New Zealand Population Review,46, 70–99.

Family Structure and Change in Early Childhood and the Wellbeing of Tamariki Māori

TAHU KUKUTAI*
KATE PRICKETT†
POLLY ATATOA CARR‡
ARAMA RATA§

Abstract

Internationally there is growing evidence that family structure, and changes in structure, have an impact on children's health and wellbeing and the intergenerational transmission of inequity. The effects, however, vary by socio-economic context and ethnicity. Using longitudinal data from Growing Up in New Zealand ($n = 1349$), we examine family structure and change for tamariki Māori during early childhood, and the potential impacts on their development and wellbeing. We find that a stable two-parent family is the primary experience for tamariki Māori, and sole parenthood is transitory. Diverse family trajectories appear to be linked to poorer cognitive and socio-emotional outcomes but are not the main driver. More important are maternal factors, notably age and education, and material hardship. Importantly, higher levels of cultural connectedness among tamariki Māori, which are associated with diverse family forms, seem to promote socio-emotional development. Our study provides further incentive for policy and programmes that centre equity and support access to the determinants of health for tamariki Māori.

Keywords: tamariki Māori, family structure, family stability, well-being, child development

* Dr Tahu Kukutai is a professor of demography at the National Institute of Demographic and Economic Analysis (NIDEA), University of Waikato. Email: tahu.kukutai@waikato.ac.nz

† Dr Kate Prickett is the director of the Roy McKenzie Centre for the Study of Families and Children, Awhi Rito, Victoria University of Wellington. Email: kate.prickett@vuw.ac.nz

‡ Dr Polly Atatoa Carr is an associate professor at NIDEA. Email: patatoac@waikato.ac.nz

§ Dr Arama Rata is a senior research fellow at NIDEA. Email: arama.rata@waikato.ac.nz

Poipoia te kākano kia puawai
Nurture the seed and it will blossom

From a Māori world view, tamariki Māori (Māori children) are understood to be both the embodiment of their ancestors and the future bearers of collective identity (Cram, 2012). Poipoia te kakano kākano kia puawai is one of many whakatauki that speak to the importance of nurturing and cherishing tamariki. Numerous others reference the significance of culture and identity for positive childhood development, and the collective obligation to raise and care for children aside from one's own.

In Aotearoa New Zealand, the well-being of children is a key policy priority, underscored by the 2019 Wellbeing Budget and the Government's bold ambition for this country to be the best place in the world to be a child.[1, 2] However, for far too many tamariki Māori, this ambition falls far short of reality. Māori children are over-represented on most, if not all, negative indicators of child health and well-being. Access to the determinants of health and well-being is unevenly distributed in Aotearoa New Zealand, and is shaped by inequities that are unfair, systematic, avoidable and unjust (Reid & Robson, 2007). The drivers of ethnic inequities for Indigenous peoples and other racialised populations have been widely studied at a population level (e.g. Jones, 2000; Krieger, 2001; Marmot, 2010; Nazroo, 1999), and in relation to children (World Health Organization, 2008). Increasingly, such studies use a social determinants of health approach focused on the structural and social conditions of poor health (Commission on the Social Determinants of Health, 2008). Historical colonisation and ongoing colonialism have been identified as underlying 'causes of causes' of enduring Indigenous disadvantage (Czyzewski, 2011),[3] particularly in relation to health disparities (Indigenous Health Group, 2007; King et al., 2009; Reid & Robson, 2007). In the social determinants of health framework, household structure and living arrangements are typically considered an intermediary health determinant.

This study examines the potential role of family structure and change on early childhood outcomes of tamariki Māori. It has three aims. First, it describes the patterns of household-based family structures among tamariki Māori. Second, it examines whether their family structure, and changes in family structure, are associated with cognitive, socio-emotional and cultural development during early childhood. And third, it explores whether cultural connectedness positively influences early childhood

development, either directly or indirectly, through the cultural resources associated with specific family formations.

Early childhood is a period shown to be particularly sensitive for children's long-term developmental trajectories and is thus a key intervention point for policy. Understanding the ways in which family structure and stability shapes tamariki Māori development can also sharpen understanding of the intergenerational transmission of inequity. Importantly, we focus on family resources, such as cultural connectedness and family diversity, that are often neglected in research focused on the total population of children but should be considered by policies focused on tamariki Māori well-being. Indeed, this study contributes to the evidence base that promotes a more Māori-centric understanding of child well-being. In so doing, we support the call for tamariki Māori research that focuses on inherent strengths and capabilities rather than dysfunction, investigates factors that support and promote healthy development, and acknowledges the importance of culture (Cram, 2019; Durie, 1997, 2003; Pitama et al., 2002).

Background

Family structure and change

The so-called 'second demographic transition' has occurred across most wealthy, highly developed Western nations, including Aotearoa New Zealand. It is characterised by delayed marriage, delayed childbearing, childlessness, increases in the proportion who never marry, and substantial increases in non-marital cohabitation, non-marital fertility (including within cohabiting unions), maternal employment and divorce (Lesthaeghe, 1995; Lesthaeghe & van de Kaa, 1986; Lesthaeghe & Moors, 2000; van de Kaa, 1987).

The literature suggests that the growing diversity of family types has also been accompanied by an increase in family structure change across children's life courses (Cavanagh, 2008). In the United States, studies show that cross-sectional data significantly underestimate the complexity and dynamic nature of children's family arrangements (Cavanagh, 2008). While point estimates indicate that most children live with both biological parents, life course estimates suggest that more than half of all children will spend at least some time in a different family configuration involving, for example,

a sole parent, cohabiting step-parent, or married step-parent family (Bumpass & Lu 2000). Understanding the relationship between family context and childhood well-being thus requires us to consider both the diversity of children's family living arrangements as well as changes in these formations across childhood and adolescence.

In Aotearoa New Zealand, there is a dearth of research on family structure change, partly due to a lack of data on family transitions. Most studies of household and family structure use census and survey information that can only provide a cross-sectional snapshot of what household-based families look like at one point in time. These studies reveal little about how living arrangements change and evolve, and the length and frequency of different relationship and family states (Law Commission, 2017). Cross-sectional studies show that tamariki Māori are more likely than other children to live in a sole parent household at any given time (Dharmalingamet al., 2004; Kiro et al., 2010). However, we have limited knowledge about what proportion of childhood is spent in different family structures, or how stability or instability shapes well-being over the life course, particularly during children's early formative years.

Aside from data challenges, there are also important conceptual limitations to studies of Māori family structure. Although sometimes used interchangeably in the literature, the terms family, whānau and household have different theoretical and substantive meanings. *Whānau* extends beyond the immediate family or household and generally encompasses "a multigenerational collective made up of many households that are supported and strengthened by a wider network of relations" (Taskforce on Whānau-Centred Initiatives, 2010, p. 13). A recent study using data from Te Kupenga, the nationally representative survey of Māori well-being, found that household living arrangements were a relatively poor predictor of how Māori described who belonged to their whānau. Only 40 per cent of respondents defined their whānau solely in terms of immediate family members (Kukutai et al., 2016).

While whānau is a more meaningful and enduring concept in te ao Māori than family (Lawson-Te Aho, 2010), in practice most statistical studies of Māori whānau and families relate solely to household-based family units or households. Our study also has this limitation in that we can only define families based on household living arrangements, rather than broader concepts of relatedness rooted in whakapapa or genealogical

connection. The focus on household structures of tamariki Māori cannot capture the depth and breadth of whānau relationships. Nevertheless, the household-based family is a vital part of the broader whānau complex, providing an important (though not exclusive) context for the nurturing and socialisation of tamariki. The protectiveness and resilience of the households in which tamariki live may also have broader benefits for the well-being of the wider whānau.

Effects of family structure and change on child development and well-being

Internationally there is growing evidence that family structure and changes in structure have an impact on children's health and well-being and the intergenerational transmission of inequity (Fomby & Bosick, 2013; Härkönen et al., 2017; Mackay, 2005). Family instability has been defined as children's exposure to repeated changes in a parents' union status (Fomby et al., 2010), or situations where children grow up without the same parent(s) who were present at their birth (Waldfogel et al., 2010). The research suggests that family instability and the associated disruption in early childhood can have adverse consequences on child well-being outcomes. The effects, however, may vary by socio-economic context (Ryan et al., 2015) and across ethnic and racial groups (Cavanagh & Fomby, 2019; Fomby & Cherlin, 2007; Fomby et al., 2010).

Commonly studied is the role of divorce or parental separation. Meta-analyses by Amato and Keith (1991) and Amato (2001) found parental divorce during childhood was correlated with decreased school achievement, behaviour and conduct issues, decreased self-confidence and self-concept, and poor social relations. In international studies, parental divorce or separation has also been associated with poorer psycho-cognitive outcomes at later stages of childhood (Cavanagh & Huston, 2008) and young adulthood (Fomby & Bosick, 2013; Fowler et al., 2015). Other international research has considered the adverse impact of multiple changes in parents' relationship status on childhood psycho-social development and later life well-being (Dunn et al., 1998; Wu & Martinson, 1993). These associations, however, commonly have small effect sizes, are not consistently determined, and causality is contested (Mackay, 2005).

Studies suggest that the effect of family instability on child well-being might be lower for marginalised groups, either because social

protection mechanisms such as access to a broader network of kin and kin-like figures or the effects of instability are of diminished importance compared with the stress arising from financial insecurity (Cross, 2020). Fomby and colleagues (2010) found that both social protection and socio-economic stress partially explained ethnic/racial differences in the effect of family stability on adolescent risk behaviour. Among White adolescents, social protection factors attenuated the effect of family structure transitions on each of the three outcomes. The same was true for African American and Mexican American adolescents with regard to 'delinquency', but not the other outcomes. Other studies have also found smaller responses to parental change for African American teens compared with White teens (Fomby & Cherlin, 2007; Fowler et al., 2015).

A more recent study found that children who moved into sole parent families during preschool (age 3–4 years) had higher behaviour problem scores than children who experienced no pre-school change, but the impact was only observed for children from high-income families (Ryan et al., 2015). The authors suggested that in families with fewer economic resources at stake and where sole parent and blended families were more common, the disruption caused by family change may be less severe. They concluded that "many factors other than family instability shape the course of children's behavioural trajectories, particularly for children in low-income families" (p. 123), and that it was important to pay attention to both the type of change and family context. In te ao Māori, part of this context is cultural context. It is to this that we now turn.

The importance of cultural connectedness

Links between ethno-racial identity and psycho-social functioning are well established in the literature. *Ethnic identity*, or how good one feels about their membership of an ethnic group, is positively associated with many characteristics. These include self-efficacy (Smith et al., 1999), satisfaction with personal life (Houkamau & Sibley, 2011), quality of life (Utsey et al., 2002), self-confidence, purpose in life (Martinez & Dukes, 1997), and self-esteem (Bracey et al., 2004; Martinez & Dukes, 1997; Phinney, 1992; Roberts et al., 1999). The benefits of having a secure ethnic identity have been explained as both promotive (i.e. enhancing psychological well-being under normative conditions) as well as protective (i.e. mitigating psychological harm in the context of adversity), and has been demonstrated

across a wide range of ethnic groups, in various socio-political contexts (see Neblett et al., 2012, for a review; also Clark et al., 2011; Williams et al., 2018).

A growing body of theoretical and empirical work suggests that having a secure ethnic identity is linked to the use of adaptive coping strategies, such as social support. Sarche and Spicer (2008) described how social support from extended family can lead to psychological well-being for children in culturally embedded American Indian and Alaska Native communities. They noted the close relational bonds formed between children in these contexts with members of their extended families as well as non-kin tribal members. These significant others guided children's behaviour and transmitted the cultural values by which tribal members lived.

McCubbin (2006) measured the ethnic schema (i.e. the cultural values, beliefs, expectations and priorities) of Native Hawaiian families, and found that family ethnic schema predicted individual psychological well-being. This relationship, she suggested, was accounted for by a strong ethnic schema, providing the family with a shared world view, determining how information and behaviours were to be evaluated, and guiding problem-solving behaviours.

In Aotearoa New Zealand, Durie (1997) has described Māori cultural identity as a "critical prerequisite" of wellness, and has suggested that Māori culture "provides a value system and a framework for living" (Durie, 2003, p. 62). The literature suggests a number of ways in which *whanaungatanga* (sense of family connection) supports child well-being, with the dominant themes relating to the reciprocity of care and support and the transmission of identity. Pitama et al. (2002) identify four key principles that underpin Māori child-rearing:

- the significance of whakapapa which confirms an individual's membership and participation rights within her or his kin groups
- the notion that children are not the property of their parents, but rather belong to their wider whānau, hapū and iwi
- the rights and responsibilities for raising children are shared, and
- children have rights and responsibilities to their whānau. (p. 93)

Whether cultural connectedness buffers the effects of family change on child well-being or is associated with factors that predict both family stability and child well-being is a question to be explored in the next section.

Method

Data and sample

We employed data from Growing Up in New Zealand (GUiNZ) – Aotearoa New Zealand's largest, most contemporary and ethnically diverse birth cohort study (Morton et al., 2012). Findings from this study are able to provide population-relevant and generalisable information to inform policy development for children and their families (for more detail, see Morton et al., 2015). The final analytical sample for this study consisted of 1349 children who were identified as Māori by a parent (almost always their biological mother). To be included in the study, children's parents needed to have been interviewed at the 9-month-old wave (when many covariates were measured) and at the 54-month-old wave (i.e. the 4.5-year-old wave when child outcomes were assessed). Children not in the 23- or 45-month-old waves but who were at the 9- and 54-month-old waves were included. Based on these criteria, 194 tamariki Māori were dropped from the study (12.6 per cent of the Māori sample). Most of the children excluded from the analytical sample had fully exited the GUiNZ study by the 54-month-old wave (i.e. not just missing 54-month-old data). Excluded children were less likely to be in a two-parent-only family structure and more likely to be in homes with other adult kin at the antenatal wave. The bias that may have resulted from this attrition probably makes the estimates presented more conservative.

In this study, we used data from the antenatal wave and waves when the focal child was 9 months, 23 months (i.e. approximately 2 years), 45 months (i.e. approximately 3.5 years old), and 54 months (i.e. approximately 4.5 years old).

Measures

Family structure

We examined family structure data available at the antenatal stage and when the focal child was 9 months, 23 months, and 45 months old. Family structure was not available at the 54-month-old wave (i.e. when the child was approximately 4.5-years old), the wave in which child outcomes were measured. In total, we were able to include family structure measures at four time points. The family structure variable was used in the social

sequence analysis (Aim 1) to construct the family structure trajectories that are used in the structural equation models (SEM) (Aim 2 and Aim 3).

In the externally available GUiNZ data set, family structure is coded by the GUiNZ research team into four mutually exclusive groups from a household roster reported by the primary respondent (mostly the biological mother):

1. living with two parents and no other adults
2. living with one parent and no other adults
3. living with one or two parents, and other adults who are kin
4. living with one or two parents, and other adults who are not kin (and potentially other adults who are kin).

There are three primary limitations in this conceptualisation of family structure. First, we cannot determine whether in households that include other adults, one or both of the children's biological parents are present. Second, in two 'parent' households, we do not know whether the parents are biological. Third, we do not know the relationship of other adult household members to the focal child. This means, for example, that a household where there are one or two parents and other related adults (i.e. family structure group 3, above) could be a sole mother living with her adult sister (e.g. the child's aunty) or a two-parent family living with the child's grandmother, among other examples. In this way, there is heterogeneity within the third and fourth household groups not captured by the family structure measure.

Outcomes

We focused on the cognitive and socio-emotional aspects of development, in line with the literature that points to these measures as early predictors of children's lifelong developmental trajectories. We examined cultural connectedness as a developmental outcome in line with an emerging body of research that has highlighted the importance of cultural connectedness as a protective and resilience resource connected to children's health and well-being, particularly among Indigenous populations (e.g. Bracey et al., 2004; Houkamau & Sibley, 2011; Martinez & Dukes, 1997; Smith et al., 1999; Utsey et al., 2002; Webber, 2012).

Cognitive development

This is a latent construct identified through 10 items that tap into aspects of vocabulary, numeracy, and literacy – key cognitive areas that also indicate school readiness.

Socio-emotional development

Two measures tapped into two aspects of socio-emotional development: negative affect and effortful control. Each measure was constructed from 12 validated items (averaged) from the parent-reported Child Behavior Questionnaire Very Short Form (CBQ-VSF) (Putnam & Rothbart, 2006). *Negative affect* is characterised by higher scores on feelings of sadness, fear, anger and discomfort, and lower scores on soothability and reactivity. The internal consistency (Chronbach's alpha) for the study sample of Māori children was $\alpha = 0.70$. *Effortful control* points to the extent to which children show they can manage their attention and use controlled behaviour, particularly in situations where they may not want to be. The internal consistency for Māori children in this study was also $\alpha = 0.70$. The internal consistency for both measures was similar to that of children of all ethnicities in the study.

Cultural connectedness

This is another latent construct consisting of ten items that tap into elements of language, activities and identification:

- being able to speak te reo Māori (*1* = yes; *0* = no)
- frequency of using te reo Māori to greet and farewell others (*0* = never to *3* = often)
- frequency of using te reo Māori to introduce themselves
- frequency of speaking simple words in te reo Māori
- frequency of recognising and responding to simple spoken te reo Māori words
- frequency of using te reo Māori to communicate personal information, such as iwi, hapū, and home town
- frequency of parent and child reading together about their ethnicity or culture
- frequency of child listing to their ethnic or cultural music
- frequency of attending ethnic or cultural celebrations

- frequency of parent discussing the differences between their ethnicity or culture and other ethnic or cultural groups with their child

Although to our knowledge this latent construct has not been used before, there appeared good construct validity based on model fit statistics and internal consistency ($\alpha = 0.85$).

Covariates

A range of covariates were included in the analyses. These included *child characteristics* (child sex, low birth-weight status, developmental problem(s) by the 9-month wave, and child's age in months at the 54-month interview), *maternal characteristics* (her age at the child's birth, whether she was employed, whether she identified as Māori, her highest educational attainment), *family characteristics* (hardship index, number of siblings in the household, residential moves over the study period), and *geographic indicators* (meshblock deprivation, living in a rural area, and district health board as a proxy for region).

Analytical plan

To examine patterns of family structure, change and timing of transitions (Aim 1), we applied social sequence analysis to the GUiNZ data to examine patterns of family structure during early childhood. Social sequence analysis is a statistical approach used to examine patterns of social events or circumstances over time, where pair-wise dissimilarities are computed between sequences. A clustering process is applied to the dissimilarities to determine the appropriate typology to group individual trajectories of experiences (Ritschard & Studer, 2018). This statistical approach allows for the consideration of patterns in family structure type, the stability and types of changes in family structure, and at which developmental period those changes happen. Analytically, sequence analysis also provides a more manageable way to categorise the numerous trajectories of experiences. To preview, the results of the sequence analysis revealed four typical profiles of family structure and stability for tamariki Māori over early childhood.

To examine whether these profiles were associated with child development (Aim 2), we employed structural equation models (SEMs). This allowed us to model the association between family structure trajectories

and child outcomes in a multivariate framework, controlling for factors that may be endogenous to both selection into various family structures and child outcomes, such as material hardship.

The third aim tested whether cultural connectedness was associated with, or acted as a mediator of, family structure and stability and children's cognitive and socio-emotional development. In these analyses, we estimated the direct effect of family trajectories (over the antenatal to 45-month interview period) on cognitive and socio-emotional outcomes (at the 54-month wave). We also estimated the average portion of that direct effect that is explained by differences in cultural connectedness (at the 54-month wave) among those family trajectories (i.e. the indirect effect). This was done by simultaneously estimating the associations between family trajectories and cultural connectedness, and the subsequent association between cultural connectedness and cognitive and socio-emotional outcomes.

The social sequence analysis was conducted in R, while all other analyses were conducted in Stata. Multiple imputation was conducted on the small number of item-level missing data to create 100 multiple-imputed datasets, with the suite of *mi estimate* commands used to analyse the data sets.

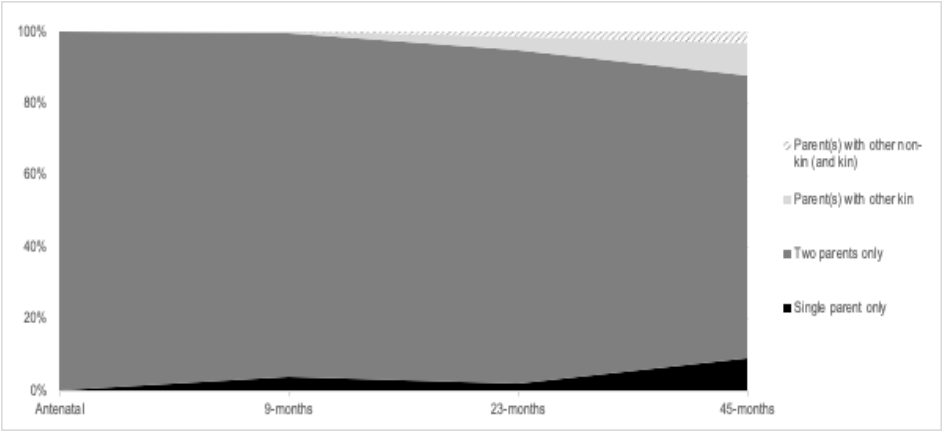
Results

Aim 1: Family structure and change during early childhood for tamariki Māori

These profiles are represented in Figures 1–4 below. Figure 1 represents the profile that a majority of tamariki Māori experienced ($n = 740$; 55 per cent of the sample). In this profile, most children were born into a home with just their mother and father and stayed consistently living with their parents during their first four years of life. This group also experienced the most stability, with an average of 0.4 changes during the study period compared with 0.7 among the total sample.

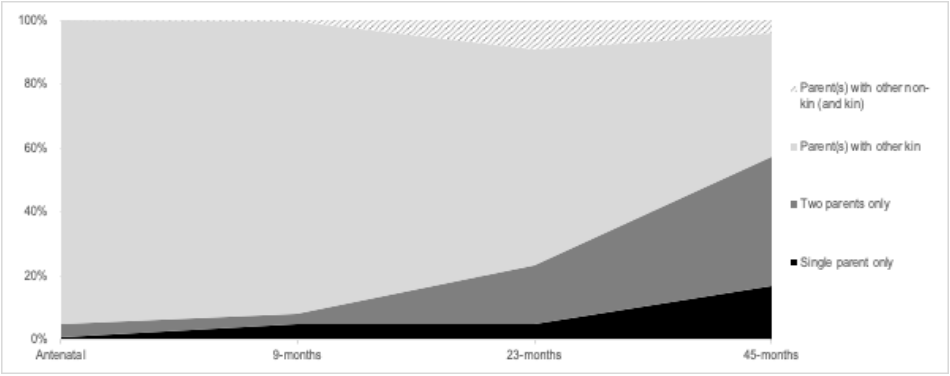
The second most common experience is represented in Figure 2. One-third of the sample ($n = 448$) fell into this profile. This typically reflected living with one or both biological parents with other kin adults in the household, transitioning sometime in early childhood (between the 9- and 23-month waves) to a two-parent household. Children with this family profile experienced 1.0 transitions, on average.

Figure 1: Family trajectory type 1 – Stable, two parents



Note: Data from Growing Up in New Zealand. $n = 740$ (55% of total sample).

Figure 2: Family trajectory type 2 – Living with kin, late transition to mostly two-parent family



Note: Data from Growing Up in New Zealand. $n = 448$ (33% of total sample).

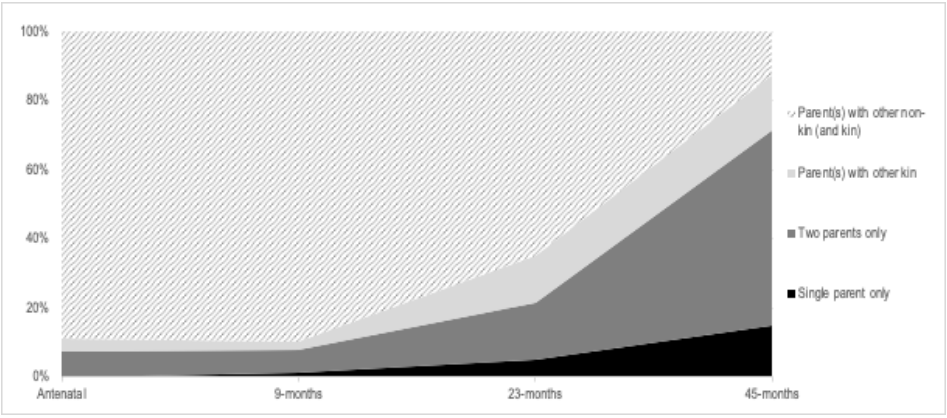
The remaining children were split evenly in the final two profiles (6 per cent in each group). Figure 3 displays a pattern of children living with one or both parents but also with other adults (kin and non-kin), with multiple changes in family structure (i.e. high instability) over early childhood ($n = 80$). These children experienced 1.4 changes, on average. The final group, represented in Figure 4, consists of children who experienced early life living with one parent only (almost exclusively their mother), but with a transition to some other family structure type much later during early childhood (between the 23- and 45-month waves) ($n = 81$). Children in this group experienced 0.6 transitions, on average.[4]

Aim 2: Family trajectories and early childhood development

Table 1 displays the key results from the SEM analyses examining the associations between family trajectories and child outcomes at the 54-month wave. The full model results are presented in Table A1 in the appendix.

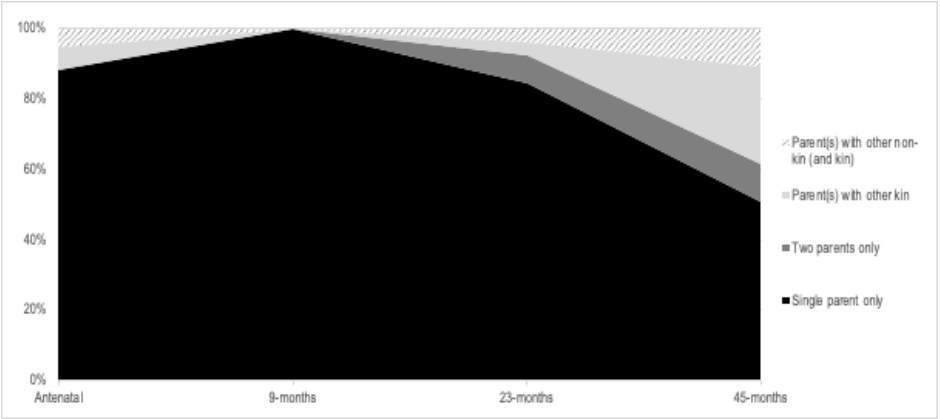
Model 1 (M1) displays estimates where only child characteristics were included as controls. Model 2 (M2) included the full set of covariates including maternal characteristics, family characteristics, and geographic indicators.

Figure 3: Family trajectory type 3 – Living with others with instability



Note: Data from Growing Up in New Zealand. $n = 80$ (6% of total sample).

Figure 4: Family trajectory type 4 – Sole parent with very late transition to living with others



Note: Data from Growing Up in New Zealand. $n = 81$ (6% of total sample).

Cognitive development

After controlling for the full set of covariates (Model 2), there were no longer any statistical differences (at traditional significance levels) between family trajectories and cognitive development. In this way, much of initial association between family profile and cognitive development was explained by factors that are associated with both family trajectories and cognitive development (e.g. maternal age, lower levels of maternal education, material hardship, a mother identified as Māori, living outside of Counties Manukau and Waikato, number of siblings). Child-level factors, namely low birth weight, gender and age in months at the 54-month interview (because interviews were often conducted during months either side of their birth month), were also significant predictors of variation in cognitive development.

Socio-emotional development

After controlling for the full set of covariates (Model 2), children living with one parent with a very late transition to living with others were predicted to have a 0.28 higher negative affect score ($p < 0.05$) compared with children in the stable two-parent trajectory. As a comparison, this coefficient size equates to approximately three standard deviations above the mean, or the difference between being near the top versus the bottom on the material hardship scale. Similarly, children living with kin with a late transition were associated with a 0.11 higher negative affect score ($p < 0.01$), the difference between being at a four on the hardship scale versus two (1.5 of a standard deviation above the mean). Maternal education, whether the mother identified as Māori, and material hardship were also associated with negative affect.

There was no significant association between family structure and effortful control. Maternal age, child gender and child's age at the 54-month interview were the only significant factors.

Table 1: Structural equation models predicting child outcomes at the 54-month interview

	Cognitive development		Negative affect	
	M1	*M2*	*M1*	*M2*
	Child covariates	All covariates	Child covariates	All covariates
Family trajectory (ref: Stable two parents				
Living with kin, late transition to mostly two parents	–1.230** (0.360)	–0.177 (0.369)	0.223*** (0.048)	0.111* (0.052)
Living with others with instability	–0.091 (0.692)	0.185 (0.672)	0.086 (0.094)	0.016 (0.095)
Sole parent with very late transition to living with others	–2.92*** (0.692)	–1.166† (0.669)	0.423*** (0.094)	0.277** (0.095)
	Effortful control		**Cultural connectedness**	
Living with kin, late transition to mostly two parents	–0.069† (0.038)	-0.021 (0.042)	0.120* (0.05)	0.088 (0.057)
Living with others with instability	0.039 (0.075)	0.063 (0.076)	0.207* (0.103)	0.230* (0.104)
Sole parent with very late transition to living with others	–0.025 (0.074)	0.002 (0.076)	0.328** (0.105)	0.206* (0.105)

Notes: 1. Standard errors in parentheses. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$.
2. $n = 1349$.

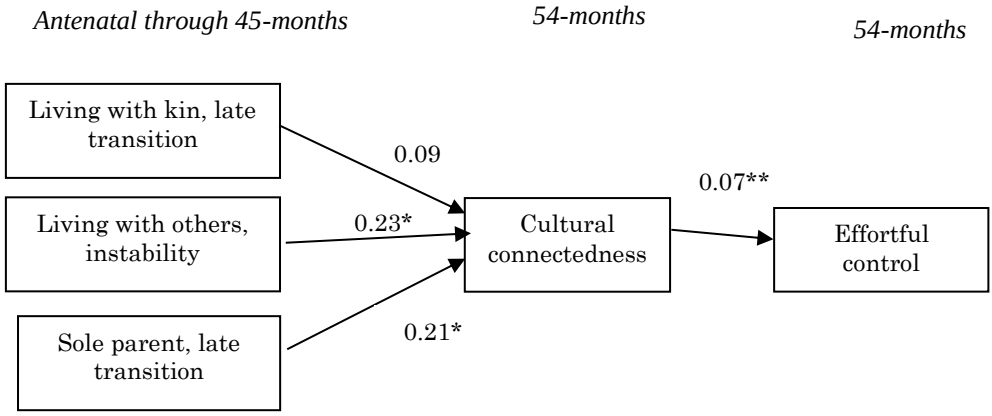
Cultural connectedness

In a different pattern of results, being in family structures that included living with other adults in addition to a parent was associated with higher reports of cultural connectedness among tamariki Māori. Based on results from Model 2 (full model), family trajectories that involved living with other adults with high instability (0.23; $p < 0.05$) and living in sole parent families with a late transition (0.21; $p < 0.05$) were associated with higher levels of cultural connectedness compared with children in stable two-parent households and those living with other kin adults with a late transition to two-parent households.

This finding is consistent with the associations between cultural identity and household structures that are not two-parent-only homes observed in descriptive analyses of Te Kupenga (Kukutai et al., 2015). With respect to maternal factors, lower levels of education, younger age and Māori identification were also associated with higher cultural connectedness, as well as number of siblings ($p < 0.05$) and the child's gender (female).

Overall, we tested the mediational pathway between family trajectories, cultural connectedness and the three cognitive and socio-emotional outcomes. We found only one significant pathway for the socio-emotional development outcome of effortful control. The findings are presented in Figure 5, with full model results across all outcomes presented in Table A2 in the appendix.

Figure 5: Mediation path analysis: Family trajectories, cultural connectedness, and effortful control (n = 1349)



Note: ** $p < 0.01$; * $p < 0.05$.

In this model, cultural connectedness, generally, was associated with effortful control. This self-regulation is particularly important for prosocial behaviour and for participating in learning environments and elsewhere. It has been shown to have ongoing effects over the life course, with higher self-control in childhood associated with greater financial stability, better health and much lower odds of criminal offending as an adult (Moffit et al., 2013). Mediational analyses pointed to a statistically significant pathway linking family trajectories that were not consistently two-parent households to greater levels of cultural connectedness, which in

turn, was linked to higher levels of effortful control. In short, had these family structures not also been correlated with higher levels of cultural connectedness, there may have been a wider (and significant) gap in effortful control.

Conclusion

Early childhood is a sensitive period that lays the foundation for lifelong trajectories of status attainment, socio-emotional well-being and health. Young children spend most of their time with their family, making the family an important ecological context for their early development. In Aotearoa New Zealand, prior research has documented substantial differences in family structure by ethnicity but there is a dearth of literature on family change and childhood development and well-being. This study has partially tried to address this gap by examining family structure transitions across early childhood for a recent cohort of tamariki Māori. We have also tried to identify if and how these family experiences are associated with early childhood development. Three key findings emerged:

1. A stable two-parent family was the typical experience for tamariki Māori, and sole-motherhood is transitory.
2. Diverse family trajectories, such as initially living with a sole parent or with other non-parent adults in the home, were linked to poorer cognitive and socio-emotional outcomes but are not the cause.
3. Diverse family trajectories that included living with other non-parent adults (in addition to parents) were associated with greater cultural connectedness, which in turn, promoted socio-emotional development.

The results of this study are timely given the prioritisation of child well-being in current and future policy settings. One of the key principles underpinning the draft outcomes framework of the Child and Youth Wellbeing Strategy is that the "wellbeing of children and young people is interwoven with the wellbeing of the family and whānau" (Department of the Prime Minister and Cabinet, 2019). This focus on the child–whānau nexus entails a clear understanding of the complexity, diversity and fluidity of the family and household context, and the links with child well-being and development.

Our findings strongly suggest that the development and well-being of tamariki Māori has less to do with family structure and change than the factors that are associated with – or that select people into – various family forms. These include maternal education, material hardship and parental age. Some of these factors are modifiable and can be targeted through policy settings. Further understanding of the associations between maternal ethnicity and child well-being demonstrate how maternal ethnicity is a proxy for broader social, political or environmental factors including constrained opportunities to obtain quality education, meaningful work and affordable, healthy homes. This provides further incentive for policy and programmes that centre equity and support access to the determinants of health for Māori whānau. Of relevance here is the recent Welfare Expert Advisory Group Report (WEAG, 2019) which called on the Government to modernise eligibility rules to reflect the diverse and fluid nature of families and arrangements for the care of children. The report noted that: "In many cases, sole parenthood means reliance on a benefit and is associated with a high risk of poverty" and recommended an approach that enabled individuals and whānau to live a more dignified life and participate more fully in their school, community and cultural lives. For whānau Māori, such an approach might include papakāinga/Māori models of housing that support whānau to live in close proximity to each other to support child development and cultural identity; non-punitive student allowances that support parents to be educated without losing vital income and support if a family member moves in to help; and childcare/kōhanga subsidies that support whānau back to work without unaffordable childcare fees and relying on whānau support.

Our findings also highlight the potential importance of cultural connectedness as a protective family feature that can enhance child outcomes. This aligns with a proposed focus area in the Child Wellbeing Strategy (DPMC, 2019) of recognising and supporting the cultures of children, youth and their families and whānau ora well-being outcomes.[5] It is also consistent with prior research showing that culturally affirming practices can improve the social and emotional development of children. This supports the wider view that policy responses to strengthen whānau connections are most likely to be effective when linked to measures to strengthen cultural connections more generally (Cram, 2019; Kukutai et al., 2016; Muriwai et al., 2015).

This study, however, is not without limitations. First and most importantly, there are some limitations to our family structure identification: we were not able to determine whether in households that include other adults, one or both of the children's biological parents are present; whether both parents were biological in two-parent families; the relationships of other adults in the household to the child; and family structure at the 54-month wave. Moreover, we do not know about family structure changes between waves (like most other longitudinal birth cohort studies). In this way, we are likely underestimating the actual instability experienced and not accounting for potential differences in the types of roles and relationships among people in the household. Second, the data limitation (again, shared with most longitudinal studies) is that we necessarily conflate household structure with family structure, and that we are not able to tap into the broader meaning of whānau and, therefore, how whānau may matter above and beyond more narrow conceptualisations of family for child development. Third, correlation is not causation. While we demonstrate associations between family structure trajectories and child development, this association could potentially be explained by covariates not included in the models. Fourth, and in line with the prior limitation, we assumed a causal pathway whereby households with other adults and sole-parent families promoted more cultural connectedness, which in turn was associated with their socio-emotional development. Indeed, arguments could be made for a different mediational chain; i.e. being culturally connected leads to more diverse family forms. Although we tested this particular reverse causal pathway and did not find it to be significant (results available upon request), future data collection on families could mitigate this issue through repeated and consistent measures, adjusted for age-graded differences in children's developmental phases.

Overall, understanding the needs and circumstances of tamariki Māori and providing a solid evidence base upon which to act requires more than robust monitoring and measurement. It also requires a conceptual approach that is aligned with the well-being of those whom it purports to represent. Recently Cram (2019) argued the case for the development of tamariki Māori well-being indicators that go beyond conventional measures of child development and well-being to measure Māori-centric understandings of child well-being such as wairua, mana and mauri (Walker, 2008). Despite the sharper policy focus on child and whānau well-

being, there is not yet a data set that measures tamariki Māori well-being, whānau well-being (as distinct from family characteristics and conditions), and extended whānau structures beyond household configurations.

The fullness and richness of whānau, as understood in te ao Māori, remains largely hidden from the purview of statistical studies that are constrained by the available data. These challenges, combined with growing concerns about Māori data sovereignty (Te Mana Raraunga, 2018), suggest the time is ripe for rethinking the collection and analysis of data as they relate to tamariki Māori and their whānau. Moving forward, it is critical that Māori are at the centre of decision making about what a more fit-for-purpose approach to reporting on tamariki and whānau well-being looks like.

Acknowledgements

We wish to acknowledge the Ministry of Social Development and, in particular, Kahukore Baker for commissioning the research described in this paper. We also thank the reviewers of that report, especially Associate Professor Terryann Clark. The full report can be accessed on MSD's website. We are extremely grateful to all the families who took part in Growing Up in New Zealand and created such a valuable database. Ngā mihi mahana ki a koutou. Thank you also to the Growing Up in New Zealand team. Any errors or omissions are ours alone.

Notes

1 treasury.govt.nz/publications/wellbeing-budget/wellbeing-budget-2019.

2 The Department of the Prime Minister and Cabinet's child well-being outcomes framework to make New Zealand the best place in the world for children can be found here: childyouthwellbeing.govt.nz/resources/child-and-youth-wellbeing-strategy

3 Colonisation refers to a process of geographical incursion, dispossession and displacement, political control and ideological domination (Brown, 2012).

4 Interestingly, just 2.5 per cent of the total analytical sample reported living with a sole mother at every time point. This finding is in contrast to the portrayal of the perceived ubiquity of Māori sole motherhood.

5 Whānau Ora outcomes include whānau that are: cohesive, resilient and nurturing; participating in te ao Māori; self-managing and empowered leaders; and economically secure.

References

Amato, P. R. (2001). Children of divorce in the 1990s: An update of the Amato and Keith (1991) meta-analysis. *Journal of Family Psychology*, *15*, 355–70.

Amato, P. R., & Keith, B. (1991). Parental divorce and the well-being of children: A meta-analysis. *Psychological Bulletin*, *110*, 26–46.

Bracey, J. R., Bámaca, M. Y., & Umaña-Taylor, A. J. (2004). Examining ethnic identity and self-esteem among biracial and monoracial adolescents. *Journal of Youth and Adolescence*, *33*, 123–132.

Brown, H. J., McPherson, G., Peterson, R., Newman, V., & Cranmer, B. (2012). Our land, our language: Connecting dispossession and health equity in an indigenous context. *Canadian Journal of Nursing Research, 44*(2), 44–63.

Bryant, J., Claridge, M., Fursman, L., Jacobsen, V., & Jensen, B. (2004). *Theories of the family and policy* (New Zealand Treasury Working Paper 04/02). The Treasury.

Bumpass, L., & Lu, H. H. (2000). Trends in cohabitation and implications for children's family contexts in the United States. *Population Studies*, *54*, 29–41.

Casper, L. M. & Bianchi, S. M. (2002). *Continuity and change in the American family*. Sage.

Cavanagh, S. E. (2008). Family structure history and adolescent adjustment. *Journal of Family Issues*, *29*, 944–980.

Cavanagh, S. E., & Fomby, P. (2019). Family instability in the lives of American children. *Annual Review of Sociology*, *45*, 493–513.

Cavanagh, S. E., & Huston, A. C. (2008). The timing of family instability and children's social development. *Journal of Marriage and Family*, *70*, 1258–1270.

Clark, T., Robinson, E. Crengle, S., … & Saewyc, E. (2011). Risk and protective factors for suicide attempt among Indigenous Māori youth in New Zealand: The role of family connection. *Journal of Aboriginal Health*, 7, 16–31.

Commission on Social Determinants of Health (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health*. Final Report of the Commission on Social Determinants of Health. World Health Organization.

Cram, F. (2012*). Safety of subsequent children – Māori children and whānau. A review of selected literature.* Families Commission.

———— Measuring Māori children's wellbeing: A discussion paper. *MAI Journal*, *8*, 16–32.

Cross, C. (2020). Racial/ethnic differences in the association between family structure and children's education. *Journal of Marriage and Family, 82,* 691–712.

Czyzewski, K. (2011). Colonialism as a broader social determinant of health. *The International Indigenous Policy Journal*, *2*, 1–14.

Department of the Prime Minister and Cabinet (DPMC). 2019. *Child and Youth Wellbeing Strategy*. https://childyouthwellbeing.govt.nz/resources/child-and-youth-wellbeing-strategy

Dharmalingam, A., Pool, D. I., Sceats, J., & Mackay, R. (2004). *Patterns of family formation and change in New Zealand*. Centre for Social Research and Evaluation.

Dunn, J., Deater-Deckard, K., Pickering K., & O'Connor, T. G. (1998). Children's adjustment and prosocial behaviour in step-, single-parent, and non-stepfamily settings: Findings from a community study. *Journal of Child Psychology and Psychiatry*, *39*, 1083–1095.

Durie, M. (2003). *Nga kahui pou: Launching Māori futures*. Huia Publishers.

———— (1997). Māori cultural identity and its implications for mental health services. *International Journal of Mental Health, 26,* 23–35.

Fomby P., & Bosick, S. J. (2013). Family instability and the transition to adulthood. *Journal of Marriage and Family*, *75*, 1266–1287.

Fomby, P. & Cherlin, A. (2007). Family instability and child well-being. *American Sociological Review*, *72*, 181–204.

Fomby, P., Mollborn, S., & Sennott, C. A. (2010). Race/ethnic differences in effects of family instability on adolescents' risk behavior. *Journal of Marriage and Family*, *72*, 234–253.

Fowler, P. J., Henry, D. B., & Marcal, K. E. (2015). Family and housing instability: Longitudinal impact on adolescent emotional and behavioral well-being. *Social Science Research*, *53*, 364–374.

Härkönen, J., Bernardi, F., & Boertien, D. (2017). Family dynamics and child outcomes: Key findings and unresolved questions. *European Journal of Population*, *33*, 163–84.

Houkamau, C. A., & Sibley, C. G. (2011). Māori cultural efficacy and subjective wellbeing: A psychological model and research agenda. *Social Indicators Research*, *103*, 379–98.

Indigenous Health Group. (2007). *Social determinants and Indigenous health: The international experience and its policy implications.* Report on specially prepared documents and discussion at the International Symposium on the Social Determinants of Indigenous Health, Adelaide, for the Commission on Social Determinants of Health. Retrieved from www.who.int/social_determinants/resources/indigenous_health_adelaide_report_07.pdf

Jones, C. P. (2000). Levels of racism: A theoretical framework and a gardener's tale. *American Journal of Public Health, 90*, 1212–1215.

King, M., Smith, A., & Gracey, M. (2009). Indigenous health part 2: The underlying causes of the health gap. *The Lancet, 374*, 76–85.

Kiro, C., von Randow, M., & Sporle, A. (2010). *Trends in wellbeing for Māori households/families, 1981–2006*. Nga Pae o te Maramatanga.

Krieger, N. (2001). A glossary for social epidemiology. *Journal of Epidemiology & Community Health, 55*, 693–700.

Kukutai, T., Sporle, A. & Roskruge, M. (2015). *Whānau wellbeing. Families and Whānau Status Report 2015*. Social Policy Research and Evaluation Unit.

———— (2016). Expressions of whānau. In *Families and Whānau Status Report 2016*. Social Policy Research and Evaluation Unit.

Law Commission. (2017). *Relationships and families in contemporary New Zealand*. (NZLC Study Paper 22). Author.

Lawson-Te Aho, K. (2010). *Definitions of whānau: A review of selected literature*. The Families Commission.

Lesthaeghe R. (1995). *The second demographic transition in Western countries: An interpretation* (Interuniversity Programme of Development Working Paper 1991–2). Centrum Sociologie, Vrije Universiteit Brussel.

Lesthaeghe, R., & Moors, G. (2000). Recent trends in fertility and household formation in the industrialised world. *Review of Population and Social Policy, 9*, 121–170.

Lesthaeghe, R., & van de Kaa, D. J. (1986). Twee demografische transities? (Two demographic transitions?). In D. J. van de Kaa and R. Lesthaeghe (Eds.), *Bevolking: Groei en Krimp (Population: Growth and Decline)* (pp. 9–24). Van Loghum Slaterus.

Mackay, R. (2005). The impact of family structure and family change on child outcomes: A personal reading of the research literature. *Social Policy Journal of New Zealand, 24*, 111–34.

Marmot, M. (2010). *Fair society, healthy Lives: The Marmot Review*. Institute for Health Equity, University College London.

Martinez, R. O., & Dukes, R. L. (1997). The effects of ethnic identity, ethnicity, and gender on adolescent well-being. *Journal of Youth and Adolescence, 26*, 503–516.

McCubbin, L. D. (2006). The role of Indigenous family ethnic schema on well-being among Native Hawaiian families. *Contemporary Nursing, 23*, 170–180.

Moffitt, T., Poulton, R. & Caspi, A. (2013). Lifelong impact of early self-control: Childhood self-discipline predicts adult quality of life. *American Scientist, 101*, 352–359.

Morton, S. M. B., Atatoa Carr, P., Grant, C. C., ... & Wall, C. (2012). Cohort profile: Growing Up in New Zealand. *International Journal of Epidemiology, 42*, 65–75.

Morton, S. M. B., Ramke, J., Kinloch, J., Grant, C. C., Atatoa Carr, P., Leeson, H., Lee, A. C., & Robinson, E. (2015). Growing Up in New Zealand cohort alignment with all New Zealand births. *Australian and New Zealand Journal of Public Health, 39*, 82–7.

Nazroo, J. Y. (1999). The racialisation of ethnic inequalities in health. In D. Dorling & S. Simpson (Eds.), *Statistics in society: The arithmetic of politics* (pp. 215–222). Arnold.

Neblett, E. W., Rivas-Drake, D., & Umaña-Taylor, A. J. (2012). The promise of racial and ethnic protective factors in promoting ethnic minority youth development. *Child Development Perspectives, 6*, 295–303.

Phinney, J. S. (1992). The multigroup ethnic identity measure: A new scale for use with diverse groups. *Journal of Adolescent Research, 7*, 156–176.

Pitama, D., Ririnui, G., & Mikaere, A. (2002). *Guardianship, custody and access: Māori perspectives and experiences*. Ministry of Justice.

Putnam, S. P., & Rothbart, M. K. (2006). Development of short and very short forms of the children's behavior questionnaire. *Journal of Personality Assessment, 87*, 102–112.

Reid P., & Robson, B. (2007). Understanding health inequities. In B. Robson & R. Harris (Eds.), *Hauora: Māori Standards of Health IV. A study of the years 2000–2005* (pp. 3–10). Te Rōpū Rangahau Hauora a Eru Pōmare

Ritschard G., & Studer, M. (2018) Sequence analysis: Where are we, where are we going? In G. Ritschard & M. Studer (Eds.), *Sequence analysis and related approaches (Life course research and social policies)*. Springer.

Roberts, R. E., Phinney, J. S., Masse, L. C., Chen, Y. R., Roberts, C. R., & Romero, A. (1999). The structure of ethnic identity of young adolescents from diverse ethnocultural groups. *Journal of Early Adolescence, 19*, 301–322.

Ryan, R. M., Claessens, A., & Markowitz, A. J. (2015). Associations between family structure change and child behavior problems: The moderating effect of family income. *Child Development, 86*, 112–127.

Sarche, M., & Spicer, P. (2008) Poverty and health disparities for American Indian and Alaska Native children: Current knowledge and future prospects. *Annals of the New York Academy of Sciences, 1136*, 126–136.

Smith E., P., Walker, K., Fields, L., Brookins, C. C., & Seay, R. C. (1999). Ethnic identity and its relationship to self-esteem, perceived efficacy and prosocial attitudes in early adolescence. *Journal of Adolescence, 22*, 867–880.

Taskforce on Whānau-Centred Initiatives. (2010). *Report of the Taskforce on Whānau-Centred Initiatives*. Te Puni Kōkiri.

Te Mana Raraunga. (2018). *Māori data sovereignty principles*. https://www.temanararaunga.maori.nz/nga-rauemi

Utsey, S. O., Chae, M. H., Brown, C. F., & Kelly, D. (2002). Effect of ethnic group membership on ethnic identity, race-related stress, and quality of life. *Cultural Diversity and Ethnic Minority Psychology, 8*, 366–377.

van de Kaa, D. J. (1987). Europe's second demographic transition. *Population Bulletin, 42*, 1–59.

Waldfogel, J., Craigie, T. A., & Brooks-Gunn, J. (2010). Fragile families and child wellbeing. *The Future of Children, 20*, 87–112.

Walker, R. (2008). The philosophy of Te Whatu Pokeka: Kaupapa Māori assessment and learning exemplars. The first years: Ngā tau tuatahi. *New Zealand Journal of Infant and Toddler Education, 10,* 5–10.

Welfare Expert Advisory Group (WEAG). (2019). *Whakamana tāngata. Restoring dignity to social security in New Zealand.* Author. http://www.weag.govt.nz/weag-report/whakamana-tangata/

Webber, M. (2012). Identity matters: Racial-ethnic identity and Māori students. *Set: Research Information for Teachers, 2*, 20–27.

Williams, A. D., Clark, T. C., & Lewycka, S. (2018). The associations between cultural identity and mental health outcomes for Indigenous Māori youth in New Zealand. *Frontiers in Public Health, 6*.

Williams, D. R. (1997). Race and health: Basic questions, emerging directions. *Annals of Epidemiology, 7*, 322–333. https://doi.org/10.3389/fpubh.2018.00319

World Health Organization. (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health.* Author.

Wu, L. L., & Martinson, B. C. (1993). Family structure and the risk of a premarital birth. *American Sociological Review, 58*, 210–232.

Appendices

Table A1: Structural equation models predicting child outcomes at 54-month interview (n = 1349)

	Cognitive development		Negative affect	
	(1)	(2)	(1)	(2)
Family trajectory (ref: Stable two parents)				
Living with kin, late transition to mostly two parents	–1.230** (0.360)	–0.177 (0.369)	0.223*** (0.048)	0.111* (0.052)
Living with others with instability	–0.091 (0.692)	0.185 (0.672)	0.086 (0.094)	0.016 (0.095)
Sole parent with very late transition to living with others	–2.92*** (0.692)	–1.166† (0.669)	0.423*** (0.094)	0.277** (0.095)
Maternal characteristics				
Maternal education [a] (ref: Bachelor's or higher)				
No secondary school qual		–1.968** (0.570)		0.197* (0.080)
Secondary school/NCEA 1–4		–0.154 (0.454)		0.089 (0.065)
Diploma/trade cert./NCEA 5–6		–0.856* (0.426)		0.145* (0.060)
Age [a] (years)		0.100** (0.033)		–0.003 (0.004)
Employed [a]		–0.015 (0.349)		–0.024 (0.050)
Mother identifies as Māori		–0.878* (0.342)		0.142** (0.048)
Family characteristics				
Deprivation index [b] (0–6 scale)		–0.294* (0.117)		0.047** (0.016)
Number of siblings [a] (0–6+ scale)		–0.534*** (0.124)		–0.027 (0.018)
Residential moves since child's birth (0–4+ scale)		–0.023 (0.116)		0.013 (0.017)
Child characteristics				
Female [b]	2.173*** (0.335)	2.296*** (0.321)	0.074† (0.044)	0.075† (0.043)

	Cognitive development		Negative affect	
	(1)	(2)	(1)	(2)
Born at low birth weight [b] (<2500 g)	–2.410** (0.766)	–2.376** (0.733)	–0.062 (0.102)	–0.057 (0.101)
Developmental problem [b]	–0.249 (0.530)	–0.143 (0.507)	0.022 (0.073)	0.009 (0.072)
Child's age at 54-month interview	0.181† (0.102)	0.355*** (0.099)	0.025† (0.014)	0.011 (0.014)
Geographic characteristics				
Meshblock deprivation [a] (1–10 scale)		–0.251*** (0.062)		0.016† (0.009)
Rural area [a]		0.111 (0.621)		–0.131 (0.088)
District Health Board [b] (ref: Auckland)				
Counties Manukau		–0.430 (0.443)		0.019 (0.063)
Waikato		0.151 (0.437)		0.007 (0.062)
Elsewhere		–2.455** (0.839)		–0.045 (0.117)
Constant		2.827*** (0.742)		3.379*** (0.763)
Log likelihood	–24675.43	–43162.39	–6037.70	–24568.85
R2	0.082	0.218	0.031	0.071
RMSEA [90% CI lower and upper bounds]	0.066 [0.062, 0.071]	0.046 [0.042, 0.049]	n/a	n/a
CFI	0.721	0.723	n/a	n/a

Table A1 cont'd: Structural equation models predicting child outcomes at 54-month interview (n = 1349)

	Effortful control		Cultural connectedness	
	(1)	(2)	(1)	(2)
Family trajectory (ref: Stable two parents)				
Living with kin, late transition to mostly two parents	–0.069† (0.038)	–0.021 (0.042)	0.120* (0.05)	0.088 (0.057)
Living with others with instability	0.039 (0.075)	0.063 (0.076)	0.207* (0.103)	0.230* (0.104)
Sole parent with very late transition to living with others	–0.025 (0.074)	0.002 (0.076)	0.328** (0.105)	0.206* (0.105)
Maternal characteristics				
Maternal education [a] (ref: Bachelor's or higher)				
No secondary school qual		–0.045 (0.064)		–0.471*** (0.088)
Secondary school/NCEA 1–4		–0.018 (0.052)		–0.300*** (0.071)
Diploma/trade cert./NCEA 5–6		0.047 (0.048)		–0.202** (0.066)
Age [a] (years)		0.011** (0.004)		–0.013* (0.005)
Employed a		0.007 (0.040)		0.031 (0.054)
Mother identifies as Māori		0.044 (0.039)		0.316*** (0.053)
Family characteristics				
Deprivation index [b] (0–6 scale)		–0.018 (0.013)		0.013 (0.018)
Number of siblings [a] (0–6+ scale)		–0.007 (0.014)		0.040* (0.019)
Residential moves since child's birth (0–4+ scale)		0.010 (0.013)		-0.010 (0.018)
Child characteristics				
Female[b]	0.370*** (0.035)	0.374*** (0.035)	0.131** (0.049)	0.129** (0.047)
Born at low birth weight b (<2500 g)	0.034 (0.081)	0.023 (0.081)	–0.146 (0.114)	–0.114 (0.111)
Developmental problem [b]	–0.033 (0.058)	–0.023 (0.058)	0.163* (0.082)	0.183* (0.079)
Child's age at 54-month interview	0.020† (0.011)	0.025* (0.011)	0.035* (0.015)	0.037* (0.015)
Geographic characteristics				

	Effortful control		Cultural connectedness	
	(1)	(2)	(1)	(2)
Meshblock deprivation [a] (1–10 scale)		–0.002 (0.007)		0.030** (0.010)
Rural area [a]		–0.040 (0.070)		0.092 (0.096)
District Health Board [b] (ref: Auckland)				
Counties Manukau		0.007 (0.050)		–0.078 (0.069)
Waikato		0.025 (0.050)		0.124† (0.068)
Elsewhere		0.030 (0.094)		0.274* (0.128)
Constant		4.130*** (0.587)		3.541*** (0.612)
Log likelihood	–5721.710	–24270.940	–20319.760	–38827.178
R2	0.084	0.098	0.026	0.107
RMSEA [90% CI lower and upper bounds]	n/a	n/a	0.096 [0.091, 0.100]	0.670 [0.064, 0.070]
CFI	n/a	n/a	0.795	0.782

Notes: a Measured at antenatal; b Measured at 9-month interview. Standard errors in parentheses. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$. RMSEA = Root Mean Square Error of Approximation. CFI = Comparative Fit Index. n/a = Not applicable, fully saturated model.

Table A2: Path coefficients for models predicting child outcomes at 54-month interview via cultural connectedness (n = 1349)

	Outcome	Cultural connectedness	Indirect effect
	B [Confidence intervals]		B [Bootstrapped bias-corrected confidence intervals]
Cognitive			
Cultural connectedness	0.201 [–0.191, 0.592]	—	—
Family trajectory (ref: Stable two parents)			
Living with kin, late transition to mostly two parents	–0.195 [–0.917, 0.527]	0.088 [–0.024, 0.200]	0.018 [–0.011, 0.075]
Living with others with instability	0.143 [–1.175, 1.460]	0.231* [0.027, 0.443]	0.046 [–0.038, 0.163]
Sole parent with very late transition to living with others	–1.207† [–2.518, 0.105]	0.206* [0.001, 0.411]	0.041 [–0.023, 0.142]
Negative effect			
Cultural connectedness	–0.021 [–0.076, 0.034]	—	—
Family trajectory (ref: Stable two parents)			
Living with kin, late transition to mostly two parents	0.113* [0.010, 0.215]	0.088 [–0.024, 0.200]	–0.002 [–0.013, 0.001]
Living with others with instability	0.021 [–0.165, 0.207]	0.231* [0.027, 0.443]	–0.005 [–0.019, 0.003]
Sole parent with very late transition to living with others	0.281** [0.094, 0.468]	0.206* [0.001, 0.411]	–0.004 [–0.038, 0.002]
Effortful control			
Cultural connectedness	0.065** [0.021, 0.109]	—	—
Family trajectory (ref: Stable two parents)			
Living with kin, late transition to mostly two parents	–0.027 [–0.108, 0.055]	0.088 [–0.024, 0.200]	0.006 [–0.002, 0.014]
Living with others with instability	0.048 [–0.101, 0.197]	0.231* [0.027, 0.443]	–0.015[a] [0.001, 0.031]
Sole parent with very late transition to living with others	–0.011 [–0.161, 0.138]	0.206* [0.001, 0.411]	0.013[a] [0.000, 0.033]

Note: Analyses include full set of controls. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$. [a] Indirect effect significant at at least $p < 0.05$