability, were from a low income family, lived in crowded households and had family members who were part of a gang.

Discussion

Findings from this study should be considered in relation to the possible protective factors; conditions or circumstances that provide positive adaptation despite the presence of risk factors. The ability for children to maintain good quality friendships with peers and caregivers, achieve at school and in sport and develop a satisfactory level of performance in sporting activities build self-confidence are seen as having positive prognostic implications and associated with a reduction in the likelihood of internalising behaviours developing. It is suggested that improving family stability and financial circumstances will help to reduce the prevalence of externalising behaviours.

Conclusion

This study has successfully identified the distribution of internalising and externalising behaviours (measured as scores) in Pacific Island children at 11 years, old and isolated the social factors associated with internalising and externalising behaviours. It has also established that specific combinations of family, childhood and socio-economic factors have a greater significance.

Many of the findings in this study are consistent with the literature and should assist health professionals broadly identify at-risk children. The findings from this study also support government policy initiatives that focus on addressing health and social disparities.

Chapter 1 – Introduction

1.1 Background

During the period from 1950 to the 1980 many Pacific people migrated to New Zealand from the islands of Samoa, Tonga, Cook Islands, Niue, Fiji, and the Tokelau's in search of work and to improve their personal circumstances . Since these waves of migration, Pacific people have established themselves as a permanent and significant group in New Zealand society making economic, sporting and cultural contributions to the nation (Sang & Ward, 2006). Data from the 2013 census shows that the Pacific population residing in New Zealand is ethnically heterogeneous group made up of Sāmoan, 49%; Cook Islands Māori; 21%; Tongan, 20%; and Niuean, 8% (Statistics New Zealand, 2013). Most Pacific people (37%) reside in Auckland and the large majority live in the Otago-Papatoetoe Local Board Area (Statistics New Zealand, 2013.)

New Zealand's Pacific population, as well as being ethnically diverse, is youthful and rapidly growing. The Ministry of Pacific Peoples (2017) states that currently a little less than half of the Pacific population is under 20 years old and by 2026 Pacific peoples will make up 10% of the New Zealand's population, this is a notable increase when compared to 7.4% in 2013. However, compared to the wider population social, economic and health outcomes for Pacific Island families are less favourable than other communities within New Zealand society. Economic as well as health disparities between population groups are driven by poor education levels and low level of skills (Ministry of Pacific Peoples, 2017). Pacific people have the largest percentages of adults with no qualifications, the lowest number of degree completions, lower rates of home ownership, lower personal income and the highest rates of unemployment when compared to other population groups in New Zealand (Sorensen, Jensen, Rigamoto, & Pritchard, 2015). The Pacific population is also characterised by higher levels of obesity, diabetes and tooth

extraction than other groups within the population (Ministry of Health, 2013). It was additionally reported that 26% of Pacific children and 31% of Pacific adults had unmet health needs due to cost in the preceding 12 months (Ministry of Health, 2013).

The Pacific Islands Families Study is a longitudinal, multi- disciplined study that follows a birth cohort of 1376 Pacific babies and their families. Professor Janis Patterson from Auckland University of Technology is the founding director, and is responsible for leading a team of Pacific Island and non-Pacific Island research staff. Participants are identified as Pacific Island babies born at Middlemore Hospital between March 15 and December 17, 2000. Paterson et al (2002, p 3) lists the study's three objectives as

- a) 'to provide information on Pacific peoples' health, and the cultural, economic, environmental and psychosocial factors that are associated with child health and development outcomes and family functioning,'
- b) 'to determine how such factors individually and interactively influence positive and negative child, parent and family outcomes over time and'
- c) 'to provide information that will help set quantifiable targets for Pacific peoples' health.'

The outcomes of these objectives are designed to inform government policy development and programme implementation with the aim of supporting the potential of Pacific families and communities within New Zealand society (Paterson et al, 2002).

The study also uses a multi-informant approach acquiring information from a participant and parental interviews, and teacher assessments. Recruitment and retention is a primary strength of the study and this is attributed to the

involvement of the Pacific people in the study's design and development. At six years, 72.7% of the families continued to be involved the interview process. The study has been predominately funded from grants obtained from the Foundation for Research, Science and Technology (FRST) and the Health Research Council of New Zealand (HRC). The latest round of data collection is due to commence in 2017. The above and further information on the Pacific Island Families Study can be obtained from <http://www.aut.ac.nz/study-at-aut/study-areas/health-sciences/research/pacific-islands-families>.

1.2 Outline of the thesis

This Chapter provides an outline of the various Chapters of this thesis.

1.2.1 Literature review

The purpose of the literature review in Chapter two is to provide a background to the topic of investigation in this thesis: Social factors associated with internalising and externalising behaviours in Pacific Island children, at age 11 years. This chapter is divided into four sections; internalising and externalising behaviours, child characteristics, parents and caregivers characteristics and socio-economic characteristics. Variables of interest to be examined in this study are discussed in relation to previous research, identifying main and contrasting themes along with trends and gaps in the current literature.

1.2.2 Study aims and objectives

Chapter three outlines the aims, research statement and objectives of the current study.

1.2.3 Methods

Chapter four provides an overview of the research statistical methods including design, instruments and analytical tools that were used in the current study. The chapter also describes the participants, as well as ethics, consent, confidentiality and cultural considerations

1.2.4 Results

Research findings are presented in Chapter five. Simple descriptive analysis is firstly used to define child, maternal and caregiver and socio-economic variables of interest as well as internalising and externalising scores of the cohort. Then bivariate logistic regression was employed to identify significant associations between potential explanatory variables and the internalising and externalising scores. Lastly, a multiple variable model was developed to define group association between the independent child, maternal and socio-economic variables and the internalising and externalising behaviours of interest.

1.2.5 Discussion

Chapter six discusses the research findings and points of interest that arose from the study including the characteristics of the cohort and their families, the distribution of internalising and externalising scores and the social factors that individually and/or collectively could theoretically be associated with internalising or externalising behaviours. This chapter concludes with an overview of the strength and limitations of the current study.

1.2.6 Conclusion and recommendations

Conclusions and recommendations based on the current study's findings are discussed in Chapter seven.

Chapter 2 – Literature review

2.1 Internalising and externalising behaviours

Childhood emotional and behavioural problem behaviours are divided into two groups - internalising or externalising behaviour disorders (Goodman & Scott, 1997). When children internalise their feelings and problems they are likely to be withdrawn, lack interest in activities and have difficulty in interacting with other children (Bergin & Bergin, 2012). In contrast, children with externalising behaviours have poor emotional regulation and are likely to be aggressive and angry, have difficulty following rules and adhering to boundaries (Bergin & Bergin, 2012). The classification of behaviours can be complicated as children may have both internalising and externalising symptoms.

Behavioural problems in children can precede the diagnosis of psychiatric disorders. Internalising-related disorders include depression, anxiety disorders, phobias, obsessive- compulsive disorders, somatisation and schizophrenia (Cooper, Hooper & Thompson, 2005). Attention deficit hyperactivity disorder (ADHD), conduct disorder (CD) and oppositional defiant disorders (ODD) are externalising-related disorders (Cooper, Hooper & Thompson, 2005). There are a number of child and family factors that have been shown to be associated with behavioural problems in children.

2.2 Child characteristics

Child characteristics that may be associated with internalising and externalising behaviours are discussed in relation to the following categories, age and gender, ethnicity and acculturation, bullying, exposure to gangs, achievement at school and self-concept.

2.2.1 Age and gender

Most studies that focus on gender differences in relationship to the presence of internalising and externalising behaviours in children present similar findings. In general, male children are seen as more likely to exhibit externalising behaviours than female children while female children are more likely to have internalising behaviours (Hedley et al., 2012, Pineda, 2007, Rutter, Caspi & Moffitt, 2003).

However, development trajectories for girls and boys were examined by Bongers, Koot, van der Ende and Verhulst (2004) and their research demonstrated significant changes in relation to the age and gender of children. In particular, Bongers et.al, (2004) found that boy's externalising problems were higher in earlier childhood, although by the age of 18 years were similar to girls. The reverse pattern was documented in regard to internalising behaviours; in early childhood boys and girls have similar rates of internalising behaviours but by adolescence the frequency of girl's internalising problems are greater than boys (Bongers et. al, 2004).

Previous research utilising data from the Pacific Island Families Study has also examined gender differences in Pacific children over the early childhood period and has similarly observed some time varying effects. This research documents a greater number of girls exhibiting externalising behaviours at two years, no gender differences at four years and significantly less girls with externalising behaviours at six years of age (Paterson, Taylor, Schluter, Iusitini, 2013). With regard to internalising behaviours, there were no differences recorded at two and four years but significant gender differences were observed at the six year time point with girls more frequently reporting internalising behaviours (Paterson et al, 2013).

Analysis of Pacific Island Families Study's data with no reference to gender (including both male and female child participants) showed the following movements; internalising scores dropped from 22% at four years to 8.5% at six years, and externalising scores increased from 6.7% at four years to 14.6% at six years (Paterson et al., 2013). Examination of data collected in 2006 and 2009, showed children who reported internalising behaviours at six years were more likely to report depressive symptoms at nine years (Paterson, Iustini & Taylor, 2014).

2.2.2 Ethnicity and acculturation

Culture is seen as making a fundamental contribution to a person's self-conception and in turn their ethnic identities. Pacific Island adolescents growing up in Auckland are often exposed in varying degrees to the conflicting demands of two cultures; the traditional Pacific Island culture and local New Zealand non – Polynesian heterogeneous culture where people are predominately of Western or European descent (McCreanor, 2005).

Traditional Pacific Island culture is a collectivistic social system, which is associated with rights of reciprocity, privilege and interdependence (Lustig & Koester, 2003). Members of traditional Pacific Island society have a deeply ingrained sense of family belonging, group co-operation and conformity where members have obligations, specified roles and responsibilities to the church and extended family networks (Vega, 1995). Members typically retain cultural practices and language proficiency pertaining to the individual Pacific region even when living away from home. This is in contrast to New Zealand's non-Polynesian culture where there is an individualistic focus on self and immediate family and independence and autonomy is held in high regard (Lustig & Koester, 2003). Those individuals from Pacific backgrounds that are able to integrate into the local culture will more likely experience less stress than individuals that remain marginalised or pursue assimilation or separation strategies (Berry, 2005).

There is a paucity of research on the specific acculturation experiences of Pacific Island children. However, research on children in minority ethnic groups suggests that conflicting cultural demands and the need of pre-adolescents to 'blend in' can result in stress, and increased risk of internalising or externalising disorders (Connolly, 1998). International research on this topic clearly indicates wide child mental health disparities between minority ethnic population and the dominant local population. A prospective study of Turkish and native adolescents growing up in the Netherlands showed that the Turkish group had significantly more internalising and externalising disorders (Oort, Inez Machenbach et al, 2007). Another prospective longitudinal study of approximately 2,500 adolescents in Norway, also reported poorer mental health outcomes for ethnic minority groups that made up 20% of the sample, in comparison to ethnic Norwegian children (Sagatun et al, 2008).

However, Oakley Brown, Wells & Scott (2006), found that there was less mental health disorders in Pacific Island people born in the Pacific, and suggested that traditional beliefs and lifestyles as well as strong family support protected against the development of mental health problems. These findings were similar to a cross sectional study on minority groups by Atzaba-Poria, Pike and Barratt (2004) that found Indian children living in England with parents that were more traditional in terms of their culture of origin were better adjusted. Support for this view is provided by research by Aycan & Kanungo (1998) that suggests that children with parents that are highly assimilated into the dominant Western culture while retaining minimal traditional attitudes are more likely to exhibit behavioural problems.

It is important to note that over time some Pacific Island families have blended traditional cultural practices with the New Zealand lifestyle. This has led to ensuing NZ-born generations being able to develop a unique identity different from that of their grand-parents and parents and non-Pacific Islands New

Zealanders (Macpherson, 1996). Interestingly, Cowley-Malcolm et al (2009) view this cross-cultural alignment/integration as a potential protective factor against the development of mental health disorders in children and suggest that the softening of disciplinary practice could be a key contributing factor. Similarly, a cross sectional study of foreign-born Latino adolescents residing in North Carolina also found that maintaining family ties and the development bicultural competences provided resilience against the development of disorders (Smokowski & Bacallo, 2007). The degree of a child's and parent's acculturation is clearly an important factor that influences the development of stress and therefore potentially internalising or externalising disorders in children from minority ethnic groups (Berry, 1997; Farver et al 2002).

2.2.3 Bullying

Bullying is defined by the New South Wales (Australia) Government Education Department (n.d) as repeated behaviour towards a child or group of children by an individual or group that involves repeated verbal, physical, social or psychological harassment that is harmful.

There is a growing body of literature on the causes of bullying and its effects on a child's social adjustment. An examination of the Environmental Risk Study data, that followed birth cohort of 2232 children, found that victims at five and seven years had more internalising behaviours and unhappiness at school than controls and that female children showed more externalising behaviours than controls (Arseneault, Walsh, Trzesniewski, Newcombe, Caspi & Moffitt, 2006). Overall results showed at both time points children who were solely victims and children who were both perpetrators and victims showed an increase in internalising problems, externalising problems, and less prosocial behaviours (Arseneault, et al, 2006).

It is also suggested that the effect of bullying is related to the age the bullying started and the duration of it (Lee, Liu, Watson, 2015). To explore the victimisation trajectory of groups Lester and Cross (2014) examined 1810 students transitioning from primary to secondary school and found that male children with both internalising and externalising behaviours and females with externalising behaviours had a higher likelihood of being in the increasing and stable victimised groups than the not bullied group.

The effects of bullying can be moderated or potentiated by many factors. Researchers, including Christie- Mitzeli (2003), see being a victim or perpetrator of bullying as strongly linked to a child's self – concept. Bollmer, Milich, Harris & Maras (2005) explored the self-concept domain of peer relationships in children aged 10 to 13 years. They found effects of bullying behaviour on children with externalising problems could be mitigated by good peer friendships but children with internalising behaviours and poor quality friendships were more likely to be a victim of bullying. (Bollmer, Milich, Harris & Maras, 2005). Examination of the 2007 National Survey of Children's Health data found that children with emotional, developmental, or behavioural problems who were living in poverty and had suboptimal parenting were at increased risk of bullying, while children with involved parents had lower odds of bullying (Shetgiri, Lin, Avila & Flores, 2012).

2.2.4 Exposure to gangs

According to Gilbert (2010, p 17) a gang is 'a structured group (of five or more people) that maintains an exclusive membership marked by common identifiers and formal rules that supersede the rules of the state'. Youth delinquency and youth gang membership are seen to be driven by poor economic circumstances, parental disinterest and poor parenting practices, adult recruitment, need for protection and substitute family and peer pressure (Ministry of Social Development, 2008).

The high youth population combined with depressed economic circumstances of many families in the Counties Manukau region of Auckland makes the area a fertile ground for gang activities. In July 2014 the New Zealand Police reported to the Cabinet Social Policy Committee that there were 3411 patched gang members and 588 gang prospects belonging to 32 adult gangs in New Zealand. Other important statistical information includes; 61% of children of gang members grow up in single parent families, 74% have been abused or neglected on multiple occasions, 51% leave school at age 16 or younger, with no or minimal qualifications (New Zealand Police, 2014).

Externalising behaviours are often a precursor for antisocial behaviours including delinquency, crime and violence (Moffitt 1993). Other research supports this proposition. A study of 1161 male participants in low socio economic schools in Montreal suggested that childhood aggressive externalising behaviours are more likely to lead to higher-level adolescent aggression (Brame, 2001). Loeber, Rolf, Burke, Jeffrey D. Pardini, Dustin A. (2009, p 303) stated that 'externalising behaviours with Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) symptoms appear to be the stepping stone to serious forms of delinquency. Likewise Harachi, Fleming, White, Ensminger, Abbott, Catalano, Haggerty (2006) found that higher aggressive behaviours in girls and boys especially were a predictor for violent behaviours, delinquency and substance abuse in later years and this risk was potentiated by low parental education and income.

2.2.5 Achievement at school

Numerous authors demonstrate a strong relationship between internalising and externalising disorders in childhood and low academic achievement at school (Appleton, Christenson, Kim, & Reschly, 2006; Archambault, Janosz, Morizot, & Pagani, 2009). The Dunedin Multidisciplinary Health and Development Research Study (DMHDS) that follows 1037 babies born between 1 April 1972 & 31 March 1973 at the Queen Mary Hospital. This longitudinal study utilising a cross sectional

approach to assess children's reading ability at age seven years and concluded that poor reading ability was a predictor of externalising symptoms (Pisecco, Wristers, Swank, Silva & Baker, 2001). Fleming et al (2004) in a study of approximately 700 students from grade three to six found that children from low income families had lower reading scores and this was associated with increased number of attention and behavioural problems. However there are some inconsistencies in the literature. For example, a longitudinal study in Detroit specifically found that only children with attention disorders at age six years had lower math and reading achievement at 17 years but internalising and externalising were not significantly related to later academic achievement. (Breslau, Miller, Breslau, Bohnert, Lucia & Schweitzer, 2009). Their research also speculated that children with attention disorders had difficulty focusing on educational activities and were thus less able to acquire the basic skills necessary to achieve, this lack of achievement leading to decreased motivation and effort (Breslau et al, 2015).

High levels of intellectual capacity and self-confidence provide some protection against the development of emotional and behavioural problems (Carr, 2006). Further support for this proposition, is presented by Ey et al., (2005) and Furrer and Skinner (2006) both finding that high levels of academic achievement and engagement are not commonly associated with the development of emotional and behavioural problems. Additionally, children with high optimism scores are reported as having less depressive symptoms, while children who were pessimistic about academic and social deficiencies were more likely to have anxiety symptoms (Ey et al., 2005). The Pacific Island Families Study had similar findings with previous work suggesting that children with a positive outlook about their capabilities and school performance had lower depression scores (Paterson, et al, 2014).

2.2.6 Self-concept

Self-concept and self-esteem may be considered comparable or interchangeable terms. Self-concept is referred to by Smith, Cowie and Blades (p 185, 2005) as a general term for 'how people think about themselves'. Self-esteem is described by Houck and Spelman (1999) as how a child feels about themselves across various domains. A child's self-esteem is drawn from how they compare themselves to others as well as through input from influential persons in that their life (Smith, Cowie & Blades, 2005). Self-esteem provides a positive or negative outlook in relation to academic, sporting performance and peer and parental relationships.

A descriptive correlational study by Houck, Kendall, Miller, Morrell & Wiebe (2010) examined the relationship between behavioural problems and self-concept in 145 children aged between six and 18 years ($M = 10.92$). This study found that children with internalising problems had lower self-concept and children with externalising problems especially Attention Deficit Hyperactivity Disorder (Houck et al. 2010). It was also noted that self-concept over time in these children decreases, thus highlighting the importance of early intervention to prevent downhill spirals (Houck et al. 2010).

There are a number of studies that focus on the particular self-concept domains. A cross sectional study using secondary data from the National Survey of Child and Adolescent Well-Being (NSCAW) in Ithaca New York examined children's perceptions of internalising and externalising behaviours and the self-perception of their relationship with caregivers. The sample had 188 participants and a mean age of 13 years. For both internalising and externalising behaviours, significant associations were found with $p < 0.05$ between youths' perception of relationships with caregivers and the caregivers' perception of the youths' internalising or externalising behaviours (Cooley, Wojciak, Farineau & Mullis, 2015). Children who rated their relationship with the caregiver highly had lower

internalising or externalising scores than children who did not have positive caregiver relationships. Cooley, Wojciak, Farineau and Mullis (2015) concluded that positive caregiver relationships were a protective factor.

Research from the Ohio State University by Newman, Lohman and Newman (2007) focused on peer group membership and a sense of belonging in 733 adolescents aged from 11 to 18 years. After controlling for potential confounders it showed that having 'a sense of peer group belonging was negatively related to internalising and externalising behaviour problems' (Newman, Lohman & Newman, 2007, p241). Children who valued peer group membership and scored themselves positively in regard to a sense of peer belonging experienced significantly fewer behavioural problems. The Bergin Child Study has produced results in a similar vein, and emphasised the importance of social acceptance and peer relationships in middle childhood (Ekornas, Heimann, Tjus, Heyerdahl & Lundervold, 2011). Masten (2005) was more specific, finding that children who were unable to meet social expectations had a greater risk of depressed psychological functioning.

Academic achievement and educational attainment, being engaged and having a sense of belonging at school are generally seen as having a positive influence on self-concept while problematic school outcomes are assumed to arise from disengagement (Lerner, Bornstein, & Leventhal, 2015). Interestingly, March and Hau (2003) state that academic self-concept is related to how children see themselves relative to others in their classroom, and they may see themselves as academically capable as long as they are doing better than their peers. A study of 709 German school children with a mean age of 11.83 years demonstrated that positive academic self-enhancement was also a predictor of self-perceived well-being and peer popularity (Dufner, Reitz & Zander, 2015). However, the Dunedin Multidisciplinary Health and Development Study explored the effect of academic self-concept on the development of attention deficit hyperactivity disorder in 445

participants and found that academic self-concept did not predict Attention Deficit Behaviours in early adolescence (Pisecco, Wristers, Swank, Silva & Baker, 2001).

The relationship between participation in sport and increased emotional well-being in children is also well documented. A study of 201 children across two time points by Finday and Coplan (2008) found that sport participation was associated with positive self-esteem and social skills and additionally stated that some shy children had decreases in anxiety when participating in sport. Similar results were observed by Donaldson and Ronan (2006), their study of 203 children aged 11 to 13 years found that increased levels of formal and informal sport participation was positively correlated with self-concept.

2.3 Parents and caregivers characteristics

Parental characteristics that may be associated with internalising and externalising behaviours are discussed in relation to the following categories, primary caregiver, parental marital status and level of maternal education.

2.3.1 Primary caregiver

Mothers are usually a child's primary caregiver with the major responsibility for home and family. A mother typically spends more time with the child throughout their early years than other significant persons in the child's life. Maternal and other primary caregiver relationships need to be "consistent, warm and sensitive" and lay the foundations for a positive view of themselves (Bornstein, Leventhal & Lerner 2015, p 226). Poor maternal mental health that results in poor mother-child attachment is one of the consistently referenced biological and physiological predictors of emotional and behavioural problems in children.

The Pacific Island Families Study researchers have undertaken a substantial amount of research that specifically explores the relationship between child behavioural problems and maternal psychological disorders. Gao, Paterson, Abbott, Carter and Iusitini (2007) found that mothers who had depressive symptoms at 6 weeks or mental health disorders at 12 or 24 months after the birth of a child were more likely to have children with internalising disorders at two years. Further research from the Pacific Island Families Study on children at ages four and six years also produced comparable results; finding that internalising behaviours were more prevalent in children with mothers who had symptomatic maternal depression (Paterson, Taylor, Schulters & Iusitini, 2013). Similarly Rodriguez (2011) explored the relationship between mother's stress; depression and anxiety symptoms in their offspring and found there was a positive relationship. Raudino, Fergusson, Woodward and Horwood (2013) examined a subgroup of the Christchurch Health and Development Study and suggest there is a reasonable hereditary association between parental and offspring conduct problems.

2.3.2 Marital status

Changes of parental marital or partnership status are widely recognised having the potential to influence a child's well-being. Parental separation can affect basic family functioning, and for the child the consequences can be significant; loss of after school and bedtime routines, loss of family and cultural activities and changes to the family's place of residence and economic circumstances. The family can be dysfunctional for a prolonged period of time when the pre-separation or pre-divorce period is taken into account (Fergusson & Horwood, 2001). It is clear that the effects of parental separation can be mitigated or intensified by personal traits and/or the availability of wider family support networks. Very young children may not be cognisant of the situation, while those in middle childhood are very aware of changes in parental relationships but may lack the ability to cope with changed family circumstances, while older children

may have greater maturity and resilience to rationalise and come to terms with the new arrangements.

An overview of findings from the Christchurch Health and Development Study (CHDS) following 1265 participants born in Christchurch between 15 April and 5 August, 1977 showed that exposure to parental separation and divorce was a risk factor for both internalising and externalising disorders as well as later conduct problems and substance abuse in later adolescent years (Fergusson & Horwood, 2001). The Pacific Islands Families Study found that having a single mother was a significant risk factor for externalising disorders in children at two, four and six-years of age (Paterson et al, 2013). A report for Family First New Zealand by Mitchell (2016, p10) states that 'children living in sole-parent (SP) households experience significantly higher poverty rates than those in two-parent.' A study of urban families in the United States by Ivanova and Israel (2006) has shown that boys at age eight were more vulnerable to the effects of parental separation than girls. Not surprisingly, Peterson and Zill (1989) found the incidence of behavioural problems increased with multiple marital transitions. A meta-analysis of 92 studies found that children from divorced, single parent families scored lower across behavioural measures than children from intact families (Amato & Keith, 1991). These authors attribute the effects of parental separation on children, to three theoretical perspectives; parental loss, economic deprivation and family conflict, (Amato & Keith, 1991).

2.3.3 Maternal education

Higher levels of maternal education influences the well-being in children including decreasing the incidence of emotional and behavioural problems in children (Carneiro, Meghir & Parey, 2011). The Pacific Island Families study examined children at nine years and found that those with mothers who had post-secondary school qualifications had significantly lower internalising symptoms (Paterson, Iustini & Taylor, 2014). Earlier PIF research also found that post-school

qualifications were associated with high nurturance behaviour amongst mothers while low nurturing behaviours were associated with post-natal depression, gambling and heavy alcohol use (Cowley-Malcolm et al, 2009).

There are a plethora of possible reasons for these findings suggesting there are better outcomes for children with mothers who have higher levels of education. Typically better educated mothers will have spouse with higher education, have children at a later stage and obtain better jobs with higher earning potential and therefore higher family income. Higher education gives mothers literacy skills and competence to access health services. Mothers with higher education may also be more adept at assisting their children to build resilience against other risk factors to which they may be potentially exposed (Newman, 2004).

2.4 Socio-economic characteristics

Socio-economic characteristics that may be associated with internalising and externalising behaviours are discussed in relation to the following: weekly income and household size.

2.4.1 Weekly income

A family's income influences where a child lives, where they receive their schooling and their ability to access resources. Minority groups often have poorer economic circumstances and therefore face multiple disadvantaging factors (Floor, Oort, Inez et al, 2007). It is widely agreed that financial hardship is related to adverse educational, health and social outcomes for children. A growing number of studies document the association between internalising and externalising disorders and low household income.

The Christchurch Health and Development Study, found that low family income especially when combined with other biological and physiological disadvantages, is a significant risk factor for emotional and behavioural problems (Fergusson & Horwood, 2001). Socially disadvantaging factors that resulted in children having multiple behavioural problems were low parental education, young parents, single parents, unplanned pregnancy, children born ex-nuptially, poor antenatal care and less religious commitment (Fergusson, Horwood & Lynskey, 1994). This research showed that 87% of children at 15 years of age from socially and economically disadvantaged backgrounds were recognised as having at least one behavioural or mental health problem, while 80% of children from advantaged backgrounds at the same age were problem free. Other cohort studies report similar findings. A bivariate analysis by Leech, Larkby, Day & Day, (2006) found that children at age 10 years from low income populations had higher levels of internalising disorders if they came from high density, crowded households that lacked social support and/or had mothers that had used substance during their pregnancy (Leech, Larkby, Day & Day, 2006).

The Trails Study in Holland found that poorer family circumstances was a significant predictor of mental health problems in children at ages 11 to 13 years (Bakker, Ormel, Verhulst & Oldehinkel, 2011). Research by Burchinal, Roberts, Zeisei and Hooper (2006) also identified negative social circumstances increased the risk of problematic behaviours in children but additionally suggested that the quality of the home and childcare environment was a potential protective factors against the development of disorders. The Pacific Island Families Study found there was a relationship between low-income families and children's externalising problems (Paterson et al, 2013). A Hawkes Bay study similarly concluded that children from deprived backgrounds had a higher risk of disorders (Hedley et al., 2012). Oakley Brown et al., (2006) acknowledge that second generation Pacific Island people in New Zealand are likely to be growing up in relative poverty, which affects the family's cultural base and ability to function and provide a high quality home and child care environment.

2.4.2 Household size

The average household size in New Zealand was 2.6 persons per household in 2006 and is predicted to decrease to 2.4 persons per household by 2031 (Department of Statistics 2011). However, Goodyear and Fabian (2014) reported that 45.3 percent of Pacific people are living in overcrowded households. The largest concentration of Pacific people are in the Mangere - Otahuhu, Otara-Papatoetoe and Manurewa areas in South Auckland and their households are typically large, often intergenerational and may accommodate more than one family group (Auckland Council, 2016). It is also important to note that there are often interrelated disadvantaging factors with families living in overcrowded households. These include dealing with a multitude of issues including lack of stability leading to forced moves, lower level of education and skills, high levels of unemployment and lower income levels (Auckland Councils, 2016).

Living in a crowded household has negative consequences for children's well-being as the lack of their own space impacts on privacy and the abilities to concentrate on school work and enjoy uninterrupted sleep (Solari & Mare, 2012). This research examined data from various waves of the Panel Study of Income Dynamics Child's Child Development Supplement and the Los Angeles Family Neighbourhood Survey with sample sizes from 1,808 to 2,304 children. They found that children's reading and maths scores decreased and children's behavioural problems such as becoming withdrawn and depressed or displaying a strong temper increased when households became overcrowded (Solari and Mare, 2012). They further specify that an additional person per room is expected to increase children's internalising behavioural problems, by 2.6% and increase externalising behavioural problems by 4.4% (Solari and Mare, 2012). Likewise Evans, Lercher and Kofler (2002) in their study of 1,280 children with a mean age of 9.44 years living in the Tyrol (Austria) found that more crowded households including multiple family and row housing reported lower levels of psychological well-being than children residing in single detached homes.

Chapter 3 – Study aims and objectives

This chapter presents the study aims, the overarching research statement and key study objectives.

3.1 Study aims

The aims of this project are to (1) identify the distribution of internalising and externalising behaviours in Pacific Island children at 11 years, (2) isolate the social factors associated with internalising and externalising behaviours, and (3) explore the relationships between family, childhood and socio-economic factors, and determine whether specific combinations of factors potentially have a greater effect on behaviours.

3.2 Research statement

The demographic profile of the PIF cohort is reflective of the wider Pacific Island population profile in Auckland. The primary school years are recognized as laying the foundation for adolescent as well as later adult behaviours (Mah & Ford-Jones, (2012). Understanding the prevalence as well as the correlation between the social factors associated with internalising and externalising behaviours in the cohort could make a major contribution to identifying children at risk of developing externalising or internalising behaviours. It is anticipated that this project will assist health organisations and government bodies to make informed decisions on initiatives which will potentially address health disparities.

3.3 Objectives

The key objectives of the study are to describe:

- the distribution of internalising and externalising behaviours in PIF Study children at age 11 years?
- the social factors associated with internalising or externalising behaviours at age 11 years?
- the relationships between social factors, and whether specific combinations of factors potentially have a greater association on internalising or externalising behaviours at age 11 years?

Chapter 4 – Methods

4.1 Pacific Island Families (PIF) Study design

The PIF Study is a longitudinal, multi-disciplinary study that follows a birth cohort of 1376 Pacific babies and their families. The PIF study employs a prospective cohort design where data on children's behaviour and family circumstances that to date have been collected across seven time points from 2000 to 2015. Data collection utilises a multi informant approach, including participants, parental and teacher interviews. Child and parental interviews were conducted by Pacific interviewers fluent in both English and a Pacific language in the participants own home. When possible interviewer ethnically matched to the participant.

This research utilises the data collected in year 11 from the PIF cohort and thus is cross sectional in nature. Variables of particular interest in relation to this research are family characteristics, child characteristics, and socio economic characteristics (family income and household size). The family characteristics from parental interviews include the child's relationship to primary caregiver, mother's marital status and family stability and level of maternal education. Whereas, child characteristics from both child and teacher interviews include gender, ethnicity, cultural alignment, achievement at school, self-perception engagement at school, in sport and with parents and peers, exposure to bullying and contact with gangs.

4.2 Participants

The cohort participants are Pacific Island babies born at Middlemore Hospital in Auckland, New Zealand between March 15 and December 17, 2000. To be eligible to participate in the study, a child must have one parent that self-identified as being of Pacific Island ethnicity and was a New Zealand permanent resident at the time of their birth. The original investigation started with 1398 infants, which included 22 sets of twins. At six years, there was a participant rate of 72.9% as

1001 mothers completed interviews in relation to 1019 children. At 11 years, there was a participant rate of 74.9%, 1029 mothers completed interviews in relation to 1047 children. At this time point, 952 child assessments, 707 teacher questionnaires and 790 paternal interviews were completed. The ethnic mix of the cohort is seen as reflective of the wider Pacific population in Auckland, 49% Samoan, 23% Cook Island Māori, 18% Tongan and 9% Niuean (Statistics New Zealand, 2001).

4.3 Instruments

This study focuses on data collected from the PIFS cohort at 11 years utilising the following instruments.

4.3.1 Socio-demographic information

General demographic information was obtained from data collected at the 11 year time point, this included information on child's gender and ethnicity, mother's marital status and relationship to child as well as family income and house size. Mother's marital status and relationship to child were also examined at the six week time point and comparisons were made to the eleven year time point.

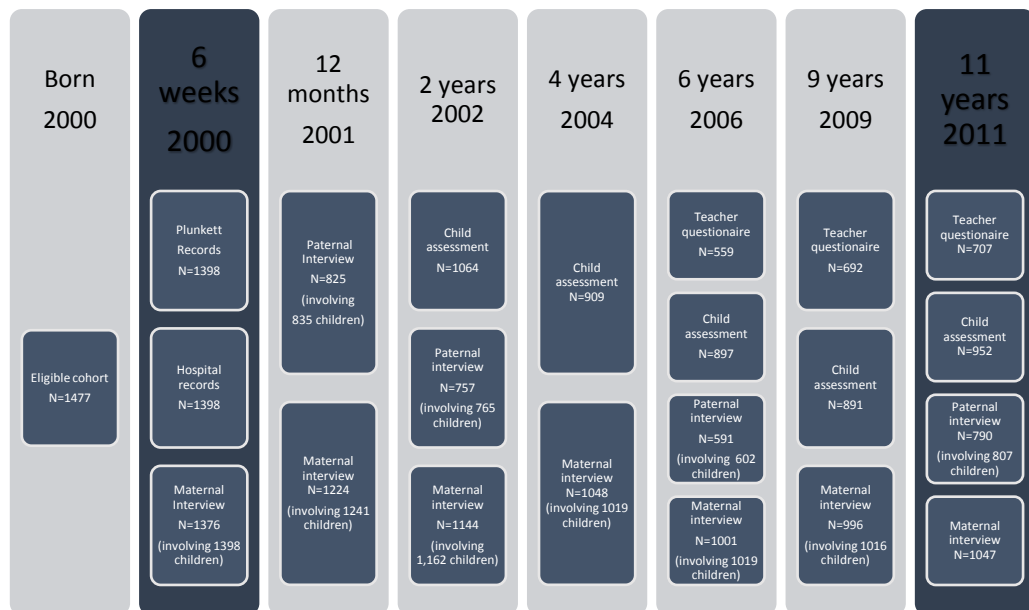


Figure 4.1.1 Data collection records for the PIF Study from 2000 to 2011

4.3.2 General ethnicity questionnaire (acculturation)

A shortened version of the General Ethnicity Questionnaire (GEQ) was used to assess cultural alignment (Tsai et al., 2000). The degree to which an individual or family unit is aligned to a culture can be reflected in multiple ways including changes to beliefs, values, family and social groups. The GEQ utilises a 5 point Likert scale from requiring responses from Strongly Disagree - 1, Disagree - 2, Neutral - 3, Agree - 4 and Strongly Agree - 5. Highest scores are aligned with ‘assimilation’; next level with ‘integration’, next level with ‘separation’; and the lowest range scores indicating ‘marginalisation’. The PIFS study refined the tool to suit Pacific Island/New Zealand cultural backgrounds. The ‘integration’ scores are seen as retaining cultural integrity while being a part of New Zealand society (Gao et al., 2007). The reliability testing of the GEQ tool across many different population samples, has consistently returned Cronbach alphas scores that are above .80 (Huynh, Howell and Benet-Martínez, 2009).

4.3.3 Child behaviour checklist

Child behaviour was assessed using the Achenbach and Rescorla’s (2001) 120-item rating scale CBCL/6-18. This tool uses a three-point Likert scale and has been

specifically developed to assess children in middle childhood years in relation to clinically significant internalising and externalising disorders. Scores are allocated according to responses; Not True, 1 = Sometimes True, 2 = Often True. Previous research by Paterson et al. (2013) on the cohort refers Cronbach's alpha scores vary from 0.76 to 0.93 and internal reliability and validity.

4.3.4 Gang involvement

A child's involvement in gang activities was assessed with a modified version of the Gang Membership Inventory (Pillen & Hoewing-Robertson, 1992). This self-reporting tool asks four true/false questions about whether the child; has family members including extended family who belong to a gang, has friends that are part of a gang, had an involvement with gangs in terms of wearing gang colours or using gang signs, and representing a gang in fights or delinquent activities. This measure at the nine year time point and was considered to have good internal consistency of 0.83.23 (Paterson, Lusitini & Taylor, 2014).

4.3.5 Bullying

The prevalence of bullying behaviours was assessed with an amended Olweus Bully/Victim Scale (Olweus, 1996). Children were asked eight 'yes' or 'no' questions that assess general bullying, victimisation and perpetration. Questions explore the type of bullying behaviours they may have exhibited or been subject to including verbal abuse, physical abuse and social exclusion. The questions are asked with reference to a specific period, which is "the past couple of months," to make children focus on recent behaviours and experiences. This scale is seen by Kyriakides, Kaloyirou & Lindsay (2006) as having good internal consistency ($\alpha = 0.86$) and acceptable psychometric properties.

4.3.6 Perception of self

Ten questions from the Self-Description Questionnaire developed by Marsh (1994) were asked to assess how children perceived their relationships with their parents and peers, achievements and enjoyment of sporting and school activities

on a 5 point Likert scale from strongly disagree to strongly agree. Five pairs of questions were related to very similar subject areas i.e. 'My parents like me' and 'I get along well with my parents.' This questionnaire was used previously in the PIF study at the nine year time point and is cited as having strong construct validity (Paterson, Iustini & Taylor, 2014).

4.3.7 Teacher questionnaire

Achievement at school was assessed from the results of a short teacher's questionnaire designed by the study team. It comprises six sections that cover teacher details including cultural group and years teaching, child details including length of time at school, attendance and reasons for absences, special needs and parental involvement including homework completion, child's academic performance and child's behaviour. This study only uses the teacher's assessment of the child's academic performance and ability to follow instructions in the classroom. A child's academic performance was assessed on a five point Likert scale from very poor, needs improvement, satisfactory, very good and excellent in reading, written language, oral language, maths and ability to follow classroom instructions. Again, this assessment was used previously in the PIF study at the nine year time point and is cited as having Cronbach's $\alpha=0.92$, however this new tool has not been formally evaluated. (Paterson, Iustini & Taylor, 2014).

4.4 Ethics

4.4.1 PIF study dataset

Ethics approval for the PIF study was obtained from the Auckland Branch of the National Ethics Committee in 1999. The study has also been endorsed by Royal New Zealand Plunket Society and the South Auckland Health Clinical Board. (Paterson et al.2002). The AUTECH Research Ethics Advisor has confirmed in writing on the 16 September, 2014 that no additional ethics approval is required as this

project that uses de-identified and aggregated data from the PIFS for a statistical analysis.

4.4.2 Consent

Consent to participate was gained at the beginning of each stage of the study. Mothers gave written and verbal consent for their participation as well as that of their children. For later stages of the research, children were asked to sign a letter of assent agreeing to be involved in the research. All consent was informed and voluntary. Information about the aim, purpose, possible benefits and their role in the research was given to participants in everyday language. Written information, including the researcher's details, was provided to accommodate any questions. Participants had time to consider and discuss information with family and support persons before deciding to participate. Mothers and their children are told that they can withdraw from the research at any time.

4.4.3 Confidentiality

This project adheres to all the PIF study's privacy and confidentiality obligations. Data will be managed and stored according to the Privacy Act 1994. Each participant receives an identification number. Identification information is stored separately from actual data and all information is locked and secured to ensure anonymity and confidentiality. This project does not personally identify participants in reports. There is a protocol ensuring that authorisation of the Co-Directors of the PIF study is provided before any other researcher has access to actual data.

4.4.4 Cultural considerations

There has been extensive consultation and involvement with the representatives of Pacific Islands Communities, the Pacific Island Advisory Board and other stakeholders regarding the PIF study's design and its development and progress. This stakeholder involvement and the following stringent interview protocols

have ensured participants are protected from physical and psychological harm. All field researchers who visit and interview participants, are fluent in English and a Pacific Island language to ensure culturally appropriate interactions. If requested, participants are interviewed in their own language.

4.4.5 Data analysis

Data that has been collected at the 11 year time point has been double-entered into a web-based database and analysed using the Statistical Package for the Social Sciences (IBM, version 20). Before analysis, data has been checked for recording or entry mistakes. The statistical significance threshold was set at 5% against two-sided alternatives for all hypothesis tests.

Question 1: What is the distribution of internalising or externalising behaviours in children in the Pacific Islands Families Study at 11 years?

Descriptive statistics were used to describe the distribution of children with internalising or externalising scores. To explore the variation and dispersion of internalising and externalising data, the mean, the standard deviation and the interquartile ranges of scores were established.

Question 2: What are the social factors associated with internalising or externalising behaviours at age 11 years?

The scores for internalising or externalising behaviours were categorised into upper quartile scores versus the rest as the dependent dichotomous variables of interest. Logistic regression will be used to establish whether there was a relationship between the dependent categorical variable, and the selected independent variable. Independent child variables of interest are child's gender, ethnicity, acculturation, whether they have been a victim or perpetrator of bullying, whether they had any exposure to or involvement with gangs, their achievement at school and perception of self. Mother's or primary caregiver variables of interest are marital status, marital stability and level of mother's

education. Socio-economic variables of interest are household size, primary caregiver and partner's weekly income. The small number of responses in some of the sections in the teacher assessments and peer relationship questions made it necessary to recode results into two groups for the analysis.

Question 3: Are there relationships between social factors, and do specific combinations of factors have greater significance?

A multiple logistic regression model was built to establish the best subset of independent variables that describe the dependent variable. Variables that were established as having p-values ≤ 0.2 in the bivariate logistic regression model were entered into a multiple variate model building process to measure the relationship between the selected categorical dependent variable and the selected independent variables. This cumulative model building process then eliminate variables not of interest and left variables of interest with $p \leq 0.05$, making up the final model.

Chapter 5 – Results

5.1 Descriptive analysis – children

5.1.1 Gender

The original PIF study cohort comprised of 1,376 mothers and 1,398 children of whom 44 children (22 pairs) were twins. At the 11 year time point there were 1047 remaining child participants, 76% of the original cohort comprising of 522 female children and 525 male children.

5.1.2 Ethnicity

The cohort was comprised of three major ethnic groups. At the 11 year time point, there were 476 (45.5%) Samoan, 237 (22.6 %) Tongans and 174 (16.6%) Cook Islands child participants. Additionally, there was a smaller group of 51 (4.9%) participants from Niue. The remaining 109 (10.4%) of participants had mothers who identified with two or more Pacific groups or had mothers that identified with Pacific groups other than individually specified groups. The ethnic composition of the cohort was broadly representative of the Pacific Island population in New Zealand (Statistics New Zealand, 2001). It is noted that the PIF classification is weighted towards the Pacific component of ethnicity while Statistics New Zealand conversely identifies Pacific infants with a Māori mother as Māori.

5.1.3 Acculturation

With respect to acculturation status, there were 998 children who completed the General Ethnicity Questionnaire (GEQ). There were 421 (42.2%) children who were categorised as being assimilated into the New Zealand culture, 291 (29.1%) children were identified as separationists retaining their own culture and not adopting the New Zealand norms, and 101 (10.1%) children who were categorised as integrated into New Zealand society but still retaining their Pacific Island

culture. Lastly, there were 185 (18.5%) children described as marginalised from their original Pacific Island as well as the wider New Zealand culture.

5.1.4 Bullying

There were 943 responses to the bullying questionnaire, 329 (31.4%) children stated that they had been a perpetrator of bullying and 527 (50.3%) children stated that they had been subject of some form of bullying and 274 (26.2%) children identified themselves as both a victim as well as a perpetrator of bullying. A detailed breakdown of responses are illustrated in Table 5.1.1.

Table 5.1.1

Number and percentage of yes/no responses relation to be a victim or perpetrator of bullying.

		Number	%
Victim of (any) bullying	No	416	39.7
	Yes	527	50.3
	Missing	104	9.9
Perpetrator of (any) bullying	No	614	58.6
	Yes	329	31.4
	Missing	104	9.9
Victim & Perpetrator of any			
Bullying	No	669	63.9
	Yes	274	26.2
	Missing	104	9.9

5.1.5 Exposure to gangs

The majority of both male and female children indicated that they had no exposure to gangs. Male children’s affirmative responses were slightly higher than female responses across all gang questions. The largest percentage of positive answers across both sexes was in relation to “family members being part of a gang”; 22% for males and 16% for females. Conversely, the lowest percentage of positive answers was in relation to the “gang representation” question, 3% for males and only 1% for females. A detailed breakdown of responses are illustrated in Table 5.1.2.

Table 5.1.2

Number and percentage of yes/no responses by gender in relation to gang questions.

Question	No	No	Yes	Yes	Total
	Female	Male	Female	Male	
Family members part of a gang?	389 (84%)	354 (78%)	76 (16%)	100 (22%)	919
Friends part of a gang?	405 (86%)	362 (79%)	64 (14%)	94 (21%)	925
Wears gang colours or using gang signs?	454 (95%)	421 (91%)	26 (5%)	43 (9%)	944
Gang representation?	477 (99%)	450 (97%)	4 (1%)	14 (3%)	945

5.1.6 Self-concept

A total of 946 children answered all items in the Self-Description Questionnaire. There was a significantly larger percentage of positive responses across all questions from both male and female children when compared to negative

responses. There was also a large variance in the percentage of “neither agree nor disagree” responses which ranged from 1.3% to 27.3%.

There was a higher percentage of positive responses and a lower percentage of negative responses to the majority of questions for female children when compared to male children. The exception being the two sports related questions where boys’ positive responses were higher in the “agree” and “strongly agree” categories and lower in the “strongly disagree” and “disagree” categories when compared to female children. The question “My parents/guardians likes me” received the highest percentage of positive responses; 95.2% for females and 94% for males and the lowest level of negative responses; 0.6 % for females and 1.5% for males. The question “Other people think I am a good person” received the lowest level of positive responses 72.1% for females and 67.6% for males and the question “I am good at school work” received the highest level of negative responses 5.4% for females and 7.3% for males.

The majority of children responded positively to the question “I enjoy doing school work;” 85.9% for females and 82.4% for males but responses to the question “I am good at school work;” were slightly less positive with 72.8% for females and 68% for males. A similar drop was seen in the answers to the two sport related questions with 91.7% of females and 97.4% for males answering positively to the question “I enjoy sports and games” and 82.3% of females and 89.3% of males answering positively to the question “I am good at sports.” Responses to peer relationship questions are shown in Table 5.1.3.

Table 5.1.3

Children's responses in relation to their physical and school activities, parental and peer relationships.

Child's gender	Strongly disagree	Disagree	Neither agree /disagree	Agree	Strongly agree	Total
I get on with other kids easily						
Female	3 (0.6%)	11 (2.3%)	59 (12.3%)	235(48.8%)	173 (36.0%)	481
Male	6 (1.3%)	20 (4.3%)	65 (13.8%)	211 (45.0%)	167 (35.6%)	469
I enjoy doing school work						
Female	9 (1.9%)	7 (1.4%)	52 (10.8%)	168 (35.0%)	245 (50.9%)	481
Male	11 (2.3%)	18 (3.8%)	53 (11.3%)	202 (43.1%)	185 (39.4%)	469
My parents/guardians like me						
Female	2 (0.4%)	1 (0.2%)	20 (4.2%)	104 (21.6%)	354 (73.6%)	481
Male	4 (0.9%)	3 (0.6%)	21 (4.4%)	122 (26.0%)	319 (68.0%)	469
Other people think I am a good person						
Female	1 (.2%)	13 (2.7%)	119 (24.9%)	240 (50.3%)	104 (21.8%)	477
Male	2 (.4%)	22 (4.7%)	128 (27.3%)	235 (50.1%)	82 (17.5%)	469
I enjoy sport and games						
Female	5 (1.0%)	11 (2.3%)	24 (5.0%)	104 (21.6%)	337 (70.1%)	481
Male	2 (0.4%)	4 (0.9%)	6 (1.3%)	70 (14.9%)	387 (82.5%)	469
Other kids want me to be their friend						
Female	2 (0.4%)	8 (1.7%)	99 (20.6%)	231 (48.1%)	140 (29.2%)	480
Male	5 (1.1%)	8 (1.7%)	110 (23.5%)	215 (45.8%)	131 (27.9%)	469
I am good at school work						
Female	4 (0.8%)	22 (4.6%)	105 (21.8%)	225 (46.8%)	125 (26.0%)	481
Male	5 (1.1%)	29 (6.2%)	116 (24.7%)	218 (46.5%)	101 (21.5%)	469
I get along well with my parents						
Female	4 (0.8%)	7 (1.4%)	20 (4.2%)	123 (25.6%)	327 (68%)	481
Male	5 (1.1%)	4 (0.9%)	29 (6.2%)	125 (26.6%)	306 (65.2%)	469
A lot of things about me are good						
Female	4 (0.8%)	8 (1.7%)	81 (16.8%)	196 (40.7%)	192 (39.9%)	481
Male	5 (1.1%)	22 (4.7%)	93 (19.8%)	227 (48.4%)	122 (26.0%)	469
I am good at sports						
Female	12 (2.5%)	18 (3.7%)	55 (11.4%)	152 (31.6%)	244 (50.7%)	481
Male	4 (0.1%)	7 (0.2%)	39 (0.8%)	124 (26.4%)	295 (62.9%)	469

5.1.7 Achievement at school

Children' school performance in reading, oral and written language, maths and their ability to follow classroom procedures were assessed by children's teachers as being satisfactory, very good or excellent. Between 50% to 60% of children were assessed as being in the satisfactory or very good categories in all questions. Female children's results were superior to males across all categories with exception of maths, where male children out performed females in both the very good and excellent categories; very good female = 22.7% & male = 25.1%, and excellent female = 7.4% & male = 9.6. The best results for female children were oral language (13.7%) and ability to follow instructions (44.5%), were assessed as excellent. The best results for males reading (10.7%) and ability to follow instructions (22.2%) were assessed as excellent. The lowest results for males, was reading (36.1%) and written language (45.5%), being assessed as very poor or needing improvement. Conversely, the lowest results for females, was maths (33.3%) and written language (29 %), was assessed as very poor or needing improvement. Results are shown in Table 5.1.4.

Table 5.1.4

Teacher assessments of children's reading, language, maths & ability to follow classroom procedures.

Assessment Categories						
	Very poor	Needs Improvement	Satisfactory	Very Good	Excellent	Total
Evaluation of Reading						
Female	17 (4.6%)	76 (20.8%)	132 (36.2%)	98 (26.9%)	42 (11.5%)	365
Male	38(11.3%)	83 (24.8%)	105 (31.3%)	73 (21.8%)	36 (10.7%)	335
Evaluation of oral language						
Female	10 (2.7%)	63 (17.2%)	153 (41.8%)	90 (24.6%)	50 (13.7%)	366
Male	18 (5.4%)	81 (24.2%)	133 (39.7%)	76 (22.7%)	27 (8.0%)	335
Evaluation of written language						
Female	16 (4.4%)	90 (24.6%)	143 (39.1%)	88 (24.0%)	29 (7.9%)	366
Male	42(12.6%)	110 (32.9%)	107 (32.0%)	60 (18.0%)	15 (4.5%)	334
Evaluation of maths						
Female	21 (5.7%)	101(27.6%)	134 (36.6%)	83 (22.7%)	27 (7.4%)	366
Male	28 (8.4%)	89 (26.9%)	99 (30.0%)	84 (25.1%)	32 (9.6%)	332
Evaluation of following classroom procedures						
Female	3 (0.8%)	27 (7.4%)	58 (15.8%)	115(31.4%)	163 (44.5%)	366
Male	7 (2.1%)	58 (17.4%)	103 (30.8%)	92 (27.5%)	74 (22.2%)	334

5.2 Descriptive analysis – parents and caregivers

5.2.1 Primary caregiver

At the 11 year time point 981 (97.3%) of children lived with their birth mother. There were small numbers of children that lived with adoptive mothers (n = 5, 0.5%) and foster mothers (n = 2, 0.2%). However, there were 59 children who lived with extended family members which was a significant change to six-week figures that recorded only one child being cared for by a grandparent. Changes in primary caregiver's relationship to the children and marital status at six -weeks and at 11 years are presented Table 5.2.1.

Table 5.2.1*Primary care givers relationship to child at 6 weeks and 11 years.*

Relationship with child						
	6 weeks	%	11 years	%	Change	% Change
Birth Mother	1041	99.4	981	97.3	- 60	2.1
Adoptive mother	4	.4	5	.5	1	.1
Foster Mother	1	.1	2	.2	1	.1
Other	1*	.1	59	5.6	58	5.5
Total	1047	100	1047	100		

Notes: (* Other was identified as a grandmother.)

5.2.2 Marital status

At the 11 year time point, approximately 80% of children in the cohort were residing with their parents, 61.5% of the parents were legally married and 18.1% were in a de-facto relationship. The remaining 20.2% of children were residing with a single parent or a member of their extended family. There was no response from 2 (0.2%) participants. Of note, when compared to the six-week postpartum time point, there was a decrease in de-facto relationships reducing by 4.8% and an increase in those parents that were legally married of 3%. Table 5.2.2 below displays these results.

Table 5.2.2*Marital Status of primary care givers at 6 weeks and 11 years*

Marital Status	6 weeks	Percent	11 years	Percent	Change	%
Partnered	613	58.5	644	61.5	31	3
De-facto	240	22.9	190	18.1	- 50	- 4.8
Non-partnered	194	18.5	211	20.2	17	1.5
No response			2	.2		

5.2.3 Mother's highest education

There were 1039 mothers who answered the question about the highest level of education they had attained. There were 485 (46.3%) mothers who had completed a tertiary qualification; trade certificate, certificate, diploma or bachelor's degree. Results are presented in Table 5.2.3.

Table 5.2.3

Marital Status of primary care givers at 6 weeks and 11 years

Mother's Highest Education	Number	%
Up to secondary	554	52.9
Beyond secondary	485	46.3
Missing	8	.8

5.3 Descriptive analysis – socio-economic

5.3.1 Weekly income

Statistics New Zealand (2011) recorded that in the June quarter of the previous year the median weekly income for females was \$663 and males was \$920. Approximately two-third of the PIF study mothers were earning less than that median salary and only 80 fathers (7.6%) out of 743 fathers recorded an income of over \$1000 per week. Table 5.3.1 shows a detailed breakdown of primary caregiver and their partner's weekly income by income band.

Table 5.3.1*Primary caregiver and partner's weekly income.*

	Weekly Income	Number	%
Primary Caregiver	Up to \$250	238	22.7
	\$251 - \$500	415	39.6
	\$501 - \$1000	266	25.4
	Over \$1000	49	4.7
	Unknown/Missing	79	7.5
Partner	Up to \$250	145	13.8
	\$251 - \$500	217	20.7
	\$501 - \$1000	301	28.7
	Over \$1000	80	7.6
	Unknown/Missing	304	29

5.3.2 Household size

According to Statistics New Zealand (2011) the average size of a New Zealand household was 2.6 people in 2011 and this was expected to decrease to 2.4 people per household by 2031. PIFS results for the same period were not consistent with the national average. PIFS data showed that 568 (85%) children resided in households occupied by more than 5 people and only 155 families were in the two to four people per household band. Results are shown in Table 5.3.2.

Table 5.3.2*Household size for PIF children.*

Household Size	Number	%
2-4	155	14.8
5-7	566	54.1
Greater than 8	2	30.9
Missing	2	.2

5.4 Internalising and externalising descriptive statistics

5.4.1 Internalising and externalising descriptive scores

Valid Child Behaviour Checklist (CBCL) data was collected on 1004 children.

The internalising data set contained scores that ranged from 0 to 30, with some children having the lowest possible score of zero. Zero or lower scores (e.g. one or two behavioural indicators) suggested no or minimal signs of internalising behaviours. The mean of the internalising data set was 6.51 and the median was 5.00, this indicated that most scores are in the lower end of the range. The standard deviation of this data set was 4.75 which was relatively close to a mean of 6.51. The kurtosis value was 1.97 while skewness value was 1.26. Skewness and kurtosis values as well as mean, confidence interval, median and standard deviation values showed that the majority of scores are clustered around the low end of the scale.

The externalising data set contained scores that ranged from 0 to 38, with some children having the lowest possible score of zero. Again, zero or low score (e.g. one or two behavioural indicators) suggested no or minimal signs of externalising behaviours. There were small number of children with scores at the higher end of the range. Children with high-end outlier scores are seen as having an increased likelihood of externalising behaviours. The mean externalising score was 8.5 and the median was 8.0, indicated the majority of scores are in the lower range. The standard deviation was 5.53 and again this is relatively close to the mean. The kurtosis value was 1.99 while the skewness value was 1.07 indicated that the distribution of externalising scores was similar to that of internalising scores.

Examination of quartile range confirmed the distribution of internalising scores with approximately 50% of children having scores that were equal to or less than 5 and nearly 75% of children with scores that were equal to or less than 9. Similar results are shown in the externalising scores with approximately 50% of children

having scores that are equal to or less than 7 and 75% of children having scores equal to or less than 11. There were only 216 children remaining in the upper quartile range for internalising scores and 256 children remaining in the upper quartile range for externalising scores. The analyses of the internalising and externalising child participant scores at the 11 year time point are presented in Table 5.4.1.

Table 5.4.1

Statistical analysis of children’s internalising and externalising scores at 11 years

		Internalising	Externalising
N	Valid	1004	1004
	Missing	43	43
Mean		6.51	8.50
Median		5.00	8.00
Standard Deviation		4.75	5.53
Minimum		0	0
Maximum		30	38

5.4.2 Clinically significant scores

There is no known reference material available that specifically classifies Pacific children in normal, borderline and clinical ranges for internalising and externalising behaviours. Rather than use cut-off points developed for an American sample, it was decided to consider the top 25% of scores as potentially clinically significant for later regression analysis. In the internalising data set, this is scores of nine and above and in the externalising data set this is scores of 12 or above. There were 216 children in the upper quartile range for internalising scores and 256 children in the upper quartile range for externalising scores. Bar graphs in Figure 5.4.1 and Figure 5.4.2 show the distribution of children’s scores.

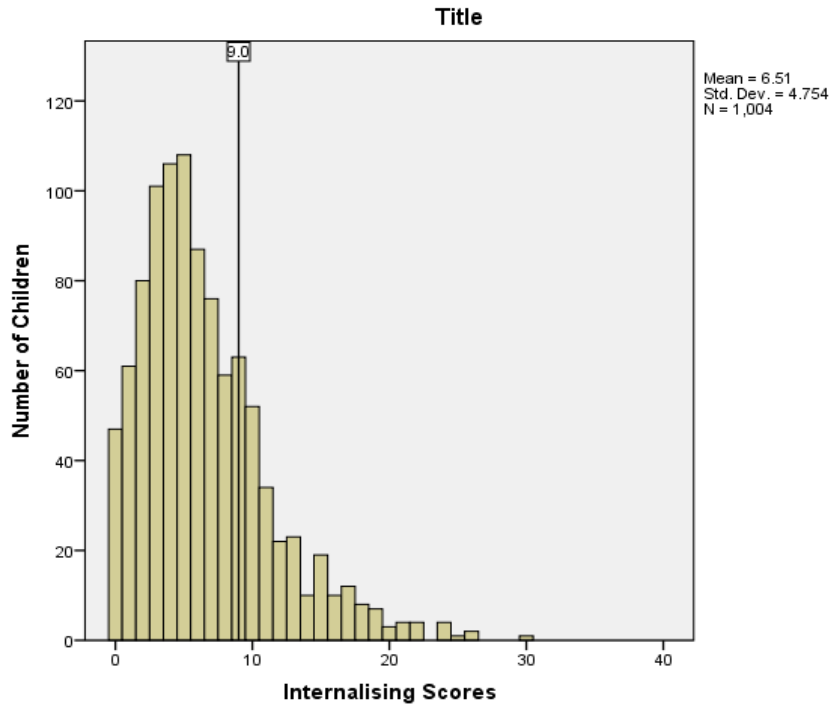


Figure 5.4.1
 Histogram showing the distribution of children's internalising scores and cut-off for the upper 25% of scores.

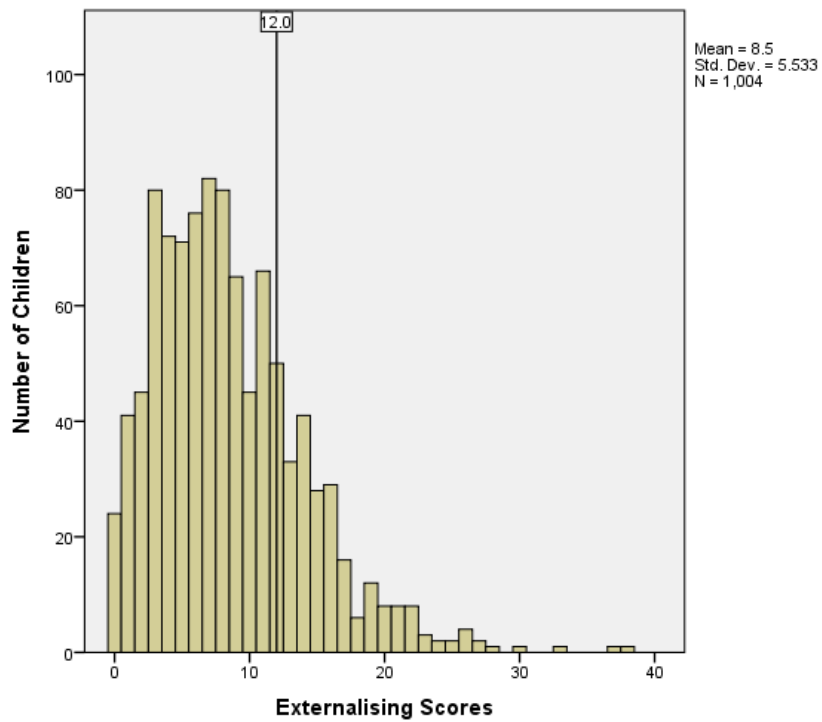


Figure 5.4.2
 Histogram showing the distribution of children's externalising scores and cut-off for upper 25% of scores.

5.4.3 Internalising and externalising scores by gender

The analysis of internalising behaviours by gender showed that the mean score (6.87) for females was slightly higher than the mean score (6.15) for male children, indicated that there was a higher frequency of internalising behaviours for female children. Conversely, the analysis of externalising scores by gender showed that the mean score (9.01) for male children was slightly higher than the mean score (8.01) for female children, indicated that there was a higher frequency of externalising behaviours for male children. Distribution of scores by gender are shown in Figures 5.4.3, 5.4.4 and 5.4.5.

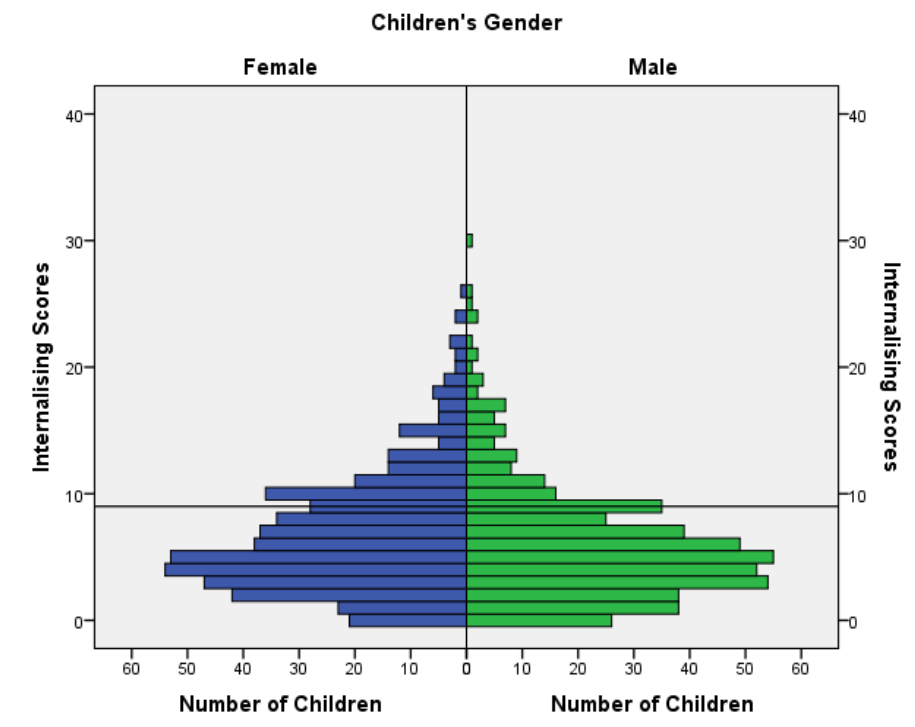


Figure 5.4.3
Comparative histogram showing the distribution of children's internalising scores by gender with cut-off for upper 25% of scores.

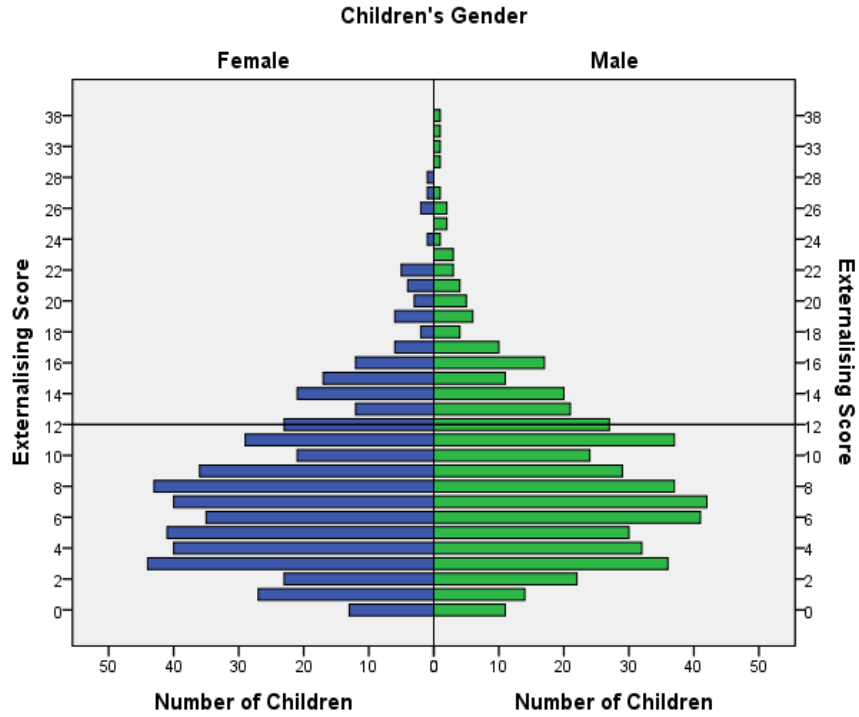


Figure 5.4.4
 Comparative histogram showing the distribution of children's externalising scores by gender with cut-off for upper 25% of scores.

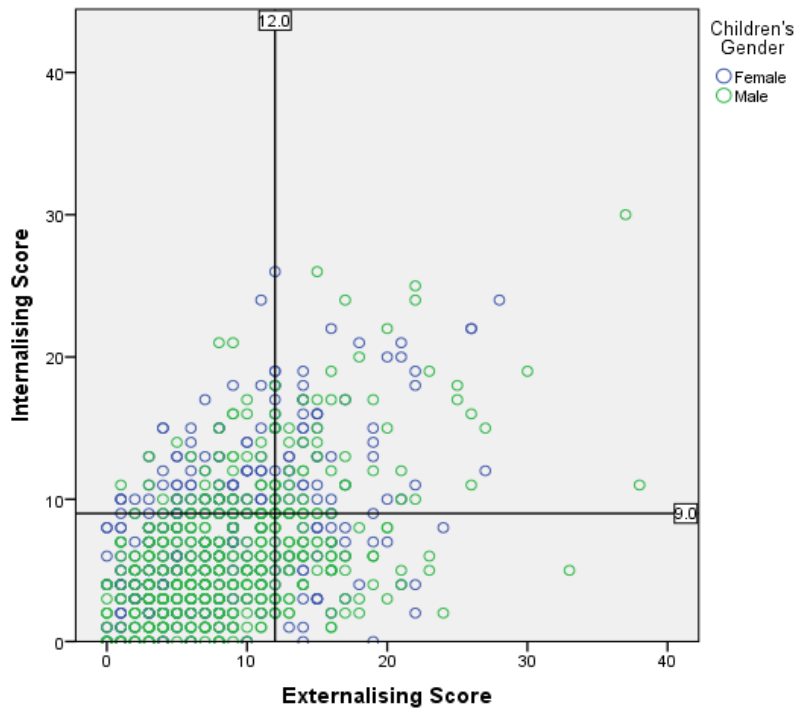


Figure 5.4.5
 Scatter plot showing the distribution of children's internalising and externalising scores by gender with cut-off for upper 25% of scores.

5.4.4 Internalising and externalising scores in regard to bullying

With regard to internalising behaviours, the analysis found that the group of children who were the victim of bullying had a mean score (6.76) which is slightly higher than the mean score (6.16) for children that had not been the victim of bullying. Similar results for internalising behaviours were found when comparing the mean score (7.17) of the children who were the perpetrator of bullying to the mean score (6.13) of the children who had no involvement in bullying. Comparison of means indicate that there were a higher frequency of internalising behaviours for both victims and perpetrators of bullying.

The analysis also showed that there were a higher frequency of externalising behaviours for children that were the perpetrator of bullying (mean= 9.62) than children who had no involvement in bullying (mean = 7.91). Children that had been the victim of bullying (mean= 8.33) also had a higher frequency of externalising behaviours than children that had not been a victim of any bullying (mean=8.09). Again, the comparison of means indicate that there was a higher frequency of externalising behaviours for both victims and perpetrators of bullying. The distribution of scores in relation to bullying are shown in Figures 5.4.6 to 5.4.9.

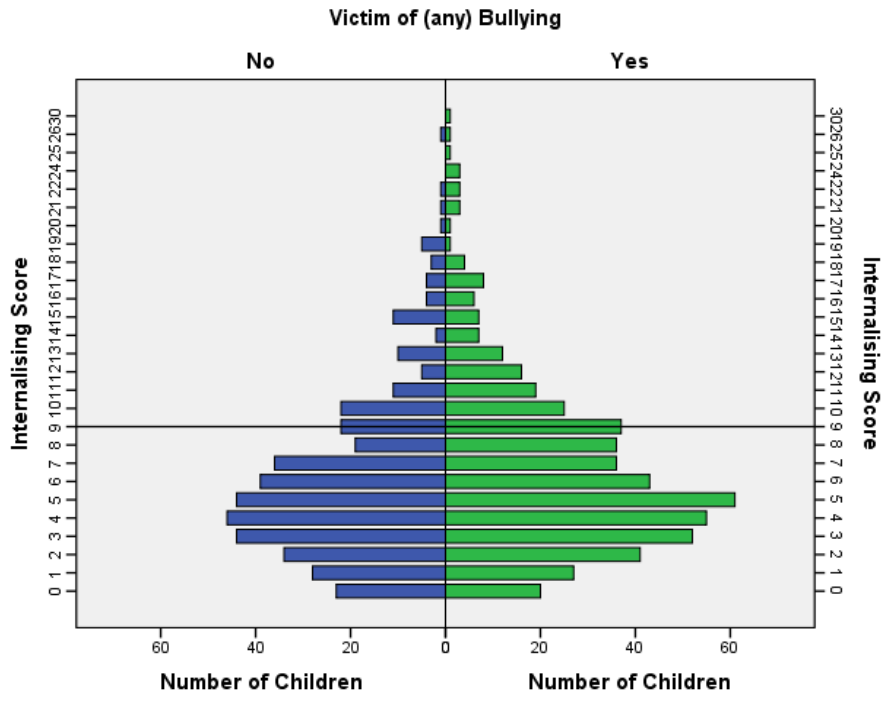


Figure 5.4.6
Comparative histogram showing the distribution of children's internalising scores in relation to whether they had been a victim of bullying.

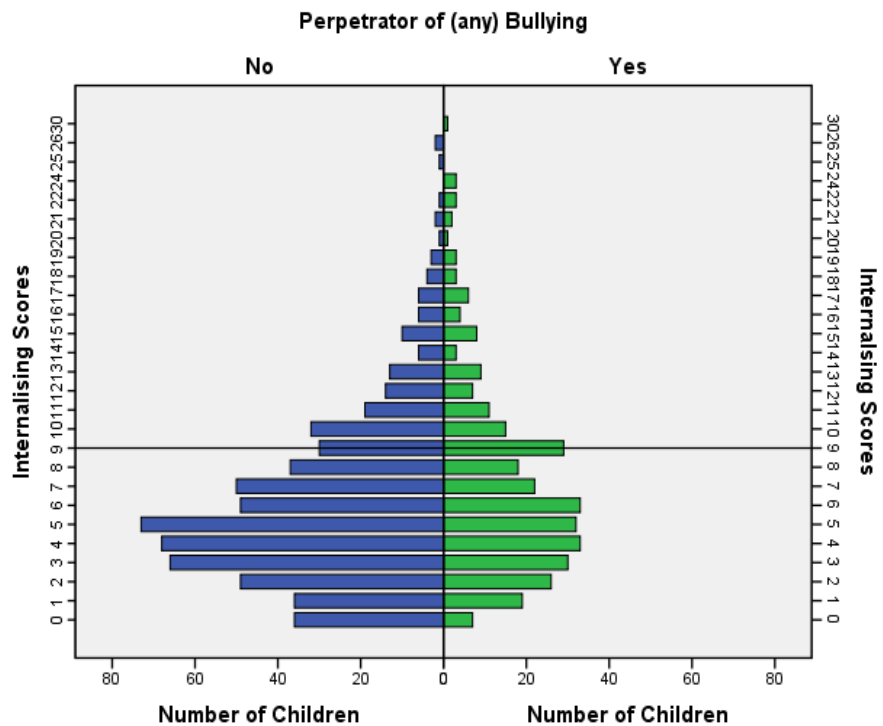


Figure 5.4.7
Comparative histogram showing the distribution of children's internalising scores in relation to whether they had been a perpetrator of bullying.

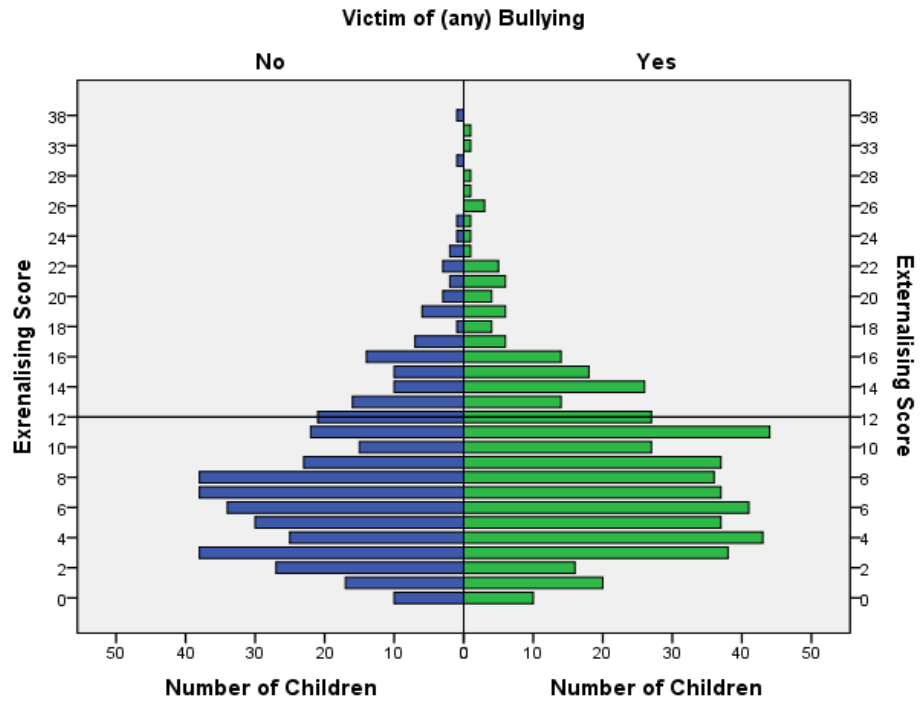


Figure 5.4.8
Comparative histogram showing the distribution of children's externalising scores in relation to whether they had been a victim of bullying.

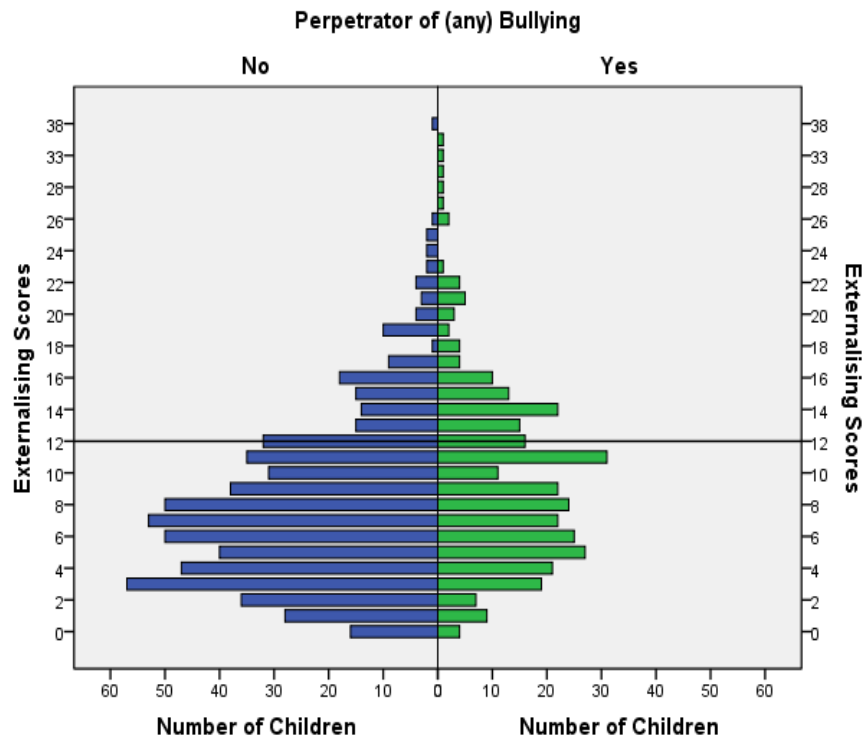


Figure 5.4.9
Comparative histogram showing the distribution of children's externalising scores in relation to whether they had been a perpetrator of bullying.

5.5 Logistic regression – bivariate associations

The analysis identified that there were a number of significant interactions between outcome variables and the potentially explanatory variables.

5.5.1 Child variables - internalising and externalising behaviours

Children's ethnicity and acculturation were not found to have significant associations with internalising or externalising scores with p-values failing to reach the conventional significance level of $p \leq 0.05$. Significant association for internalising behaviours was associated with the female gender ($p < 0.001$ and $OR = 1.68$). For externalising behaviours, it is noted that there is a trend towards statistical significance for male children ($p = 0.07$ and $OR = 1.00$). Children that identified as a perpetrator of bullying ($p > 0.001$ & $OR = 1.92$) are also found to have a strong relationship to externalising scores. Results are shown in the Tables 5.5.1.

Table 5.5.1

Logistic regression analysis of the child, parental and sociodemographic variables and associated odds ratios confidence intervals for the internalising and externalising behaviours.

	N (%)	Internalising Behaviour			Externalising Behaviour		
		n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value
Gender							
Female	508	25.8	1.68 (1.24,2.28)		18.3	.75 (0.55-1.02)	
Male	496	17.1	1.00	0.001	23.0	1.00	0.07
Ethnicity							
Samoan	456	19.5	1.00		18.6	1.00	
Cook Islander	168	20.2	1.05 (0.67,1.63)		26.2	1.55 (1.02, 2.35)	
Niuean	49	20.4	1.06 (0.51,2.20)		16.3	0.85 (0.38,1.88)	
Tongan	229	26.6	1.50 (1.03, 2.17)		19.7	1.07 (0.71,1.60)	
Other	102	21.6	1.13 (0.67, 1.92)	0.31	24.3	1.42 (0.85, 2.36)	0.21
Acculturation							
Assimilationist	421	17.8	1.00		20.2	1.00	
Separationist	291	24.4	1.49 (1.03, 2.15)		24.4	1.28 (0.89, 1.82)	
Integrator	101	26.7	1.68 (1.01, 2.79)		17.8	0.86 (0.49, 1.50)	
Marginal	185	22.2	1.31 (0.86, 2.01)	0.09	17.3	0.83 (0.53, 1.30)	0.23
Bullying							
Victim no	416	19.5	1.00		18.8	1.00	
Victim yes	526	22.4	1.20 (0.87- 1.64)	0.27	21.5	1.19 (0.86, 1.64)	0.30
Perpetrator no	614	19.5	1.00		16.4	1.00	
Perpetrator yes	328	24.1	1.31 (0.95- 1.80)	0.10	27.4	1.92 (1.39, 2.66)	<0.001

The analysis found that there was only one statistically significant result that showed an association between internalising behaviours and the gang questions. Children who had a family member who was part of a gang ($p=0.001$ and $OR=1.55$) was highly correlated to internalising behaviours.

However, there were a number of gang variables that were found to have significant relationships with externalising behaviour. Children who were exposed to or involved in gangs were statistically more likely to exhibit externalising behaviours, as follows; “family members who were part of a gang” ($p=0.001$ and $OR=1.87$), “friends part of a gang” ($p<0.001$ and $OR=2.07$), “wears gang colours or

use gang signs” (p=0.02 and OR=1.92) and gang representation” (p=0.004 and OR=4.04). Results are shown in table 5.5.2.

Table 5.5.2

Logistic regression analysis of the gang variables and associated odd ratios and confidence intervals for the internalising and externalising behaviours.

	N (%)	Internalising Behaviour			Externalising Behaviour		
		n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value
Family members part of a gang							
No	743	19.8	1.00		18.4	1.00	
Yes	175	27.4	1.55 (1.06, 2.27)	0.001	29.7	1.87 (1.28, 2.72)	0.001
Friends part of a gang							
No	766	20.9	1.00		18.3	1.00	
Yes	158	24.1	1.20 (0.80, 1.80)	0.38	30.6	2.07 (1.41,3.03)	<0.001
Wears gang colours or using gang signs							
No	874	21.1	1.00		19.6	1.00	
Yes	69	21.7	1.04 (0.57, 1.89)	0.89	31.9	1.92 (1.13,3.28)	0.02
Gang representation							
No	926	20.8	1.00		19.9	1.00	
Yes	18	38.9	2.42 (0.92,6.32)	0.07	50.0	4.04 (1.58,10.3)	0.004

The analysis of self-perception questions with regard to internalising behaviours only showed results that were trending towards statistical significance “My parents/guardians like me?” (p=0.09 and OR=1.00) and “Other kids want to be my friend?” (p=0.15 and OR=1.53)

The self-perception results in regard to externalising behaviours displayed strong associations for children that answered negatively to the following two questions; “I get on well with my parents” (p=0.04 and OR=1.77) and “A lot of things about me are good” (p=0.05 and OR=1.43). The remaining self- perception variables have p-values >0.05 and are not seen as having a significant relationship to externalising behaviours.

Table 5.5.3

Logistic regression analysis of the children's self- description responses in relations to their physical activities, parental and peer relationships.

	N (%)		Internalising Behaviour			Externalising Behaviour		
	n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value		
I get on with other kids								
No	164	26.2	2.42 (0.92,6.32)	22.6	1.16 (0.77,1.73)			
Yes	785	20.4	1.00	20.1	1.00	0.48		
I enjoy doing school work								
No	150	24.7	1.25 (0.83,1.88)	16.7	0.74 (0.47,1.17)			
Yes	799	20.8	1.00	21.3	1.00	0.20		
My parents/guardians like me								
No	51	11.8	0.47 (0.2, 1.13)	17.6	0.82 (0.39,1.71)			
Yes	898	21.9	1.00	20.7	1.00	0.60		
Other people think I am a good person								
No	285	18.9	0.81 (0.57, 1.15)	24.9	1.46 (1.05,2.04)			
Yes	660	22.4	1.00	18.5	1.00	0.25		
I enjoy sports and games								
No	52	26.9	1.38 (0.73,2.60)	15.4	.690 (0.32,1.49)			
Yes	897	21.1	1.00	20.8	1.00	0.35		
Other kids want to be my friend								
No	232	27.2	1.53 (1.09,2.16)	19.0	0.87 (0.60,1.27)			
Yes	716	19.6	1.00	21.1	1.00	0.49		
I am good at school work								
No	280	22.1	1.06 (0.76,1.49)	21.1	1.05 (0.74,1.47)			
Yes	669	21.1	1.00	20.3	1.00	0.80		
I get along well with my parents								
No	69	20.3	0.93 (0.51,1.71)	30.4	1.77 (1.04,3.04)			
Yes	880	21.5	1.00	19.8	1.00	0.04		
A lots of things about me are good								
No	213	21.1	0.98 (0.67,1.42)	25.4	1.43 (1.00,2.05)			
Yes	736	21.5	1.00	19.2	1.00	0.05		
I am good at sports								
No	135	33.3	2.08 (1.30,3.09)	24.4	1.30 (0.85, 2.0)			
Yes	814	19.4	1.00	19.9	1.00	0.23		

No = Strongly disagree/disagree/ neither agree or disagree and Yes = Agree/Strongly agree

Not achieving academically was not seen as having a statistically significant relationship to internalising behaviours. On the other hand, there were particularly noteworthy associations between externalising behaviours and

children who were assessed by their teachers as not achieving academically. The “very poor/needs improvement” categories gave the following results; evaluation of reading ($p < 0.001$ and $OR = 2.12$), evaluation of written language ($p = 0.001$ and $OR = 1.83$) and evaluation of oral language ($p = 0.004$ and $OR = 1.80$) and evaluation of maths ($p = 0.02$ and $OR = 1.54$). Children who struggled to follow classroom instructions were also found to have a significant association to externalising behaviours ($p = 0.03$ and $OR = 1.69$). Results are shown in Table 5.5.4.

Table 5.5.4

Logistic regression analysis of the teacher assessment variables and associated odd ratios and confidence intervals for the internalising and externalising behaviours.

	N (%)	Internalising Behaviour			Externalising Behaviour		
		n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value
Evaluation of Reading							
V Poor/Needs Imp	214	24.8	1.24 (0.84-1.81)		30.4	2.12 (1.46,3.08)	
Sat/V Good/Excellent	486	21.0	1.00	0.27	17.1	1.00	<.001
Evaluation of Oral Language							
V Poor/Needs Imp	172	21.5	0.95 (0.63,1.45)		29.1	1.80 (1.21,2.68)	
Sat/V Good/Excellent	529	22.3	1.00	0.83	18.5	1.00	0.004
Evaluation of Written Language							
V Poor/Needs Imp	258	22.9	1.08 (0.75,1.57)		27.5	1.83 (1.26,2.64)	
Sat/V Good/Excellent	442	21.5	1.00	0.63	17.2	1.00	0.001
Evaluation of Maths							
V Poor/Needs Imp	239	23.0	1.01 (0.76,1.60)		25.9	1.54 (1.06,2.24)	
Sat/V Good/Excellent	459	21.4	1.00	0.61	18.5	1.00	0.02
Evaluation of following classroom procedures							
V Poor/Needs Imp	95	17.9	0.74 (0.42,1.29)		29.5	1.69 (1.04,2.74)	
Sat/V Good/Excellent	605	22.8	1.00	0.28	19.8	1.00	0.03

5.5.2 Maternal variables - internalising and externalising behaviours

Family stability had some associations with both internalising and externalising behaviours. Children that had a non-partnered mother ($p < 0.12$ and $OR = 1.34$), showed a result trending towards significance for internalising behaviours. There were stronger associations for externalising disorders for children who had de-facto mothers ($p = 0.07$ $OR = 1.45$) or non-partnered mothers ($p = 0.07$ and $OR = 1.43$). The level of a mother's education was not seen as having a significant relationships to either internalising or externalising behaviours.

Table 5.5.5

Logistic regression analysis of the maternal and caregiver responses in relations to their marital status and level of education.

	N (%)	Internalising Behaviour			Externalising Behaviour		
		n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value
Marital Status							
Partnered/ Married	613	21.0	1.00		18.3	1.00	
Partnered/ Defacto	184	17.9	0.82 (0.54, 1.25)		24.5	1.45 (0.98, 2.15)	
Non- partnered	205	26.3	1.34 (0.93, 1.94)	0.12	24.4	1.43 (0.99, 2.11)	0.07
Mother's Education							
Up to sec school	529	21.9	1.00		21.7	1.00	
Beyond sec school	467	20.6	0.92 (0.68, 1.25)	0.60	18.8	0.84 (0.61, 1.14)	0.26

5.5.3 Socio - economic variables – internalising and externalising behaviours

There were no socio – economic variables that had statistically significant associations to internalising behaviours. However, there were a number of variables that indicated social and economic disadvantage that had significant associations with externalising behaviours. Significant associations were as follows; living in a house with five to seven people ($p > 0.01$, $OR = 2.22$ & $CI = 1.29 - 3.82$) and living with eight plus other people ($p > 0.01$, $OR = 2.18$ & $CI = 1.23 - 3.87$),

having a mother who receives an income of \$0 to \$250 ($p=0.03$, OR =1.00) or \$250 to \$500 per week ($p>0.03$, OR =1.17 & CI=0.80-.71) or having a father who received an income of \$0 to \$250 ($p> 0.001$, OR 1.00) or \$250 or \$500 per week ($p> 0.001$, OR = 0.97 & CI = 0.60–1.56). It is additionally noted that there was a somewhat non-linear relationship between income levels and externalising behaviours.

Table 5.5.6

Logistic regression analysis of the socio-economic responses in relations to household size and primary care giver and partner's income.

	N	Internalising Behaviour			Externalising Behaviour		
		(%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value
Household Size							
2-4	148	19.6	1.00		11.5	1.00	
5-7	546	22.3	1.18 (0.75, 1.86)		22.3	2.22 (1.29, 3.82)	
8+	308	21.6	1.10 (0.67, 1.79)	0.75	22.1	2.18 (1.23, 3.87)	0.01
Primary Income Weekly							
\$0 to \$250	238	20.2	1.00		21.8	1.00	
\$250 - \$500	415	23.6	1.22 (0.83, 1.81)		24.6	1.17 (0.80, 1.71)	
\$501 - \$1000	266	18.8	0.92 (0.59, 1.43)		15.4	0.65 (0.41, 1.03)	
Over \$1000	49	22.4	1.15 (0.54, 2.41)		14.3	0.60 (0.25, 1.41)	
Not Reported	36	25.0	1.32 (0.58, 2.99)	0.59	13.9	0.58 (0.21, 1.56)	0.03
Partner Income Weekly							
\$0 to \$250	145	22.8	1.00		26.9	1.00	
\$250 - \$500	217	23.0	1.12 (0.62, 1.68)		26.3	0.97 (0.60, 1.56)	
\$501 - \$1000	301	19.3	0.81 (0.50, 1.31)		13.6	0.43 (0.26, 0.70)	
Over \$1000	80	16.3	0.66 (0.32, 1.34)		17.5	0.58 (0.29, 1.14)	
Not Reported	261	23.8	1.06 (0.65, 1.71)	0.49	21.5	0.74 (0.46, 1.19)	0.002

Note: p-values tested for heterogeneity not trend.

5.6 Logistic regression – multiple variable model

Multiple variable regression was used to refine the group association between the independent child, maternal and socio-economic variables with p-values ≤ 0.2 and the internalising and externalising behaviours of interest.

5.6.1 Internalising behaviours

Group associations for internalising behaviours, were established by entering the following independent child variables into the equation; gender, family members part of a gang, gang representation, “I get on with other kids”, “my parents/guardians like me”, “other kids want to be my friend” and “I am good at sport”.

The analysis only removed one variable, “gang representation.” Variables that had significant cumulative associations to internalising behaviours were as follows; female gender (p=0.0001, OR=1.91),) answering yes to the question “my parents/guardians like me” (p=0.03, OR=1.00), answering no to the question “other kids want me to be their friend” (p=0.02, OR=1.52), answering no to the question “I am good at sports” (p=0.004, OR=1.85) and having “family members that are part of a gang” (p=0.02, OR=1.59).

Additionally, there was noteworthy modification of odds ratio for some of the variables in the multiple variable model when compared to the earlier bivariate logistic analysis. With regard to internalising behaviours, the odds ratio for gender moved from 1.68 to 1.91, “my parents/guardian like me” moved from 0.47 to 0.36 and “I am good at sports” moved from 2.08 to 1.85. This demonstrates the importance of the multiple variable model to address confounding between the variables of interest. Final results are detailed in Table 5.6.1.

Table 5.6.1*Multiple variable model – internalising behaviours*

	Internalising Behaviour	
	OR (95%CI)	p-value
Gender		
Female	1.91 (1.37, 2.67)	0.0001
Male	1.00	
My parents/guardians like me		
No	0.36 (0.14, 0.93)	0.03
Yes	1.00	
Other kids want me to be their friend		
No	1.52 (1.06, 2.20)	0.02
Yes	1.00	
I am good at sports		
No	1.85 (1.21, 2.82)	0.004
Yes	1.00	
Family members are part of a gang		
No	1.00	0.02
Yes	1.59 (1.07, 2.34)	

5.6.2 Externalising behaviours

Externalising behaviours group associations were examined twice, without teacher assessments then again with teacher assessment. To establish initial group associations for externalising behaviours, the following independent child, maternal and socio-economic variables were entered into the equation; perpetrator of bullying, “family members part of a gang”, “friends part of a gang”, “wears gang colours or uses gang signs”, “gang representation”, “I get on with my parents”, “a lot of things about me are good”, marital status, household size and primary income weekly and partner income weekly.

The second analysis evaluation included teacher assessments; evaluation of reading, evaluation of oral language, evaluation of written language, evaluation of maths and evaluation of following classroom instructions. Variables that had a significant collective association to externalising behaviours were as follows; having a mother who was in a de-facto relationship or non-partnered, living with 5-7 or 8+ people in a household, having a partner income that was in the low

bracket less than \$250.00 per week and having “family members who are part of a gang”. The second analysis found similar results to the first despite the teacher assessment only being completed on 700 children.

Again, there was also modification of odds ratio results for externalising behaviours in the variables in the multi-variate model when compared to the previous bivariate analysis. In particular, the odds ratio for being non-partnered moved from 1.34 to 3.28, odds ratio for 5-7 people in a household changed from 1.18 to 2.83 and for 8+ people changed from 1.10 to 2.74. Additionally the odds ratio for gender moved from 1.68 to 1.91, “my parents/guardian like me” moved from 0.47 to 0.36 and “I am good at sports” moved from 2.08 to 1.85. Further modification odds ratio results in both upwards and downwards directions was seen in the second analysis which included the teacher’s assessment. It is difficult to conclude whether this further modification was due to decreased numbers in the subset or the teacher’s variable itself. Final results are detailed in Table 5.6.2.

Table 5.6.2*Multiple variable model – externalising behaviours*

	Externalising (n=913)		Externalising including teacher assessments (n=669)	
	OR (95%CI)	p-value	OR (95%CI)	p-value
Marital Status				
Partner - Married	1.00		1.00	
Partnered – Defacto	1.50 (0.98, 2.32)		1.88 (1.14, 3.11)	
Non-partnered	3.28 (1.54, 7.00)	0.005	2.81 (1.18, 6.68)	0.01
Household size				
2-4	1.00		1.00	
5-7	2.83 (1.57, 5.09)		2.69 (1.40, 5.18)	
8+	2.74 (1.46, 5.14)	0.002	2.33 (1.15, 4.74)	0.01
Partner Income				
\$0-\$250	1.00		1.00	
\$250-\$500	0.87 (0.52, 1.46)		0.88 (0.49, 1.59)	
\$401-\$1000	0.40 (0.24, 0.68)		0.38 (0.21, 0.70)	
>\$1000	0.68 (0.33, 1.39)		0.48 (0.19, 1.20)	
Not Reported	0.31 (0.14, 0.68)	0.0007	0.27 (0.11, 0.67)	0.001
Family Members part of a gang				
No	1.00		1.00	
Yes	1.54 (1.03, 2.30)	0.04	1.77 (1.12, 2.79)	0.01
Bullying				
Perpetrator No	1.00		1.00	
Perpetrator Yes	1.78 (1.26, 2.51)	0.001	1.54 (0.02, 2.30)	0.04
Evaluation of Reading				
V Poor/Needs Imp	-		1.87 (1.25, 2.79)	
Sat./V	-	-	1.00	0.002
Good/Excellent				

Chapter 6 – Discussion

This chapter discusses the research findings and points of interest that arose from this study. The chapter begins with a discussion about the key findings drawn from the multi-variate model; the social factors that could theoretically be associated with internalising and externalising behaviours in Pacific Island children at age 11 years.

This is followed by a further conversation about the distribution of internalising and externalising behaviours in the cohort at 11 years and the child, parents and caregivers or socio-economic characteristics that were seen individually to influence the development of internalising or externalising behaviours at age 11 years. This chapter concludes with an overview of the strength and limitations of the current study.

6.1 Group associations

This study concluded that there were specific groupings of factors, aspects of the family system, individual characteristics of the child, and socio-economic factors that are cumulatively associated with internalising and externalising behaviours in Pacific Island children at 11 years.

Most of the findings pertaining to internalising behaviours are congruent with the literature. In particular, children that display internalising behaviours are more likely to be female. These children, despite having good relationships with their parents or guardians, are likely to have difficulty forming friendships with other children and are not confident in sporting activities and have family members who were part of a gang. A child that has low self-concept that is spending more time with their parents, is doing the opposite to most of their peers who are increasingly spending more time with their friends outside the orbit of parental control (Eccles, 1999). The association between children who have family

members that are part of a gang and internalising behaviours, is a new and interesting finding. It suggests that children at 11 years are very aware and may suffer stress and anxiety due to family member's involvement in gang activities.

Additionally these findings should be considered in relation to the possible protective factors; conditions or circumstances that provide positive adaptation despite the presence of the risk factor. The ability for children to build and maintain good quality friendships and develop a satisfactory level of performance in sports and build self-confidence are seen as having positive prognostic implications and reducing the likelihood of internalising behaviours developing.

With regard to externalising behaviours findings replicated results from other studies confirming that multiple socio-economic disadvantaging factors are a significant risk (Fergusson & Horwood, 2001 and Paterson et al, 2013). In particular, children with a mother who was in a de-facto relationship or was non-partnered, children that were living with 5-7 or 8+ people in a household, children with a father in the lowest income ranges (less than \$250.00 per week) and children with family members who are part of a gang were more likely to experience externalising behaviours. Interestingly, being of male gender was not found to be relevant to group associations for externalising behaviours. The second analysis which included teacher assessments concluded that poor reading was also a significant factor to the above group associations.

It is widely accepted that children living in poorer families will have difficulty accessing resources needed to foster healthy development (Solari & Mare, 2012). It is logical to assume that the PIF study families are similar to other families who have low levels of income and obtaining work to make ends meet is a priority. Demands of employment for many means lack of time for children which is likely to impact on quality parent-child time and supervision. (Paratore, Melzi, & Krol-Sinclair, 1999). In large households, children will find a lack of space impacts on study and privacy. Increasing the level of academic achievement is one of the most successful routes to a higher income (Cancian & Danziger, 2009). Therefore, it is deemed essential that Pacific Island families have access to education in order to improve skills and competencies and therefore personal circumstances.

6.2 Children

This study, through the evaluation of quantitative data, provides a robust description of the current cohort and their family relationships and socio-economic situation. The examination of information from bivariate associations provides some insight into children's potential development trajectories.

At the 11 year time point there was 1047 remaining child participants, of those children there were 256 children in the upper quartile for externalising behaviours and 216 children in the upper quartile for internalising behaviours. The majority of scores for both internalising and externalising behaviour were clustered around the low end of the scale and there was only a small number of children with scores at the higher end of the range. Therefore the analysis suggested the majority of children show no or minimal signs of externalising or internalising behaviours, and there is only a small number of children with extremely high scores that would require psychological support. However, those children with scores in the high end of the upper quartiles range are potentially at risk of developing problems in the future.

With regard to gender, the findings from this study were somewhat consistent with the literature review. The mean score for externalising behaviours was higher for males and conversely the mean score for internalising behaviours were higher for female children. The bivariate analysis also showed a significant association indicating a higher frequency of internalising behaviours for female children but only showed an indicative result for male children and externalising behaviours.

The development trajectories for PIF study children continues to show significant time varying effects in relation to gender. Previous research by Paterson, Taylor, Schluter and Iustini (2012) on the PIF Study cohort reported that female children were more likely to have externalising behaviours at two years, but found no differences with male children at four years and were less likely to have

externalising behaviours at six years. This study found that the downward trend continued, with girls at eleven years continuing to have less externalising behaviours. The reverse trend is seen for internalising behaviours. Paterson, Taylor, Schluter and Iustini (2012) reported that at six years' girls had significantly more internalising behaviours but found no differences in the gender results at earlier ages. This study's results were similar to outcomes at six years with eleven-year-old girls exhibiting more internalising behaviours when compared to boys. A similar development pathway also has been previously documented by Bongers et al. (2004) in a longitudinal birth cohort study in Holland.

The PIF Study is widely recognised as having an ethnic composition of the cohort and is considered broadly representative of the Pacific Island population in New Zealand. As observed at previous time points a child's ethnicity was not found to demonstrate statistical significance in relation to child behaviour problems. However, in terms of acculturation, it is particularly concerning that 185 (18.5 %) of participating children identified as marginalised from both their original Pacific Island culture as well as the wider New Zealand culture. Although acculturation status was only found to have a trending result for internalising behaviours, this does not rule out the possibility that these marginalised children suffer stress as proposed by Berry (1998). If there is no change in status and stress is ongoing then internalising behaviours may become more prevalent in the future.

The causes of marginalisation are unclear, are likely to be multifaceted and further research into acculturation experiences of Pacific Island children needs to be undertaken. There are a number of key questions that need to be answered such as; Is an adaptation experience peculiar to the South Auckland region? Are Pacific children experiencing similar phenomena in other geographical areas? Do parents, caregivers and other close family member's acculturation adaptation influence their children's status?

At eleven years it was found that gang membership was very low with only 14 (3%) boys and 4 (1%) girls disclosing they were a member of a gang. However,

other responses are more concerning with 100 (22%) boys and 76 (16%) girls stating they had a family member who was part of a gang and 94% (21) boys and 64 (14%) girls stating they had friends that were part of a gang. This level of contact with gang members is likely to increase the potential for children to be recruited into gangs and become involved in gang activities in the future. The increased positive response of children stating they wore gang colours or patches supports this proposition. Additionally, it is suggested that antisocial activities including violent crime and drug use are somewhat normalised through such vicarious contact.

Logistic regression analysis indicated strong relationships for some of the gang questions. Having family members that were part of a gang was highly correlated to both internalising and externalising behaviours but having friends that were part of a gang was only linked to externalising behaviours. Most children at eleven years are quite self-aware and conscious about the activities of others as well as how others perceive them. It is reasonable to suggest that children with family members who are part of a gang will suffer stress and anxiety because of the gang related activities of close family members. The relationship to externalising behaviours is potentially interlinked with other variables. It is suggested that children with externalising behaviours may have trouble conforming and that gang membership provides a venue that behaviours outside the norm are accepted. Tupuola (2004) sees gang membership as attractive for marginalised youth as it provides an alternative sense of belonging and identity. Again, further research is recommended to provide as much insight as possible to understand why Pacific children might be attracted to gang membership.

This study also found that there is a relatively high percentage of children who had been involved in bullying, a third as a perpetrator and a half as a victim with some children identifying as being both a victim and perpetrator. Interestingly, findings indicated that there was a higher frequency of internalising and externalising behaviours for both victims and perpetrators of bullying. The effects of bullying on victims is accepted and well documented by numerous sources. It

is universally accepted that bullying can cause damage to victims; affecting a child's self-esteem, ability to trust others and interact in new social situations and may leave the victim with feelings of anger and resentment. Additionally, in the longer term victims of bullying may develop clinical disorders such as depression. Positive self-perception and achievement at school including the ability to develop and maintain good peer relationships can mitigate the effects of bullying and the development of internalising behaviours (Paterson, Iustini, & Taylor, 2014).

A child's self-perception is influenced by many factors including the age, gender and past experiences. At eleven years the onset of puberty and associated changes in both cognitive and emotional development have an effect on self-concept. The actual age that children will commence puberty will vary among children but in general girls will commence puberty between 10 and 14 years and boys commence puberty between 12 and 16 years. Results from the 2002 New Zealand National Child Nutrition survey found that 29% of Pacific girls reported having reached menarche at age 11 years. However, despite a significant percentage of girls having commenced of puberty there is little or no negative effect on girl's self-concept, with girls evaluating themselves higher than boys in all domains except sport. Paterson, Iustini & Taylor (2014) also found that the onset of puberty at nine years had no effect on depressive behaviours.

Early adolescence can be a time that child-parent relationships are strained with children wanting increased autonomy and decreased parental supervision (Eccles, 1999). It is encouraging to see that the large majority of children in this study described their relationship with their parents positively. Previous researchers have documented the benefits of positive relationships with their parents and major caregivers (Cooley, Woljciak, Farineau & Mulli, 2015). Conversely, those children who answered negatively to the following two questions "I get on well with my parents" and "a lot of things about me are good" were seen as more likely to have externalising behaviours. Early adolescence is also a time when children become more concerned about what other people think about them (Eccles, 1999)

and this was reflected in a lower level of positive responses to the question “other people think I am a good person.”

The teacher assessment provided further insight into children’s academic achievement at school. Teacher assessments showed that female children were out-performing males academically across all categories with the exception of maths. Overall assessments showed that between 50 to 60% of children were ranked as satisfactory or very good in relation to reading, oral and written language and maths but that leaves 40% of children not achieving to the required level. The study found that there was significant associations with children who are not achieving academically or who have difficulty following classroom instructions and the frequency of externalising behaviours but there was no statistically significant relationships to internalising behaviours. The Education Review Office (2013) has stated that Pacific students have low levels of achievement at lower decile schools, with significant numbers of students failing to achieve NCEA level 1. The majority of schools in the Mangere- Otahuhu and Otara Papatoetoe area are classified by the Ministry of Education (n.d) as either decile one or two. The Education Review Office (2013) also indicated that socio – economic disadvantages such as drug use and welfare dependency in families was a contributing factor in Pacific Island’s children failure to achieve at school. Managing these educational disparities and improving outcomes for Pacific children in South Auckland is fundamental to obtaining good literacy and numeracy skills which are the basis for achievement at secondary school, tertiary studies and subsequent employment.

6.3 Parents and caregivers

At 11 years most children continued to live with their birth mother, the majority of mothers were either legally married or in a de-facto relationship. However, there was a noteworthy increase in children that resided with extended family when compared to the six-week time point. Analysis of data also showed that there also was some movement of mothers from the de-facto status to either

legally married or single status. Family stability was found to have some associations with both internalising and externalising behaviours. In particular, children with de-facto mothers or non-partnered mothers were more likely to demonstrate externalising behaviours and having a non-partnered mother, showed a result that was trending towards significance for internalising behaviours. Previous research has confirmed the reduced financial circumstances for single women, finding that the majority of children living in single parent families are poorer than those living with two parents, and in most instances gender disparities in employment allow single men to earn more than single women. (Dwyer, 2015). Education levels of PIFS mothers remains lower than the New Zealand average with 485 (46.7%) of mothers having completed a tertiary qualification i.e. trade certificate, certificate, diploma or bachelor's degree. However, in this study the level of a mother's education was not found as having a significant relationships with either internalising or externalising behaviours.

6.4 Socio-economic

Analysis of the data indicates that the majority of children in the PIF Study live in families with sub-optimal socio economic circumstances. Two thirds of PIF mothers and the majority of their partners were receiving an average weekly income that was less than median weekly income recorded in 2011. This study found that externalising behaviours were only associated with children living in large households and children with parents receiving low levels of income. However, it is noted that the level of significance varies between the income brackets in a non-linear curve. The lowest income streams have higher scores due to deprivation but the middle income earners are also seen as disadvantaged because they are subject to higher levels of taxation and have reduced or no access to benefits that are available to the lowest income earners (Carroll, Casswell, Huakau, Howden-Chapman & Perry, 2011). Poverty drives families to share accommodation with others to reduce rental expenditure. Low income levels are considered the primary reason for 85% of children in the PIFS to live in

large households with more than five people and 30.9% of children live in households with more than eight persons. Multiple people sharing a household results in overcrowding and people living in unsuitable accommodation such as garages and sheds. The inability to keep up to date with financial commitments such as rent means that many families may have to move frequently thus the continuity of children's schooling is potentially affected.

6.5 Strengths and limitations

This study utilises data from the PIF Study. A key strength of the PIF Study is the longitudinal multi-disciplinary design that follows a birth cohort of 1376 Pacific babies and their families. The data from the Pacific Island Families Study are considered robust and not limited by sample attrition or differential loss of ethnic subgroups with 1047 participants remaining at the 11 year time point that the Pacific Island Families cohort is still broadly representative of the Pacific population in New Zealand. It is suggested that the extensive consultation and involvement with the representatives of the Pacific Island Community, the Pacific Island Advisory Board and other stakeholders regarding the design and development have greatly assisted retention rates.

Another strength of the PIF study is the cultural sensitivity of the data collection methods and procedures. All field researchers who visit and interview participants, are fluent in English and a Pacific Island language to ensure appropriate and respectful interactions and this allows participants to be interviewed in their own language if they wish. It is additionally acknowledged that modifications have been made to the design of test instruments to increase relevance to the New Zealand context however these changes make direct comparison to other populations more difficult.

The PIF study uses multiple informants' reports to assess and examine children's behaviour. Information for this research has been obtained from participant, parental and teacher interviews which can be seen as both a strength and

limitation. Data collected from different informant groups can often disagree about the perceived level of a behaviour. For example, Sargisson, Stanley and Hayward (2016) refer to teacher ratings being lower than parent ratings and child's self-scoring and additionally they note a gender bias with boys behaviours rated lower than girls. Additionally, the analysis of data from multi-disciplinary questionnaires does not allow the opportunity to drill down into a particular child's circumstances.

This study utilised a cross-sectional design. A cross sectional analysis was selected, as it was suitable for exploring the relationship between exposure to particular social factors and the prevalence of behaviours in the PIF cohort at 11 years

(Domholdt, 2005). The main limitation of this approach is that only associations can be identified at the 11 year time point and causal links are not able to be isolated. The literature review for this study utilised a systematic search of electronic online health databases as well as hand searching for relevant articles and reports. This search revealed that with the exception of previous PIF study research there is paucity of longitudinal research or robust cross-sectional research on Pacific Island children. This limits the ability to compare the current findings to identical population group. However, this study does make reference to and draw comparison from previous PIF study findings and the experiences of ethnic minorities in overseas communities.

Chapter 7 – Conclusions and recommendations

The following chapter presents the conclusions drawn from the results and discussion. In addition, recommendations based on the findings of this study are also presented below.

7.1 Conclusions

Findings from this study indicate that the majority of children show no or minimal signs of internalising or externalising behaviors. However, the descriptive analysis of the children and their families highlights a number of areas of concern. In particular the high number of children that identify as either culturally marginalised, being involved in bullying, or exposed to gang members. The teacher assessment indicates a high number of children that are not achieving to the expected academic level at school and with many families receiving less than the average weekly income and living in sub-optimal housing.

Analysis showed that there was individual as well as specific combinations of factors that had greater significance on both internalising and externalising behaviours. The study's findings indicated that children had an increased risk of internalising behaviours if the following combination of social factors were present; being female, having good relationships with their parents but having difficulty in forming good relationships with other children, not consider themselves as being good at sport as well as having family members that are part of a gang.

Social and economic disadvantages increased the likelihood of externalising behaviours in children. There was an increased risk of externalising behaviours for children with mothers in less stable relationships, low family income and five plus people residing in a household as well as having family members that are part of a gang. Further analysis that included teacher assessments indicated that poor reading was also a significant factor associated with behavioural outcomes.

7.2 Recommendations

It is suggested that reducing the influence of variables that have been identified in this thesis as risk factors and enhancing the influence of variables that provide a protective factor could assist in improving the well-being of Pacific Island children. For children with internalising tendencies that is seen as developing social support networks and undertaking programmes that build self-concept. Improving social skills, esteem and positive parental or caregiver relationships would provide children with additional resilience and robust peer support to cope with stressful situations. Similarly, school programmes that enhance academic achievement especially in the reading are seen as assisting in the prevention of externalising behaviours. Positive peer relationships, affirmative mentoring as well as increased engagement and success at school is seen as potentially as mediating the effect of anti-social related gang activities.

The sub-optimal socio economic circumstances of many Pacific Island families has been clearly identified as a risk factor for some children developing externalising behaviours. The findings from this study provide positive affirmation for government policy initiatives that focus on addressing health and social disparities. Improving the qualifications and the skills of parents and caregivers is seen as fundamental to them being able to obtain work with decent wages, which in turn will result in more stability and a higher standard of living and better housing options.

In addition to tracking development trajectories of children that have been identified as 'at risk', there are other results which are viewed as requiring additional investigation using both quantitative and qualitative methodologies. It is seen as particularly important to understand the causes and longer term outcomes of children who have identified themselves as culturally marginalised, children that have been exposed to gangs through friends or family members as well as those children that have identified as being perpetrators of bullying. It is also recommended that future research is undertaken to examine the behavioural

patterns of Pacific children as they move towards late adolescence in order to clarify how child, parental and caregiver characteristics and socio-economic factors contribute to the successful negotiation of this important phase of life.

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