

TITLE: THE RELATIONSHIP BETWEEN PACIFIC FATHER INVOLVEMENT AND
CHILD BEHAVIOUR OUTCOMES: FINDINGS FROM THE PACIFIC ISLANDS
FAMILIES STUDY.

Running title: Pacific father involvement and child behaviour outcomes

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ABSTRACT

Background: Fathering and father involvement is critical to the formation, stability, and wellbeing of children and families in society. However, the contemporary nature of fathering and families is changing, especially for emigrant minority populations. Approximately 7% of people in New Zealand are of Pacific descent. While recognised, the importance and impact of the role of fathers has received little empirical attention among this population. This paper examines the relationship between father involvement and their child's behaviour outcomes amongst a birth cohort of Pacific children and fathers in New Zealand.

Methods: A birth cohort was established in 2000 from births at Middlemore Hospital in South Auckland where at least one parent was identified as being of Pacific ethnicity and a New Zealand permanent resident. This included 1376 mothers, 825 fathers, and 1398 children at baseline. At the 6-years measurement wave, father involvement was measured using the Inventory of Father Involvement (IFI), and child behaviour measured using the Child Behaviour Check-list (CBCL). Internalising and externalising behaviour was related to father involvement in crude and adjusted logistic regression and generalised estimating equation models.

Results: 571 Pacific fathers participated at the 6-years measurement wave; most of Samoan (42.9%) or Tongan (33.5%) ethnic identification. Overall, 190 (32.1%) children exhibited clinical or board-line internalising and externalising behaviour. Self-reported father involvement was generally high, but lower involvement was significantly related to increased odds of internalising (adjusted odds ratio [aOR] approximately 1.9, $p < 0.001$) and externalising (aOR approximately 4.0, $p < 0.001$) behaviour.

Conclusion: Father involvement was significantly associated with child behaviour in Pacific families within New Zealand. Strategies that promote and enable increased father involvement may reduce negative child outcomes; common to a disproportion of Pacific families.

Keywords: Fathers, Involvement, Child behaviour, CBCL, Pacific health

The importance of research on fathers and fathering behaviour has been recognized by eminent international bodies, such as the World Health Organization (WHO) (2007) and the United Nations Secretariat (2011), as fundamental and critical to impacting on the formation, stability and overall wellbeing of families. These international bodies propose that a deeper understanding needs to develop of issues regarding fathering roles and family support structures in promoting better quality of life for children and families.

Within New Zealand (NZ), there has been relatively scant population health research into fathers and fathering behaviour; although this paucity has been partially addressed by nationwide studies undertaken by the Ministry of Health (1998, 2008a), and the Families Commission (2007, 2008a). These studies conclude that NZ families are becoming less cohesive and emphasize a need for fathers to have more direct involvement and stronger relationships with their children. Moreover, the findings recognise that the essential role of fathers has for too long been overlooked. This may be because in most post-war modern societies, women have historically been seen as the main caregivers (Wall & Arnold, 2007), and consequently, services, support, and research have largely been directed at mothers.

Pacific people comprise approximately 7.4% of the New Zealand population, and are over-represented in many adverse social, health, and economic statistics relating to unemployment, housing, crime, income, education and nutrition (Alcohol Advisory Council of New Zealand, 2007; Finau, 1999; Ministry of Health, 2008a, 2008b; Statistics New Zealand, 2006). Such statistics have significant consequences for Pacific families given that socioeconomic disadvantage has been consistently linked with negative health outcomes (Callister & Didham, 2008). In response to this, Pacific men's health and particularly the health of Pacific fathers is an issue which in recent years has become increasingly important for health

researchers and policy makers to consider (Families Commission, 2008b; Health Research Council, 2006, 2007). Developing an understanding of the influence which the health and involvement of fathers can engender regarding the positive development of their children, is also an increasingly important and emerging area of research.

Father involvement

Several factors have contributed to an increased interest in father involvement and fatherhood, including changing societal conceptions of parental roles, increased maternal employment, shifts in the demographic profile of modern families, policy debates over the well-being of children, and a growing body of literature outlining the impact of father involvement on child development (Lamb, 2004). For example, a number of studies have demonstrated that healthy and involved fathers can lead to positive cognitive development, social development, and physical health outcomes for both their children and families (Sarkadi, Kristiansson, Oberklaid, & Bremberg, 2008; Teitler, 2001).

Early conceptualizations of father involvement such as the model proposed by Lamb et al. (1987) posit father involvement as consisting of three distinct concepts: engagement, accessibility, and responsibility. Instead, Hawkins and Palkovitz (1999) argue that father involvement is a multidimensional construct that includes affective, cognitive, and ethical components as well as the observable behavioural components proposed by Lamb et al. (1987). In recognition of this multidimensional nature of father involvement, more recent instruments such as the Inventory of Father Involvement (IFI) scale derived by Hawkins and colleagues (2002), have attempted to capture these complexities.

Pacific father involvement

The over-representation of Pacific children with poor health and social outcomes alongside the lack of understanding concerning how Pacific

fathering or father involvement may alleviate these issues, advocates for further research in this area. While Marshall (2005) highlights a lack of empirical studies concerning parenting attitudes, practices, and styles among different cultural groups in NZ, contemporary research from Tautolo (2011) on Pacific fatherhood underlines the importance of father involvement in facilitating positive outcomes for Samoan and Cook Islands children. Moreover, focus-group research by Abel et al. (2001) suggest that Pacific fathers play an important support role during the antenatal period, but took more of a background role compared to female relatives postpartum.

Child behaviour

Father involvement can significantly impact behavioural problems amongst children (Javo, Ronning, Heyerdahl, & Rudmin, 2004). Understanding the risk factors associated with early child behaviour problems is a critical area of empirical enquiry, both in its own right, and as a prerequisite for the development of effective preventions to improve health in children and adults (Robinson et al., 2008).

Few epidemiological studies have focused on the prevalence and correlates of behavioural problems in early childhood (Bordin et al., 2009; Campbell, 1995; Erol, Sinsek, Oner, & Munir, 2005). There is considerable variability of instrumentation and case definition but there is agreement that approximately 10–15% of preschool children show mild to moderate problems (Barkman & Schulte-Markwort, 2005). Within the Pacific Islands Families (PIF) study, a birth cohort of Pacific infants born in South Auckland, the prevalence of total problems within the clinical range identified by the CBCL at two years of age was relatively high at 14.2% (Paterson, Carter, Gao, & Perese, 2007).

Using standardized measures of child behaviour, and father involvement, this paper will examine the relationship between father involvement and

child behaviour outcomes amongst a longitudinal cohort of Pacific fathers and their children at 6-years of age. Additionally, important mediating variables for father involvement and child behaviour outcomes will also be examined. Despite the longitudinal nature of the PIF study, only data from the 6-years measurement wave was utilised for this study. This was the first measurement wave where father involvement data was first collected, and thus the earliest point at which an association between father involvement and child behaviour within the PIF cohort could be modelled. Nevertheless, research has highlighted this 6-year age group as an ideal point to examine father and child interactions as they have usually begun attending school, and father involvement during this age has previously shown a more profound effect on child functioning (Dubowitz et al., 2001).

METHODS

Participants

This study utilizes data from participant fathers and their children at the 6-years measurement of the multi-domain multi-discipline PIF study. This study follows a cohort of Pacific infants born at Middlemore Hospital, South Auckland, between 15 March and 17 December 2000. Detailed information about the cohort, and its recruitment and retention procedures is described elsewhere (Paterson et al., 2008; Paterson et al., 2006; Sundborn et al., 2011). In brief, all potential participants were selected from live births where at least one parent was identified as being of Pacific Islands ethnicity, and a New Zealand permanent resident. Information about the study was provided to all potential participants and consent was sought to make a home visit.

Procedure

Approximately six-weeks after infants' births, female interviewers of Pacific Islands ethnicity who were fluent in English and a Pacific Islands language visited mothers in their homes. Once eligibility was confirmed

and informed written consent obtained, mothers participated in interviews of approximately 90 minutes concerning family functioning and the health and development of the child. At specific time-points postpartum, maternal participants were re-contacted and revisited by a female Pacific interviewer. Again, written consent was obtained before the interview was conducted. At the time of the 6-years postpartum interviews, mothers were asked to give permission for a male Pacific interviewer to contact and interview the father of the child. If permission and paternal contact details were obtained, then a male Pacific interviewer contacted the father to discuss participation in the study. Once informed written consent was obtained from the father, the interview was conducted.

Measures

Father Involvement. Responses from the IFI measurement scale developed by Hawkins et al. (2002) were used to analyse father involvement within this study. The original 35-item IFI questionnaire was designed to provide a reliable and valid self-report instrument that captures the breadth and richness of father involvement, yet is short enough for inclusion in large-scale surveys of broader family issues. The IFI measure includes nine dimensions of father involvement, namely discipline and responsibility, mother support, school encouragement, providing, time and talking together, praise and affection, developing talents, reading/homework support, and attentiveness. To reduce participant burden within the PIF Study, the original IFI measure was shortened to include 5 of the original 9 dimensions which comprise the father involvement measure, namely; school encouragement, mother support, providing, developing talents and future concerns, and attentiveness. Scores for each of the dimensions are derived from a series of questions relevant to each particular component of fathering. Each question is scored using a Likert scale of 0-6, with a score of 0 being very poor and a score of 6 being excellent. In analysing the IFI data, scores for father involvement were categorized into tertiles. This was necessary

because of the high median scores reported for each of the 5 individual dimensions of father involvement, and the overall involvement score. Information about the reliability and validity of the IFI measure is discussed by Hawkins et al. (2002), and produced Chronbach's alpha values for the individual dimensions of the IFI e.g. .82 for school encouragement, .87 for mother support, .69 for providing, .75 for developing talents, and .69 for attentiveness.

Child Behaviour Checklist (CBCL). CBCL responses from Pacific fathers were used in the analysis for this study. The CBCL 1.5-5 years version is a 99-item standardised questionnaire designed to obtain ratings of behavioural/emotional problems by parents or caretakers of children aged between 1.5 and 5 years of age (Achenbach & Rescorla, 2000, 2001). The CBCL includes total problem scores, two broad-band syndromes, internalising and externalising, and seven narrow-band syndromes: emotionally reactive, anxious/depressed, withdrawn, somatic complaints, sleep problems, attention problems and aggressive behaviour. This measure has been widely used in both clinical and community populations and extensive information is available about its reliability and validity (Achenbach & Rescorla, 2000, 2001). In our study, the internal consistency was tested producing a Cronbach's alpha of 0.82 for Internalising, 0.86 for Externalising, and 0.93 for Total Problems. These results showed that the internal consistency within this cohort was satisfactory for the CBCL and supported the appropriateness of using this checklist with this Pacific cohort.

Within the CBCL measure, the score for internalizing behaviour is derived as the sum of scores for 32 questions within three syndromes: *anxious/depressed*, *withdrawn* and *somatic complaints*; and externalizing behaviour scores are derived from 35 questions within two syndromes: *aggression* and *rule breaking*. The CBCL is assessed on a 3-point Likert-type scale: 0=Not true, 1=Somewhat or Sometimes true, and 2=Very

true or Often true. Higher scores indicate greater degrees of behavioural and emotional problems. In order to determine clinically relevant cases, using the cut-off values recommended by Achenbach and Rescorla and the results from our sample, the 83rd and 90th percentiles were used to define the borderline and clinical ranges for internalizing, externalizing and the total problem score within our cohort of Pacific children from the PIF Study.

Socio-demographic and other variables. Father reports of ethnicity, paternal age, education level, maternal relationship, weekly household income, relationship to the child, and potential mental health disorder, were collected and incorporated in the analysis. All socio-demographic and confounder variables included in this analysis were selected due to their identification in previous research as being associated with fathering, child behaviour, or the overall health of Pacific children (Flouri, 2005; Hill & Liang, 2008; Iusitini, Gao, Sundborn, & Paterson, 2011; Loureiro, Sanz-de-Galdeano, & Vuri, 2006; Ministry of Health, 2008a). Acculturation status amongst participants was assessed using the General Ethnicity Questionnaire (GEQ) (Tsai, Ying, & Lee, 2000).

Alcohol drinking and tobacco smoking measures were also included in the analysis as markers of lifestyle risk factors. In order to measure alcohol consumption, fathers were asked how often they drank alcohol in the past 12 months. To measure tobacco usage, fathers were asked how many cigarettes they had smoked the previous day. These variables were then categorized for analysis into smoking status of yes or no, and alcohol drinking status of abstainer, monthly or less, or more than once a month.

Statistical analysis

All statistical analyses were performed using SAS version 9.3 (SAS Institute Inc., Cary, NC, USA) software and $\alpha=0.05$ was used to define statistical significance, except where otherwise explicitly stated.

Recognising within child correlations between CBCL measures, generalised estimating equation (GEE) models were adopted to analyse internalising and externalising behaviour indicators simultaneously, using an unstructured correlation matrix and robust estimators of variance. Statistical model development for regression analysis followed methods advocated by Sun et al. (1996). Initially bivariable comparisons were employed to compare socio-demographic and potential confounding variables with father involvement and CBCL. From these comparisons, all variables with a p-value < 0.20 were then included in further analysis using a saturated multivariable regression model. This model utilized a manual backward selection process to sequentially eliminate the least significant variable (using Wald's statistic), then to re-analyse the model, until all remaining included variables had an overall p-value < 0.05. This hierarchical model development approach was deemed the most appropriate approach to select the variables of most significance for multivariable analysis, and to reduce the chance of variable rejection due to confounding (Sun et al., 1996).

Ethics

Ethical approval was obtained from the National Ethics Committee, the Royal New Zealand Plunket Society, the South Auckland Health Clinical Board, and the AUT University Ethics Committee (AUTEK).

RESULTS

Description of sample and characteristics

Demographics characteristics of the sample are shown in Table 1. Most, 571 (97%), Pacific fathers interviewed at the 6-years phase were the biological fathers of the child with 20 adoptive or stepfathers. For ease of exposition, we shall refer to this group collectively as 'fathers' hereafter. Most, 565 (97%), fathers were living with the biological mother of the

child in a married or de facto relationship. The mean paternal age was 38.4 years.

[INSERT TABLE 1 HERE]

Additionally, 42 (7%) fathers reported a GHQ score which is indicative of a potential mental disorder, 222 (38%) fathers were smokers, 316 (53.6%) fathers reported drinking alcohol at least once a month, and 280 (48%) of fathers indicated having a separatist acculturation status.

Child behaviour

Table 2 displays the number of children with normal or problem behaviour scores at the 6-years phase. In order to classify CBCL scores into either normal or problem behaviour categories, children were dichotomised into binary groups for each scale; those with normal CBCL scores, and those with either borderline or clinical CBCL scores. Using this categorisation, there were 401 (67.9%) children that had no problem behaviour indications, 40 (6.8%) children with internalising problem behaviour only, 67 (11.3%) children with externalising problem behaviour only, and 83 (14.0%) children with both internalising and externalising behaviour problems.

[INSERT TABLE 2 HERE]

Father involvement

Table 3 displays the median, 25th percentile (Q1), and 75th percentile (Q3) scores for the five individual dimensions of father involvement together with the global score amongst the cohort of Pacific fathers. Overall the scores were high amongst the cohort, with median involvement scores of 6 out of 6 (the maximum most involved score) for each dimension. This indicates a ceiling effect with data skewed towards the upper range scores.

[INSERT TABLE 3 HERE]

Father involvement and child behaviour

Given the skewed nature of global father involvement, together with the observed ceiling effect, scores were categorized into approximate tertiles for analysis: Tertile 1 or “Lower” ($\text{score} \leq 5.625$), Tertile 2 or “Mid” ($5.625 < \text{score} < 6.000$), and Tertile 3 or “Higher” ($\text{score} = 6.000$). These categorisations were then related to both internalizing and externalizing behaviour outcomes; see Table 4. The crude analysis, using separate logistic regression models, demonstrated a significant relationship between these grouped father involvement score and child behaviour outcomes.

[INSERT TABLE 4 HERE]

Multivariable analysis of father involvement and child behaviour

After bivariable and multivariable analyses, the final parsimonious GEE model between child behaviour outcomes and father involvement also included ethnicity, smoking status, and acculturation variables. No significant interaction between these variables was found (Wald’s type III test, $p > 0.05$). Table 5 displays the results of the final GEE model. It is noteworthy that the lower and mid father involvement categories yielded similar estimated ORs within the internalising and externalising behaviour domains.

[INSERT TABLE 5 HERE]

DISCUSSION

Father involvement

The majority of Pacific fathers reported being very involved with their children, particularly in terms of encouraging them at school, supporting the mother, developing their talents, providing, and being attentive to their needs. Given the substantial literature highlighting the relationship between increased father involvement and positive child behaviour outcomes, these results are very encouraging.

Similar research by Rienks (2011) utilising the IFI to examine father involvement and ethnicity established that Caucasian fathers were less involved with their children compared to African American, Hispanic, and Asian fathers. This finding is consistent with other studies showing differences in father involvement by ethnicity (Hofferth, 2003). These results suggest fathers from ethnic minority groups feel a need to be involved with children in a way that helps prepare them for the likelihood of encountering negative experiences, and may indicate that ethnicity is tied to cultural beliefs about families and the role of fathers (Coley, 2006). Lamb & Tamis-LeMonda (2004) have also identified cultural attitudes and ideologies as important determinants of father involvement, as they shape family types, attitudes and beliefs about gender and parenting, and paternal roles (Lamb & Tamis-LeMonda, 2004). However, further investigation is needed to understand the underlying interactions between culture and father involvement within this cohort of Pacific fathers.

Child behaviour

Approximately 30% of Pacific children within the study displayed some form of internalizing, externalizing, or both internalizing and externalizing behaviour problem (see Table 2). While there is little information available regarding the use of the CBCL measure at a population or cohort level, it has been widely used in NZ (Fitzgerald et al., 2006), and the validity of the CBCL across various cultures has been well documented (Crijnen, Achenbach, & Verhulst, 1997, 1999). Despite considerable variability of

case definition, there is agreement that approximately 10–15% of school children show mild to moderate behavioural problems (Backmann & Schulte-Markwort, 2005). Thus, it appears that the children within our cohort appear to exhibit a prevalence of behavioural problems significantly higher than this predicted range. Potential explanations for this may be that Pacific peoples could have norms that are different from other cultures in terms of perceptions of child behaviour. Pacific parents' perceptions of proper behaviour might be viewed as problematic behaviour by individuals from other cultures, or vice versa. Therefore, the use of the CBCL as a method for indicating problem behaviour amongst Pacific children may require further testing and investigation.

Although literature from previous studies using the CBCL instrument cautions the use of individual summary scores as absolute indicators of problem behaviour, research into child development and behaviour does suggest that early identification and recognition of problems is a valuable guide for the development of successful prevention programmes (Hermanns & Leu, 1998). Previous research findings concerning Pacific children in the PIF study demonstrate that Pacific children whose behaviour was identified as being in the clinical range at one year of age were significantly more likely to be in the clinical range again two years later, compared to non-clinical children (Paterson, Taylor, Schluter, & Iusitini, 2013). Moreover, longitudinal studies in Australia have demonstrated that early childhood problem behaviour is a strong predictor of later adolescent antisocial behaviour (Bor, McGee, & Fagan, 2004).

Father involvement and child behaviour

Results from the crude analysis of associations between father involvement and child behaviour displayed a significant relationship between father involvement and child behaviour outcomes amongst the cohort of Pacific fathers. Regression analyses yielded significant

relationships between father involvement classifications and child behaviour measures, as well as a significant trend illustrating higher father involvement scores were associated with a decreased likelihood of internalising and externalising problem behaviour for children.

These findings complement previous research highlighting the important influence that father involvement has on the development of children, particularly in the areas of cognitive learning and social development (De Luccie & Davis, 1991; Dubowitz et al., 2001; Sarkadi et al., 2008). Therefore, the important role of fathers must be highlighted, and a concerted effort made to inform Pacific fathers about the vital role they hold in shaping the future development of their children.

Strengths and limitations of the research

A key strength of this research is the contribution to the limited data available about parenting within the NZ Pacific community, and the cultural context of fathering. This study comprises a large sample size of Pacific fathers with robust procedures and protocols in place, and can make an important contribution to examining and understanding the relationship and significant factors associated with father involvement and child behaviour outcomes. This will enhance the knowledge base concerning this important area of Pacific health.

An additional strength of the research is the use of standardized instruments for father involvement and child behaviour, the CBCL and IFI scales, and the suite of confounders. Both measurement tools have been validated in prior research studies, highlighting their suitability and robustness. Similarly, the IFI attempts to measure the quality rather than the quantity of parent-child interactions. This consideration is important because positive child outcomes arise principally from the emotional quality and closeness of the father-child relationship, rather than

temporal involvement per se (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000).

A limitation of this research is the self-reported nature of both IFI and CBCL data, which may be subject to recall and social-desirability biases (Paulhus, 1991). Respondent fathers may have been reluctant to endorse child-rearing practices that are considered to be less socially acceptable. Also, the presence of a ceiling effect concerning IFI scores derived from participants, may have contributed to some misinterpretation of results (Rothman & Greenland, 1998). The findings of this research should also be interpreted in light of the presence of attrition bias.

The analysis also indicates the necessity for a stronger more robust method/measure for examining father involvement and behaviour, which is both culturally appropriate and applicable for Pacific populations. The IFI scale developed by Hawkins et al. (2002), was modified for use in this study in order to examine five different dimensions of fathering. However, this measure fails to account for the influence of cultural traditions and practices, as well as the issues of migration and navigation through mainstream NZ society. Previous PIF Study research has highlighted these factors as significant influences for maternal health and social issues (Borrows, Williams, Schluter, Paterson, & Helu, 2010), and findings from this study indicate a similar pattern amongst fathers, with acculturation being a significant mediating variable for both father involvement and child behaviour outcomes.

CONCLUSION

The results indicate a clear association between increased father involvement and positive behaviour outcomes for children, consistent with other international findings (Dubowitz et al., 2001; Flouri, 2005; Flouri & Buchanan, 2003; Palkovitz, 2002; Sarkadi et al., 2008). Pacific men and Pacific fathers have received negligible attention in the literature on

fathering involvement, especially concerning their motivations and behaviours. Yet Pacific fathers are a potentially major contributor to positive developmental outcomes for their children. Encouraging fathers to be more involved with their children is likely to produce benefits not only for their families, but also for the future generations of NZ. With the Pacific population projected to contribute approximately 10% of the total NZ population within the next 10 years, it is vital to strive for understanding about the interactions between Pacific fathers and their families, and encourage them to be more involved with their children.

Key Points:

- Pacific fathers in this study report high levels of involvement with their children; with further analysis indicating associations between increased father involvement and positive child outcomes
- Pacific fathers who are more strongly aligned with their traditional culture may require particular attention, given that their traditional systems or practices of raising children may not emphasise the importance of father involvement as strongly as other cultures.
- Further qualitative research is needed to investigate the underlying motivations and behaviours in relation to father involvement and fathering amongst Pacific men.
- These are important findings within a Pacific framework and may be used to guide social policy and targeted support programmes that are focused on the well-being of Pacific fathers and their children. It is hoped these findings will draw attention to the diversity of beliefs and behaviours in parenting practices among the Pacific population in NZ, and stimulate the development of empirically based and considered ways to approach these complex phenomena.

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Table 1: Distribution of socio-demographics for Pacific fathers at the 6-years phase.

	n	(%)
<i>Age at baseline (years)</i>		
<30	57	(9.6)
30-39	333	(56.4)
≥40	201	(34.0)
<i>Ethnicity</i>		
Samoaan	245	(42.9)
Tongan	191	(33.5)
Cook Islands	54	(9.5)
Other Pacific*	81	(14.2)
<i>Highest educational qualification</i>		
No formal qualifications	215	(45.6)
Secondary	70	(14.8)
Post-secondary	187	(39.6)
<i>Weekly household income</i>		
≤\$500	85	(14.6)
\$501-\$1,000	315	(54.0)
>\$1,000	183	(31.4)
<i>Relationship to child</i>		
Birth father	571	(96.6)
Adoptive father	10	(1.7)
Other	10	(1.7)
<i>Relationship to child's mother</i>		
Married/de facto	565	(96.6)
Separated/single	20	(3.4)

Note: *includes those identifying equally with two or more ethnic groups.

Table 2: Distribution of children's CBCL indications (clinical/board-line) at the 6-years measurement wave.

	N	(%)
No problem behaviour indications	401	(67.9)
Internalising problem behaviour only	40	(6.8)
Externalising problem behaviour only	67	(11.3)
Both internalising and externalising problem behaviour indications	83	(14.0)

Table 3: Median and interquartile range scores for father involvement dimensions amongst participating fathers.

Father involvement scale	Median	(Q ₁ , Q ₃)
<i>Dimensions</i>		
School encouragement	6.0	(5.4, 6.0)
Mother support	6.0	(5.6, 6.0)
Providing	6.0	(6.0, 6.0)
Developing talents and future concerns	6.0	(5.4, 6.0)
Attentiveness	6.0	(5.0, 6.0)
<i>Overall Involvement Score*</i>	5.9	(5.5, 6.0)

*Average of all 5 dimensions.

Table 4: Logistic regression analysis of the relationship between father involvement and child behaviour.

Father involvement	N (%)		Internalising behaviour			Externalising behaviour				
			n (%)	OR	(95% CI)	n (%)	OR	(95% CI)		
Lower	177	(30.1)	44	(24.9)	2.2	(1.3, 3.6)	60	(33.9)	4.3	(2.6, 7.2)
Mid	176	(30.0)	48	(27.3)	2.5	(1.5, 4.1)	63	(35.8)	4.7	(2.8, 7.8)
Higher	234	(39.9)	31	(13.3)	1.0	reference	25	(10.7)	1.0	reference

Table 5: Adjusted GEE analysis of father involvement and child behaviour.

<i>Father involvement</i>	Internalising behaviour		Externalising behaviour	
	OR	(95% CI)	OR	(95% CI)
Lower	1.9	(1.1, 3.3)	4.0	(2.2, 7.1)
Mid	1.9	(1.1, 3.2)	3.8	(2.1, 6.9)
Higher	1.0	reference	1.0	reference

Adjusted for: ethnicity, current smoking status, acculturation status