



Parents' Interest in Their Child's Education and Children's Educational Outcomes across the Life Course: Does Gender Matter?

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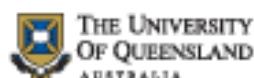
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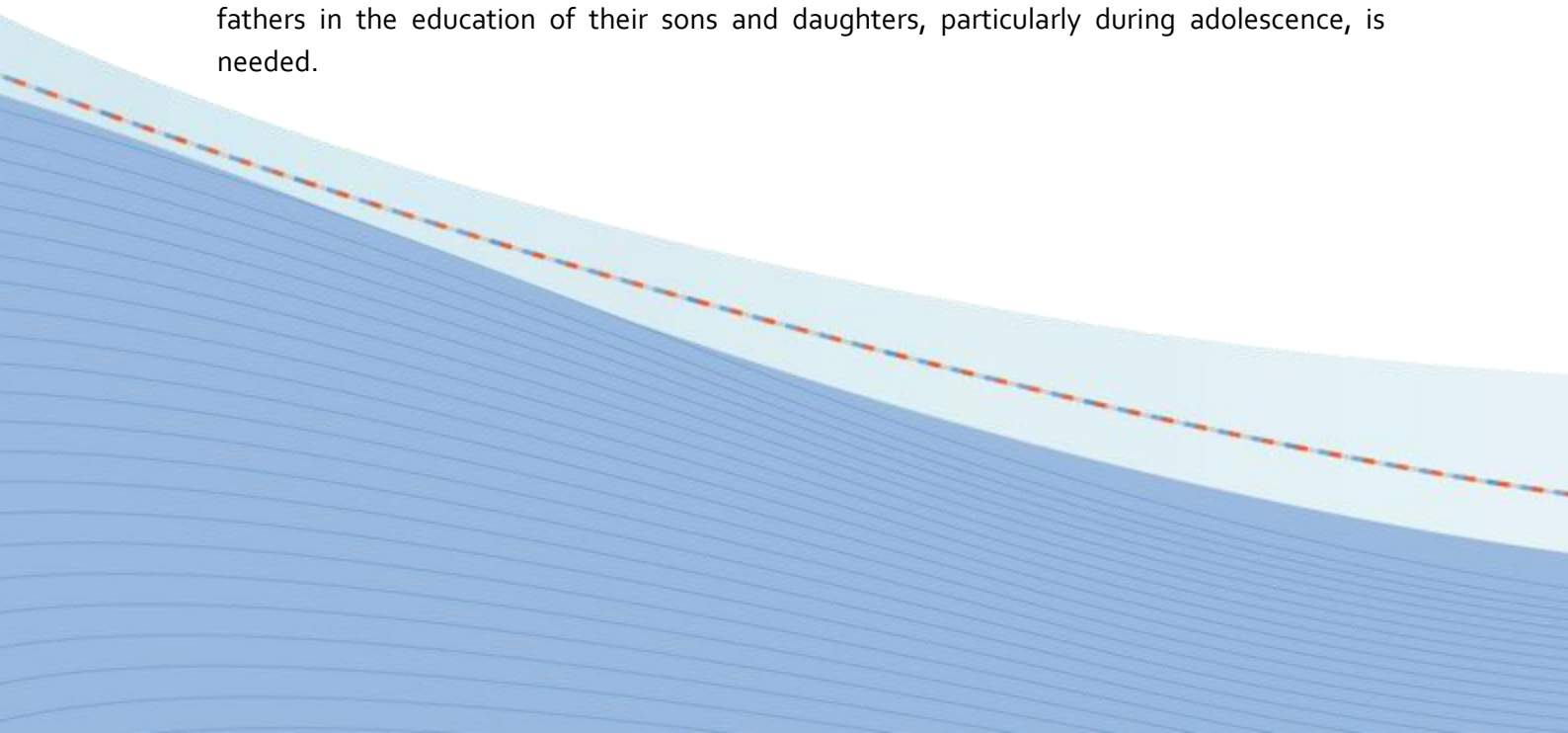
NON-TECHNICAL SUMMARY

When parents take an interest and engage with their child's learning and education, their children benefit in numerous ways. Parent engagement is known to be one mechanism in the transmission of educational advantage, and has recently become a focus for policy-makers in Australia and abroad seeking to reduce educational inequalities. However, there remain some glaring gaps in the parent engagement literature. One such gap concerns the potentially gendered nature of relationships between parent engagement and child outcomes.

We explored the role of gender in relationships between parents' interest in their child's learning and education and children's educational outcomes across the life course, using two waves of data from the study 'Growing Up in Australia: The Longitudinal Study of Australian Children'. Utilising adolescent children's reports we examine associations between parent interest and contemporaneous child outcomes including measures of academic achievement, self-evaluations and expectations for future educational attainment. Furthermore, using parents' retrospective reports regarding the interest shown by their own parents growing up, we examine longer-term associations between parent interest and educational attainment in adulthood.

With regards to short-term associations in adolescence, we find no significant relationships between parent interest and standardised test scores, and only small relationships between teacher-rated literacy abilities and the interest shown by the same-gender parent. The interest shown by both mothers and fathers have significant associations with the self-evaluations of boys and girls and, in turn, more positive self-evaluations are associated with increased odds of children expecting to attain a university qualification in the future. Furthermore, the perceived level of interest shown by fathers has a direct association with the educational expectations of daughters. As such, adolescent girls are significantly less likely to expect to attain a university qualification when they perceive their father as showing little or no interest compared to lots.

Our findings may be indicative that a small proportion of fathers continue to hold traditional gender-schemas that harm the life chances of their daughters. Further research on the role of fathers in the education of their sons and daughters, particularly during adolescence, is needed.



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Abstract

There has been a dearth of research exploring the potentially gendered nature of relationships between parent engagement and children's educational outcomes across the life course. In order to address this gap, this study drew upon data from the Longitudinal Study of Australian Children and utilised adolescents' reports of the interest shown by their parents in their learning and education as well as parents' retrospective reports of the interest shown by their own parents growing up. The interest shown by both mothers and fathers in their child's education during adolescence was found to be important for children's self-evaluations and, via these, their expectations for future educational attainment. Furthermore, when fathers were perceived as showing little to no interest in the education of their adolescent daughters, as opposed to lots, their daughters were significantly less likely to expect to attain a university qualification in the future. While further research is needed, these findings suggest that fathers' engagement is important for fostering high educational expectations in adolescent girls.

Keywords: Parent engagement; educational outcomes; gender; LSAC

1 Introduction

The benefits of education for individuals' outcomes across the life course are numerous and well documented (Hatch, Feinstein, Link, Wadsworth, & Richards, 2007; OECD, 2013). Also well documented is the persistence of educational trajectories within families (Hill & O'Neill, 1994; Minello & Blossfeld, 2016; Hancock, Mitrou, Povey, Campbell & Zubrick, 2016). Understanding the mechanisms through which educational advantage is transmitted can inform interventions aimed at closing persistent gaps in child outcomes. Strong evidence has accumulated over the past three decades for parent engagement as a mechanism in the transmission of educational advantage and, as such, a potential means for overcoming disadvantage (Benner, Boyle, & Sadler, 2016; Hango, 2007; Sime & Sheridan, 2014). With Governments around the world attempting to increase levels of parent engagement in a bid to reduce educational inequalities (Council of Australian Governments, 2013; U.S. Department of Education, 2016), it is important that a thorough understanding of the subtle variations in the relationship between parent engagement and child outcomes are examined and understood. In this paper we define 'parent engagement' in the broadest terms as the attitudes, values and behaviours of parents that promote their child's learning and educational outcomes. Such a broad definition encompasses a number of related constructs in the literature, including parent involvement, academic socialisation and concerted cultivation, and is consistent with the Australian Government's definition (Department of Education and Training, 2015).

Despite the impressive accumulation of evidence on parent engagement some gaps in our knowledge remain. In particular, there has been scant research looking at the impact of parent engagement across different gender combinations of parent and child. This is an important gap to address given that maternal and paternal interactions with sons and daughters may differ due to traditional gender schemas and gender role socialisation (Hango, 2007). As a result, mothers' and fathers' engagement in their child's education may have different effects on the outcomes of sons versus daughters. If such gendered effects do exist then they need to be better understood. However, very few studies have attempted to address this question. Grolnick & Slowiaczek (1994) ran correlations between mothers' and fathers' engagement and a range of child outcomes for boys and girls separately but found no obvious differences in the results, so collapsed child gender in their full models. However, their sample was relatively small and this may have limited their ability to detect gendered effects. Small sample size

prevented Kaplan Toren & Seginer (2015) from running separate models for boys and girls in their study, however they noted the importance of future research doing so.

Utilising a larger sample size typical of national cohort studies, Flouri (2006) examined the effects of teacher-rated mother and father interest in their child's education at age ten on the educational attainment of sons and daughters at age twenty-six. Flouri found that mothers' interest positively predicted the educational attainment of both boys and girls, whereas fathers' interest was a significant predictor for girls only. Flouri hypothesised that the fathers who showed low levels of interest in their daughters' education may have been those with more traditional gender schemas. In turn, their daughters may have had more gender-typed cognitions about themselves, leading them to attain lower levels of education in adulthood. In partial support of this hypothesis, it was recently observed that fathers' implicit gender-role associations were significantly related to the occupational aspirations of their daughters but not sons (Croft, Schmader, Block, & Baron, 2014). Taken together these results suggest the need for further research into the distinct effects of maternal and paternal engagement on sons versus daughters.

The aim of this research is to investigate the potentially gendered nature of relationships between children's outcomes and one measure of parent engagement, namely child perceptions of parents' interest in their learning and education. Using data from the Longitudinal Study of Australian Children (LSAC), we utilise adolescents' reports of the interest shown by their mothers and fathers, as well as mothers' and fathers' retrospective reports of the interest shown by their own parents growing up. Doing so enables us to examine longer-term associations (that is, how grandmothers' and grandfathers' interest relates to the adult educational attainment of mothers and fathers) and short-term associations (that is, how mothers' and fathers' interest relates to a variety of outcomes in adolescent sons and daughters). While it is acknowledged that parent interest does not capture every possible dimension of parent engagement, strengths of this measure include its ability to capture a range of different subtle and overt parent engagement behaviours, and the fact that it does so from the perspective of the child.

2 Literature Review

2.1 Parent interest as a measure of parent engagement

Measures of parent interest have been utilised in previous research investigating the relationship between parental investments and child educational outcomes (Flouri, 2006;

Hango, 2007). It is important to conceptualise what such measures might be capturing, and how they fit within the broader parent engagement literature. Parents may engage in their child's learning and education in a variety of ways at home, in the community and at school (see Fox & Olsen, 2014, for a comprehensive review). As Jeynes (2011) correctly pointed out, parent engagement has most commonly been measured via overt parent behaviours, including participation in school functions and helping with homework. Yet, the forms of parent engagement found to have the greatest impact on child outcomes are those that could be considered the most subtle: primarily high parental expectations and parent-child conversations about school activities and plans for the future (Jeynes, 2005; Jeynes, 2007; Porumbu & Necşoi, 2013). A strength of measuring parent engagement via child reports of parents' interest is the potential to capture a range of engagement behaviours, including the more subtle ones previously found to be the most effective. Furthermore, parent interest is likely to be less sensitive to the effects of a child's previous academic achievement than overt behaviours such as 'helping with homework' would be, given that parents may reduce these behaviours when their child is self-motivated and already achieving highly but are arguably less likely to cease showing interest altogether. A further advantage of this measure is that it captures the perceptions of the child.

The perspectives of children are a notable omission from the majority of previous research on parent engagement (for exceptions see Gordon, 2016; McCarron & Inkelas, 2006; Hill et al., 2004; Kaplan Toren, 2013). More often than not parent engagement has been measured by self-reports of parent behaviour, and teacher reports of parent interest have also been used (Flouri, 2006; Hango, 2007). Yet when we consider the ways in which parent engagement is theorised to impact on child outcomes, the importance of the child's perspective becomes clear. One of the key channels through which parent engagement is believed to influence children is the communication of parental values – specifically, that the parent values their child's learning and educational outcomes (Gniewosz & Noack, 2011; Gonzalez-DeHass, Willems, & Holbein, 2005; Hango, 2007). However, children must experience their parents' behaviours before they can interpret them (Grolnick & Slowiaczek, 1994) and furthermore, they may not always interpret them in the expected way. For example, frequent discussions about future plans may feel to adolescents like unnecessary interference, undermining their sense of autonomy and competence.

Indeed, Gecas & Schwalbe (1986) found only modest agreement between parents' reports of their behaviours and adolescent children's perceptions of these behaviours.

Gniewosz & Noack (2011) found that children's perceptions of their parents' behaviours and values mediated the relationship between parent and child academic values. Likewise, Marchant, Paulson, & Rothlisberg (2001) found that children's perceptions of their parents' values regarding the importance of education were the most important predictor – over and above parent engagement behaviours - of children's academic motivations, perceived school competence and, via these constructs, academic achievement. Given this evidence, we choose to utilise child reports of parents' interest in this study as the best available proxy for the child's perceptions of their parents' behaviours and values. Furthermore, we assess a range of child outcomes in order to gain a more complete picture of the effects of parent engagement across the life course.

2.2 *Educational outcomes across the life course*

For researchers and policymakers interested in persistent educational inequalities across the life course the outcomes of interest are numerous. Children's educational outcomes can be thought of as either proximal, which includes measures of cognitive ability, school readiness, and academic achievement; or distal, which includes the attainment of educational qualifications in adulthood. As would be expected, the two types of outcome tend to be highly correlated. However, it would be erroneous to assume that school achievement is the only important predictor of an individual's ultimate level of educational attainment. This is especially so for children from educationally disadvantaged backgrounds, who not only tend to have lower levels of school achievement than their more advantaged peers but who also, given a comparable level of academic achievement, are significantly less likely to expect that they will complete post-secondary qualifications (Yu & Daraganova, 2015). Even when these children do hold high expectations, they are less likely to maintain these expectations into adulthood and realise them (Johnson & Reynolds, 2013; Reynolds & Johnson, 2011).

Thus it is of interest to look at a range of child outcomes that are theoretically related both to parent engagement and to educational outcomes (proximal and distal). One set of distinct but closely related concepts are self-evaluations. They include measures of self-efficacy, self-concept and self-perceived competence and control (Gonzalez-DeHass et al., 2005; Grolnick & Slowiaczek, 1994; Rogers, Theule, Ryan, Adams, & Keating, 2009). A comprehensive review of the similarities and differences between these theoretical constructs is beyond the scope of this paper. Nevertheless, similar mechanisms are likely to operate in the positive relationships researchers have found between levels of parent engagement and one or

more of these forms of self-evaluation in children (Carolan, 2015; Fan & Williams, 2010; Kaplan Toren, 2013; Marchant et al., 2001; Topor, Keane, Shelton, & Calkins, 2010).

An individual's self-evaluations are subject to numerous sources of influence, and it is easy to see the role that parents might play in some of these. For example, drawing on Bandura's (1997) conceptualisation of self-efficacy, we can imagine that parents who are highly engaged with their child's learning are likely to increase their child's positive self-evaluations by facilitating academic mastery experiences. This could include encouraging and supporting them to complete a homework assignment to the best of their ability, or enrolling them in extra-curricular activities. Engaged parents are more likely to also be an important source of social persuasion, providing positive feedback to their child about their ability to apply themselves to their schoolwork, take on new challenges and learn new things. Of course, a child's prior achievement is an important source of information for their self-evaluations, however, there is strong evidence that this relationship is reciprocal and that the confidence children gain from positive self-evaluations leads to increases in academic achievement in the short-term (Kaplan Toren & Seginer, 2015; Marsh & Martin, 2011).

In addition, self-evaluations appear to be related to distal educational outcomes. For example, positive self-concept in adolescence has been found to predict higher levels of educational attainment ten years later, over and above the effects of prior academic achievement (Guay, Larose, & Boivin, 2004). Eccles (1987) proposed that positive self-evaluations in the form of academic self-concept enhance children's expectations of future success, and it is therefore possible that parent engagement might increase not only children's positive self-evaluations, but also their expected future attainment of educational qualifications. By looking at a range of cognitive, behavioural and emotional outcomes, both proximal and distal, researchers can gain a more complete picture of the impact of parent engagement on their child's educational outcomes across the life course.

2.3 *The current study*

A synthesis of the research has indicated the need to investigate the role gender plays in relationships between parent engagement and child outcomes. To address this gap, this research investigated the gendered nature of relationships between grandparents' interest and the distal outcome of parent level of educational attainment in adulthood, and parents' interest and a range of proximal adolescent outcomes. These adolescent outcomes include standardised test scores, teacher ratings of academic abilities, efficacy-related self-concept and children's

expectations for their future educational attainment. To prevent confusion, members of the same family will be referred to in the following terms for the remainder of this paper: The study child's grandparents will be referred to as grandparents/grandmothers/grandfathers; the study child's parents will be referred to as parents/mothers/fathers; and the study children will be referred to as children/daughters/sons.

The research presented here will be guided by two questions:

1. *Are there gender-specific relationships between grandparents' interest in parents' education and the level of education attained by parents in adulthood?*
2. *Are there gender-specific relationships between parents' interest in their adolescent child's education and contemporaneous child outcomes?*

As Wang, Hill and Hofkens (2014) pointed out, the vast majority of previous research has treated parent engagement as a *static* predictor of adolescent outcomes by using a measure of parent engagement at a single time point to predict child outcomes at a later time point. This ignores the rapid development that adolescents undergo and the potentially variable nature of parent-child relationships during this time. Thus, in order to answer the second research question, the current study utilises panel regression methods on two waves of available data to assess the dynamic relationships between parent interest and adolescent outcomes.

3 Method

3.1 The Longitudinal Study of Australian Children

This study uses data from the Longitudinal Study of Australian Children (LSAC). LSAC is a dual-cohort study of a nationally representative sample of Australian children. When data collection commenced in 2004 the Kindergarten (K) cohort were 4 -5 years old, and the Birth (B) cohort were 0-1 years old. Data has since been collected every 2 years, with the most recent wave of available data (wave 6) collected in 2014.

Children who were present on the Medicare Australia enrolment database – which constitutes approximately 98% of Australian children by 12 months of age - were randomly selected into LSAC via a two-stage process (Soloff, Lawrence, & Johnstone, 2005). Postcodes were randomly selected first, then children living within each postcode. Initial response rates for both cohorts were around 50%, and just over 10,000 children were ultimately recruited into LSAC: 4,983 for the K-cohort and 5,107 for the B-cohort. Whilst broadly representative of the

Australian populations of children born at the same time, children from non-English speaking families, single-parent households, rented homes and those living in remote areas were all somewhat under-represented at wave 1, and became more so over subsequent waves due to disproportional rates of attrition (Australian Institute for Family Studies, 2015).

In LSAC the child is the primary unit of analysis, and data is collected for each child from a range of different sources. These include in-home interviews conducted with the child's primary caregiver as well as questionnaires completed by both of the child's parents (including, when applicable, parents living elsewhere), teachers/childcare workers and, once old enough, the study child. Interviewers also undertake direct assessments of the child, including physical measurements and non-verbal intelligence tests. Where permission was given, children's LSAC data was linked to data held in government administrative databases, including, for example, the child's results in the National Assessment Program – Literacy And Numeracy (NAPLAN).

3.2 *Sample*

This study is based on data obtained from the K-cohort at waves 5 and 6, when the study children were 12-13 and 14-15 years old respectively. These were the first waves in which children were asked about the level of interest shown by their parents in their education, and these questions were only asked of K-cohort. In total 3,956 K-cohort children participated in wave 5 (2,020 boys and 1,936 girls), and 3,537 participated in wave 6 (1,798 boys 1,739 girls), with 4,003 children participating in at least one of these waves. This comprised our initial sampling frame. However, not all variables used in our models were available for all children, further reducing the numbers available for analysis.

For the models predicting child outcomes (that is, those associated with research question 2 above), the same subsample of children were used in each model to allow for comparisons. As such, the subsample comprised children with at least one wave of data without any missing values on any of the model variables. This subsample comprised 2,498 children (1,217 boys 1,281 girls), meaning that 1,535 children (853 boys 682 girls) did not contribute data to any of the models predicting child outcomes. The main reasons that children were absent from the child outcome models included failure to obtain consent to link NAPLAN results to LSAC data, teachers not returning questionnaires and, for children whose primary father figure lived outside the family home, failure of some of these fathers to participate in the survey (meaning no data on their level of education was available). Analyses were conducted

comparing the participating subsample to the non-participating subsample of children on the parent interest and child outcome variables (where data were available). The non-participating subsample were found to be significantly more disadvantaged in every way. They reported lower levels of parent interest in their education, lower self-concept, and had lower NAPLAN and ARS scores (see Appendix: Table A1, for more details).

3.3 Measures

Interest in education. In wave 5, mothers and fathers were asked the following questions regarding grandmothers and grandfathers, ‘When you were growing up, how much interest did your mother (father) show towards your learning and education?’ Possible responses were ‘a lot’, ‘some’, ‘not much’, and ‘none at all’. The last two responses were collapsed into a single category ‘not much/none’ due to small cell sizes. In waves 5 and 6, children were asked, ‘How much interest does your mother (father) show towards your learning and education?’ Response options were the same as those listed above, and again the last two responses were collapsed into a single category ‘not much/none’. Children were able to choose to answer this question regarding mother/fathers living inside or outside the family home.

Grandparents’ and parents’ level of educational attainment. In wave 5, mothers and fathers were asked to report the highest level of education grandparents had achieved by the time parents were 14 years of age. Five categories of grandparent education that were deemed to appropriately represent the distribution of qualifications in that generation were created. These were: grade 9 or less, grade 10, grade 11 or 12, vocational qualification and university qualification. Five categories of parental education were created based upon whether or not parents had completed secondary school (i.e. grade 12) and had any post-secondary qualifications. These categories differed from the grandparent education categories in such a way to reflect overall increases in the attainment of educational qualifications across the two generations. The categories were as follows: less than grade 12 with no post-secondary qualification, less than grade 12 with a post-secondary qualification, grade 12 with no post-secondary qualification, grade 12 with a vocational qualification, and grade 12 with a university qualification.

Academic achievement. In the majority of cases permission was given for the study child’s NAPLAN results to be linked to their LSAC data. NAPLAN is the national program of standardised testing for school children in Australia. Children sit NAPLAN in grades 3, 5, 7 and 9, and it comprises 5 separate tests: reading, writing, spelling, grammar and numeracy. In

this study the child's grade 7 and grade 9 reading and numeracy test results were used as outcomes, which broadly corresponds with child age at wave 5 and 6 respectively. NAPLAN scores were standardised by wave to allow for ease of interpretation and comparison across test domains.

Academic outcomes were also measured using teacher ratings. At waves 5 and 6 the child's English teacher was asked to complete an assessment of the child's literacy abilities using a version of the Academic Rating Scale (ARS) - language and literacy subtest, developed for use in the Early Childhood Longitudinal Study (ECLS-K) and adapted for use in Australian schools (Rothman, 2009). Teachers were asked to rate the extent to which the study child displayed a range of skills, with a detailed description for each skill provided. The skills assessed included, 'Understands and interprets a story or other text read aloud', and 'Composes multi-paragraph stories/reports with an understandable beginning, middle and end.' Possible responses ranged from 1 (not yet) to 5 (proficient). Index scores were created by taking the mean of all items. The ARS showed good internal reliability in the current study ($\alpha=.96$). ARS scores were standardised by wave to facilitate easy comparison with other outcomes.

For all models in which academic achievement was the outcome, a prior measure of the child's underlying cognitive ability was included as a control. This was in the form of the child's score on the matrix reasoning subtest of the Wechsler Intelligence Scale for Children (WISC – IV: Weschler, 2003), collected at wave 4 when the children were 10-11 years old.

Efficacy-related self-concept. Study children were asked to respond to 5 items measuring their efficacy-related self-concept in waves 5 and 6. The items were a small selection drawn from the much larger Marsh Self-Description Questionnaire II (Marsh, 1990). Sample items include, 'Most things I do, I do well' and, 'If I really try, I can do almost anything I want to.' While these items differ conceptually from measures of *academic* self-concept, which relate specifically to the individual's evaluations of their academic abilities, these items also differ conceptually from those commonly used to measure *global* self-concept. For example, they do not include evaluations of the child's social standing or physical traits. Nor could they be considered a measure of self-efficacy as this is always task- or situation-specific. However, as the items all relate to the child's ability to *do* and *achieve*, albeit generally, we label this construct efficacy-related self-concept. Responses to these 5 items were measured on a scale of 1(False) to 5(True). An index was created by taking the mean of all items, with higher scores on the index representing a more positive self-concept. Items loaded well on a single factor (all

loadings greater than .73), and the index showed good internal reliability ($\alpha=.87$). Scores on the self-concept index were standardised by wave to facilitate comparison with other child outcomes.

Expectations for future educational attainment. In waves 5 and 6, children were asked how far they expected to go in their education using an item adapted from the Early Childhood Longitudinal Study (ECLS-K:2007), Grade 8: Student Questionnaire; and the Educational Longitudinal Study (ELS) (2002). Response options included, 'Leave school before finishing secondary school', 'Complete secondary school', 'Complete a trade or vocational training course', and 'Complete a university degree'. To reflect changing norms surrounding educational attainment in an Australian context, observable in the rapid growth in the proportion of young people undertaking a university education, the first three responses to this item were collapsed to create a binary variable for whether or not the child expected to attain a university qualification.

Demographic variables. The child's age at the time the outcome was measured (that is, their age at the time of the interview or of NAPLAN testing) was included in the models predicting child outcomes. When parent education was the outcome the parent's age was used instead. Demographic factors known to be related to socio-economic status within an Australian context were also used as controls. These included a dichotomous measures of indigeneity, coming from a home in which a language other than English is spoken, and living in a home that is rented. In the models for which child outcomes were regressed on mother/father interest, dummy variables for whether the child's nominated mother/father figure lived outside the family home were also included.

3.4 Analytic strategy

The relationships between grandparents' level of interest in the education of mothers and fathers and mothers' and fathers' level of educational attainment at time point one (wave 5) were assessed using a multinomial logistic regression with 'grade 12 with a university qualification' as the reference category. Data pertaining to mothers and fathers were analysed separately. Given the rapid changes and development that children go through in early adolescence, and the potentially variable nature of parent-child relationships during this time, responses from both waves 5 and 6 were used in the models predicting child outcomes from parents' interest. Panel regression methods with random effects were the analytic strategy of choice, as this utilises both the within-individual (change in individuals over time) and

between-individual variance in estimating the associations between the outcome and explanatory variables. Furthermore, random effects models allow for the calculation of coefficients for time-invariant explanatory variables of interest. For the continuous outcome variables (that is, NAPLAN scores, teacher rating of academic ability, and self-concept) standard panel regression with random effects was used. For the models predicting boys' and girls' expectations for attaining a university qualification logistic panel regression models with random effects were used. The results of all analyses are presented below, in the order corresponding to the research questions stated above.

4 Results

Are there gender-specific relationships between grandparents' interest in parents' education and the level of education attained by parents in adulthood?

Descriptive analyses were performed to explore the bivariate relationship between grandparents' level of education and the level of interest they were perceived to have shown in parents' education growing up (see Appendix: Table A2). Cross-tabulations showed a significant association between grandmothers' level of education and the level of interest that they showed in the education of mothers (χ^2 (8, N = 3,198) = 205.41, $p < .001$) and fathers (χ^2 (8, N = 2,000) = 148.97, $p < .001$). Grandfathers' level of education was also found to be significantly associated with the level of interest they had showed in the education of mothers (χ^2 (8, N = 3,198) = 248.18, $p < .001$) and fathers (χ^2 (8, N = 2,000) = 160.03, $p < .001$) when they were growing up. As would be expected from previous research, more highly educated grandparents were more likely to be perceived as having shown lots of interest in mothers' and fathers' education growing up, and less likely to be perceived as having shown little to no interest.

Multinomial logistic regression models were run separately for mothers (Table 1) and fathers (Table 2), predicting their level of educational attainment at wave 5 from grandparents' level of education and retrospective reports of their interest in parents' education growing up. The model for mothers shows that both grandmothers' and grandfathers' level of education were significantly related to the level of education attained by mothers, such that higher levels of grandparent education were associated with higher levels of educational attainment in mothers. Furthermore, grandmother and grandfather interest were also found to be significantly related to mothers' levels of educational attainment controlling for grandparents' level of education. Grandparents showing anything less than lots of interest significantly increased the

relative risk of mothers not completing grade 12 compared with completing grade 12 and obtaining a university education. Furthermore, grandparents specifically showing little or no interest, compared with showing lots, significantly increased the relative risk that mothers would obtain a lower level of education compared with ‘grade 12 and a university qualification’.

With regards to fathers (see Table 2), both grandmothers’ and grandfathers’ level of education were significantly related to fathers’ level of obtained education, such that higher levels of grandparent education were associated with higher levels of educational attainment in fathers. Levels of grandmother and grandfather interest were also found to have some significant associations with fathers’ educational attainment, controlling for grandparent education, although the pattern of these relationships differed somewhat. Grandfather interest appeared to have an impact on whether or not fathers completed grade 12, with the relative risk of fathers not completing grade 12 compared to completing grade 12 and obtaining a university qualification expected to increase by over 2 times when grandfathers showed little or no interest as opposed to lots. On the other hand, grandmother interest appeared to be more important in differentiating the subsequent pathways of fathers who had completed grade 12, with the relative risk of fathers completing grade 12 with either a vocational qualification or no post-secondary qualification (compared to a university qualification) expected to increase by approximately 2 times when grandmothers showed little or no interest as opposed to lots.

Table 1. Results of multinomial logistic regression models showing the relative risk ratios for different educational attainment outcomes in mothers at wave 5 (with “Grade 12 with university qualifications” as the comparison outcome) based on maternal grandparents’ level of education and interest in mother’s education growing up

| | Mother’s Educational Attainment | | | | | | | | |
|---|--------------------------------------|----------------|---|---------------|--------------------------------------|----------------|--|---------------|---|
| | Less than Grade 12 | | Less than Grade 12 with post-school qualification | | Grade 12 | | Grade 12 with non-university post-school qualification | | Grade 12 with university qualification (<i>reference</i>) |
| | <i>N</i> (%) | RRR(se) | <i>N</i> (%) | RRR(se) | <i>N</i> (%) | RRR(se) | <i>N</i> (%) | RRR(se) | <i>N</i> (%) |
| Maternal Grandmother Interest | | | | | | | | | |
| No/Not much | 89 (27%) | 2.15 (.44)*** | 173 (24%) | 2.21 (.36)*** | 66 (20%) | 1.74 (.36)** | 125 (18%) | 1.56 (.26)** | 110 (10%) |
| Some | 104 (32%) | 1.40 (.24)* | 244 (34%) | 1.58 (.20)*** | 90 (27%) | 1.08 (.18) | 200 (28%) | 1.20 (.15) | 269 (24%) |
| Lots (<i>reference</i>) | 136 (41%) | | 309 (42%) | | 176 (53%) | | 377 (54%) | | 730 (66%) |
| Maternal Grandfather Interest | | | | | | | | | |
| No/Not much | 132 (40%) | 2.30 (.46)*** | 258 (36%) | 1.80 (.27)*** | 96 (29%) | 1.61 (.31)* | 202 (29%) | 1.50 (.23)** | 195 (18%) |
| Some | 115 (35%) | 1.47 (.26)* | 257 (35%) | 1.27 (.17) | 120 (36%) | 1.35 (.22) | 232 (33%) | 1.12 (.14) | 348 (31%) |
| Lots (<i>reference</i>) | 82 (25%) | | 211 (29%) | | 116 (35%) | | 268 (38%) | | 566 (51%) |
| Maternal Grandmother Education | | | | | | | | | |
| Grade 9 or less | 137 (42%) | 4.06 (1.45)*** | 254 (35%) | 3.10 (.74)*** | 84 (25%) | 3.51 (1.14)*** | 199 (28%) | 2.09 (.45)*** | 224 (20%) |
| Grade 10 | 97 (29%) | 2.67 (.94)** | 242 (33%) | 2.80 (.65)*** | 115 (35%) | 3.75 (1.17)*** | 182 (26%) | 1.84 (.39)** | 254 (23%) |
| Grade 11 or 12 | 52 (16%) | 2.64 (.96)** | 104 (14%) | 1.87 (.46)* | 71 (21%) | 3.40 (1.08)*** | 139 (20%) | 2.01 (.43)*** | 194 (17%) |
| Vocational qualification | 32 (10%) | 1.21 (.45) | 95 (13%) | 1.25 (.30) | 47 (14%) | 1.76 (.57) | 137 (20%) | 1.48 (.31) | 270 (24%) |
| University qualification (<i>reference</i>) | 11 (3%) | | 31 (4%) | | 15 (5%) | | 45 (6%) | | 167 (15%) |
| Maternal Grandfather Education | | | | | | | | | |
| Grade 9 or less | 134 (41%) | 3.39 (.96)*** | 246 (34%) | 2.84 (.57)*** | 82 (25%) | 1.32 (.31) | 186 (27%) | 2.08 (.39)*** | 219 (20%) |
| Grade 10 | 80 (24%) | 3.58 (1.04)*** | 123 (17%) | 2.17 (.46)*** | 71 (21%) | 1.54 (.37) | 118 (17%) | 2.06 (.40)*** | 154 (14%) |
| Grade 11 or 12 | 29 (9%) | 1.58 (.51) | 82 (11%) | 1.96 (.43)** | 45 (14%) | 1.22 (.30) | 90 (13%) | 1.71 (.34)** | 148 (13%) |
| Vocational qualification | 66 (20%) | 1.69 (.48) | 224 (31%) | 2.39 (.45)*** | 91 (27%) | 1.22 (.26) | 235 (33%) | 2.16 (.36)*** | 316 (28%) |
| University qualification (<i>reference</i>) | 20 (6%) | | 51 (7%) | | 43 (13%) | | 73 (10%) | | 272 (25%) |
| Control Variables | | | | | | | | | |
| Mother language other than English (Y) | 40 (12%) | .84 (.18) | 65 (9%) | .66 (.11)* | 30 (9%) | .74 (.17) | 105 (15%) | 1.27 (.19) | 146 (13%) |
| Mother is Indigenous (Y) | 7 (2%) | 1.90 (1.03) | 23 (3%) | 2.84 (1.22)* | 0 (0%) | 0.00 (.00) | 15 (2%) | 2.15 (.97) | 8 (<1%) |
| Mother’s age in years | <i>M</i> = 43.79 <i>SD</i> = 5.35 | .96 (.01)*** | <i>M</i> = 43.35 <i>SD</i> = 5.27 | .94 (.01)*** | <i>M</i> = 42.60 <i>SD</i> = 4.53 | .91 (.01)*** | <i>M</i> = 43.37 <i>SD</i> = 5.11 | .94 (.01)*** | <i>M</i> = 44.74 <i>SD</i> = 4.36 |
| Model Summary Statistics | | | | | | | | | |
| <i>N</i> | | 3,198 | | | | | | | |
| <i>LR chi</i> ² | | 565.66*** | | | | | | | |
| <i>df</i> | | 60 | | | | | | | |

* p<.05; ** p<.01; *** p<.001

Table 2. Results of multinomial logistic regression models showing the relative risk ratios for different educational attainment outcomes in fathers at wave 5 (with “Grade 12 with university qualifications” as the comparison base outcome) based on paternal grandparents’ level of education and interest in father’s education growing up

| | Father’s Educational Attainment | | | | | | | | |
|---|--------------------------------------|------------------|---|------------------|--------------------------------------|------------------|--|------------------|---|
| | Less than Grade 12 | | Less than Grade 12 with post-school qualification | | Grade 12 | | Grade 12 with non-university post-school qualification | | Grade 12 with university qualification (<i>reference</i>) |
| | <i>N</i> (%) | RRR(<i>se</i>) | <i>N</i> (%) | RRR(<i>se</i>) | <i>N</i> (%) | RRR(<i>se</i>) | <i>N</i> (%) | RRR(<i>se</i>) | <i>N</i> (%) |
| Paternal Grandmother Interest | | | | | | | | | |
| No/Not much | 52 (32%) | 1.73 (.50) | 115 (19%) | 1.11 (.23) | 22 (16%) | 2.10 (.73)* | 74 (20%) | 1.83 (.42)** | 75 (10%) |
| Some | 57 (34%) | .96 (.23) | 225 (37%) | .87 (.13) | 51 (38%) | 1.22 (.29) | 133 (35%) | 1.16 (.19) | 239 (33%) |
| Lots (<i>reference</i>) | 57 (34%) | | 265 (44%) | | 61 (46%) | | 167 (45%) | | 407 (57%) |
| Paternal Grandfather Interest | | | | | | | | | |
| No/Not much | 84 (51%) | 2.39 (.72)** | 230 (38%) | 2.10 (.40)*** | 28 (21%) | .65 (.22) | 128 (34%) | 1.20 (.25) | 171 (24%) |
| Some | 54 (33%) | 1.55 (.44) | 256 (42%) | 1.87 (.31)*** | 67 (50%) | 1.41 (.36) | 137 (37%) | 1.07 (.19) | 265 (37%) |
| Lots (<i>reference</i>) | 28 (17%) | | 119 (20%) | | 39 (29%) | | 109 (29%) | | 285 (39%) |
| Paternal Grandmother Education | | | | | | | | | |
| Grade 9 or less | 74 (45%) | 2.93 (1.59)* | 192 (32%) | 2.84 (.86)*** | 34 (26%) | 1.52 (.68) | 87 (23%) | 1.74 (.55) | 151 (21%) |
| Grade 10 | 53 (32%) | 2.57 (1.36) | 230 (38%) | 3.14 (.89)*** | 39 (29%) | 1.44 (.60) | 112 (30%) | 2.22 (.65)** | 146 (20%) |
| Grade 11 or 12 | 22 (13%) | 1.84 (1.00) | 94 (15%) | 1.88 (.55)* | 35 (26%) | 1.58 (.64) | 83 (22%) | 1.78 (.52)* | 141 (20%) |
| Vocational qualification | 12 (7%) | .88 (.50) | 66 (11%) | .98 (.29) | 15 (11%) | .62 (.27) | 69 (19%) | 1.32 (.38) | 180 (25%) |
| University qualification (<i>reference</i>) | 5 (3%) | | 23 (4%) | | 11 (8%) | | 23 (6%) | | 103 (14%) |
| Paternal Grandfather Education | | | | | | | | | |
| Grade 9 or less | 80 (48%) | 5.94 (2.62)*** | 190 (31%) | 4.12 (1.06)*** | 28 (21%) | 1.57 (.60) | 84 (22%) | 1.69 (.43)* | 141 (20%) |
| Grade 10 | 42 (25%) | 6.26 (2.79)*** | 131 (22%) | 4.98 (1.30)*** | 33 (24%) | 3.29 (1.19)*** | 58 (16%) | 1.97 (.51)* | 75 (10%) |
| Grade 11 or 12 | 14 (9%) | 2.31 (1.11) | 49 (8%) | 2.07 (.57)** | 25 (19%) | 2.06 (.74)* | 64 (17%) | 2.05 (.50)** | 96 (13%) |
| Vocational qualification | 22 (13%) | 1.67 (.75) | 203 (34%) | 3.83 (.88)*** | 29 (22%) | 1.21 (.41) | 118 (32%) | 1.73 (.37)* | 212 (29%) |
| University qualification (<i>reference</i>) | 8 (5%) | | 32 (5%) | | 19 (14%) | | 50 (13%) | | 197 (27%) |
| Control Variables | | | | | | | | | |
| Father language other than English (Y) | 18 (11%) | .59 (.17) | 38 (6%) | .41 (.09)*** | 11 (8%) | .52 (.18) | 43 (12%) | .83 (.17) | 106 (15%) |
| Father is Indigenous (Y) | 1 (<1%) | 1.58 (2.26) | 7 (1%) | 3.83 (4.15) | 1 (<1%) | 3.94 (5.64) | 4 (1%) | 5.28 (5.97) | 1 (<1%) |
| Father’s age in years | <i>M</i> = 46.59 <i>SD</i> = 6.06 | .96 (.02)* | <i>M</i> = 46.40 <i>SD</i> = 5.71 | .96 (.01)*** | <i>M</i> = 45.93 <i>SD</i> = 5.42 | .95 (.02)** | <i>M</i> = 45.64 <i>SD</i> = 5.40 | .94 (.01)*** | <i>M</i> = 47.49 <i>SD</i> = 5.39 |
| Model Summary Statistics | | | | | | | | | |
| <i>N</i> | | 2,000 | | | | | | | |
| <i>LR chi</i> ² | | 452.91*** | | | | | | | |
| <i>df</i> | | 60 | | | | | | | |

* $p < .05$; ** $p < .01$; *** $p \leq .001$

Are there gender-specific relationships between parents' interest in their adolescent child's education and contemporaneous child outcomes?

Descriptive analyses were performed to explore the bivariate relationship between parents' level of education and the level of interest they were perceived as showing in their child's education (see Appendix: Table A3). Cross-tabulations showed a significant association between mothers' level of education and the level of interest shown in the education of daughters (χ^2 (8, N = 1,942) = 33.73, $p < .001$) and sons (χ^2 (8, N = 1,771) = 50.18, $p < .001$). Fathers' level of education was also found to be significantly associated with the level of interest shown in the education of daughters (χ^2 (8, N = 1,942) = 67.25, $p < .001$) and sons (χ^2 (8, N = 1,771) = 63.56, $p < .001$). As would be expected from previous research, and consistent with the finding reported above for grandparents, highly educated parents were more likely to be perceived as showing lots of interest in their child's education, and less likely to be perceived as showing little to no interest.

Descriptive statistics for the child outcome variables (in non-standardised form) are displayed in Table 3 (below) for waves 5 and 6 separately.

Table 3. Descriptive Statistics for Child Outcome Variables for Daughters and Sons

| | <u>Daughters</u> | | <u>Sons</u> | |
|---|------------------|-------|-------------|-------|
| | Mean | SD | Mean | SD |
| <hr/> | | | | |
| NAPLAN Reading | | | | |
| Wave 5 | 575.89 | 66.73 | 558.92 | 72.27 |
| Wave 6 | 620.66 | 64.22 | 598.75 | 70.17 |
| NAPLAN Numeracy | | | | |
| Wave 5 | 560.73 | 68.83 | 569.25 | 77.64 |
| Wave 6 | 613.52 | 73.06 | 620.38 | 75.39 |
| Academic Rating Scale (ARS) | | | | |
| Wave 5 | 4.32 | .70 | 3.95 | .86 |
| Wave 6 | 4.47 | .64 | 4.10 | .80 |
| Efficacy-Related Self-Concept | | | | |
| Wave 5 | 4.13 | .66 | 4.16 | .64 |
| Wave 6 | 4.02 | .73 | 4.06 | .65 |
| <hr/> | | | | |
| | <i>N</i> | % | <i>N</i> | % |
| <hr/> | | | | |
| Child Expects to attain a University Qualification Wave 5 | | | | |
| No | 381 | 34% | 461 | 45% |
| Yes | 731 | 66% | 556 | 55% |
| Child Expects to attain a University Qualification Wave 6 | | | | |
| No | 165 | 20% | 252 | 34% |
| Yes | 647 | 80% | 481 | 66% |
| <hr/> | | | | |

The probabilities of transitions in children's perceptions of mothers' and fathers' interest in their education from wave 5 to wave 6 were calculated for those children present in the models for both waves (see Appendix: Tables A4 and A5). In total, just over a quarter of children who

were present for both waves reported a change in the level of interest their mothers were showing from wave 5 to wave 6, and over a third of children reported a change in the level of interest their fathers were showing. These changes were fairly evenly distributed between increases and decreases in parent interest.

Panel regression models with random effects were used to assess the relationship between mothers' and fathers' interest and child outcomes, including NAPLAN reading and numeracy scores, ARS scores, and the child's self-concept across waves 5 and 6. The results of these analyses are displayed for girls and boys respectively in Tables 4 and 5 below.

As Table 4 shows, mothers' interest - net of fathers' interest and parents' level of education - had significant relationships with ARS scores and self-concept in daughters. When mothers showed some as opposed to lots of interest, ARS scores were on average .09 of a standard deviation lower. A larger effect was observed for children's self-concept: When mothers were perceived as showing some interest as opposed to lots the average reduction in self-concept score was .23 of a standard deviation. Fathers' interest was also significantly related to daughters' self-concept, with the perception that their fathers were showing little to no interest being associated with a self-concept score .46 of a standard deviation lower compared with the perception that their fathers were showing lots of interest. When fathers showed some interest compared to lots the average reduction in self-concept score was .31 of standard deviation.

The only significant relationship that mothers' interest had with any of the child outcomes for boys was with their self-concept (see Table 5). When boys perceived that their mother was showing little to no interest in their education this was associated with a self-concept score on average .71 of a standard deviation lower than when boys perceived their mother to be showing lots of interest. The level of interest shown by fathers had a similar relationship with the self-concept of boys: When fathers were perceived as showing little or no interest compared with lots the average reduction in self-concept score was .28 of a standard deviation, and when they were perceived as showing some interest compared with lots the average reduction in self-concept score was .15 of a standard deviation. Furthermore, a significant relationship was observed between father interest and sons' ARS scores. When fathers were perceived as showing little or no interest in the education of boys, this was associated with an ARS score on average .18 of a standard deviation lower compared to when fathers were perceived as showing lots of interest.

Table 4. Panel regression models with random effects showing the relationship between mothers' and fathers' interest in their daughter's education and child outcomes

| | <u>Daughters' Outcomes</u> | | | |
|--|---------------------------------|----------------------------------|--|--|
| | NAPLAN reading <i>b</i> (se) | NAPLAN numeracy <i>b</i> (se) | Teacher rating – literacy <i>b</i> (se) | Efficacy-related self-concept <i>b</i> (se) |
| Mother's Interest in Child's education | | | | |
| No/Not much | -.04 (.10) | .06 (.08) | .05 (.10) | -.19 (.13) |
| Some | .01 (.04) | -.01 (.04) | -.09 (.05)* | -.23 (.06)*** |
| Lots (<i>reference</i>) | | | | |
| Father's Interest in Child's education | | | | |
| No/Not much | -.12 (.07) | -.08 (.06) | -.12 (.07) | -.46 (.09)*** |
| Some | -.07 (.04) | -.03 (.03) | -.04 (.04) | -.31 (.05)*** |
| Lots (<i>reference</i>) | | | | |
| Mother's Education | | | | |
| Less than Grade 12 | -.42 (.08)*** | -.38 (.08)*** | -.11 (.07) | -.10 (.09) |
| Less than Grade 12 with a post-school qualification | -.34 (.06)*** | -.29 (.06)*** | -.15 (.05)** | -.14 (.07)* |
| Grade 12 | -.23 (.08)** | -.23 (.08)** | -.04 (.07) | -.01 (.09) |
| Grade 12 with a non-university post-school qualification | -.16 (.06)** | -.16 (.05)** | -.02 (.05) | -.04 (.07) |
| Grade 12 with university qualifications (<i>reference</i>) | | | | |
| Father's Education | | | | |
| Less than Grade 12 | -.53 (.09)*** | -.38 (.08)*** | -.34 (.07)*** | .00 (.09) |
| Less than Grade 12 with a post-school qualification | -.40 (.06)*** | -.36 (.06)*** | -.20 (.05)*** | -.00 (.07) |
| Grade 12 | -.30 (.09)*** | -.15 (.08) | -.18 (.08)* | .08 (.10) |
| Grade 12 with a non-university post-school qualification | -.24 (.06)*** | -.24 (.06)*** | -.08 (.06) | .01 (.07) |
| Grade 12 with university qualifications (<i>reference</i>) | | | | |
| Control Variables | | | | |
| Matrix reasoning | .11 (.01)*** | .15 (.01)*** | .08 (.01)*** | .04 (.01)*** |
| Child's Age | .00 (.00) | .00 (.00) | .02 (.01) | -.08 (.02)*** |
| Living in rented home (Y) | -.01 (.06) | .05 (.05) | -.11 (.05)* | -.22 (.07)** |
| Child speaks language other than English (Y) | -.01 (.07) | .32 (.06)*** | -.02 (.06) | -.11 (.08) |
| Child is Indigenous (Y) | -.27 (.18) | -.40 (.17)* | -.28 (.15) | .13 (.19) |
| Father lives elsewhere (Y) | -.07 (.08) | -.19 (.08)* | -.01 (.08) | .09 (.10) |
| Mother lives elsewhere (Y) | -.06 (.22) | .02 (.20) | .12 (.19) | .09 (.25) |
| Model Summary Statistics | | | | |
| <i>N</i> (Observations) | 1,942 | 1,942 | 1,942 | 1,942 |
| <i>N</i> (Individuals) | 1,281 | 1,281 | 1,281 | 1,281 |
| Wald $\chi^2(df)$ | 476.10*** (19) | 678.49*** (19) | 258.72*** (19) | 208.71*** (19) |
| R^2 | .25 | .34 | .14 | .12 |

Note. Dependent variables are all standardised. * $p < .05$; ** $p < .01$; *** $p \leq .001$

Table 5. Panel regression models with random effects showing the relationship between mothers' and fathers' interest in their son's education and child outcomes

| | <u>Sons' Outcomes</u> | | | |
|--|---------------------------------|----------------------------------|--|--|
| | NAPLAN reading <i>b</i> (se) | NAPLAN numeracy <i>b</i> (se) | Teacher rating – literacy <i>b</i> (se) | Efficacy-related self-concept <i>b</i> (se) |
| Mother's Interest in Child's education | | | | |
| No/Not much | -.22 (.13) | .07 (.12) | -.12 (.15) | -.71 (.15)*** |
| Some | .01 (.05) | .05 (.04) | -.04 (.06) | -.10 (.06) |
| Lots (<i>reference</i>) | | | | |
| Father's Interest in Child's education | | | | |
| No/Not much | -.10 (.08) | -.00 (.07) | -.18 (.09)* | -.28 (.09)** |
| Some | -.01 (.04) | .01 (.04) | -.01 (.05) | -.15 (.05)** |
| Lots (<i>reference</i>) | | | | |
| Mother's Education | | | | |
| Less than Grade 12 | -.34 (.09)*** | -.23 (.08)** | -.17 (.09) | -.12 (.09) |
| Less than Grade 12 with a post-school qualification | -.32 (.07)*** | -.23 (.07)** | -.28 (.07)*** | -.18 (.07)* |
| Grade 12 | -.25 (.09)** | -.16 (.08) | -.25 (.08)** | .03 (.06) |
| Grade 12 with a non-university post-school qualification | -.15 (.06)* | -.11 (.06) | -.05 (.06) | -.03 (.06) |
| Grade 12 with university qualifications (<i>reference</i>) | | | | |
| Father's Education | | | | |
| Less than Grade 12 | -.52 (.09)*** | -.49 (.09)*** | -.27 (.09)** | -.05 (.09) |
| Less than Grade 12 with a post-school qualification | -.41 (.07)*** | -.41 (.06)*** | -.23 (.07)*** | .04 (.07) |
| Grade 12 | -.16 (.10) | -.24 (.10)* | -.19 (.10) | -.04 (.10) |
| Grade 12 with a non-university post-school qualification | -.35 (.07)*** | -.27 (.07)*** | -.14 (.07)* | .03 (.07) |
| Grade 12 with university qualifications (<i>reference</i>) | | | | |
| Control Variables | | | | |
| Matrix reasoning | .13 (.01)*** | .17 (.01)*** | .08 (.01)*** | .01 (.01) |
| Child's Age | -.003 (.001)** | -.002 (.00)* | -.002 (.02) | -.06 (.02)*** |
| Living in rented home (Y) | -.05 (.07) | -.13 (.06)* | -.24 (.07)*** | -.04 (.07) |
| Child speaks language other than English (Y) | -.16 (.08)* | .06 (.08) | -.04 (.08) | -.01 (.08) |
| Child is Indigenous (Y) | -.30 (.17) | -.22 (.17) | -.36 (.17)* | -.17 (.17) |
| Father lives elsewhere (Y) | -.02 (.09) | -.09 (.09) | -.05 (.10) | -.19 (.10) |
| Mother lives elsewhere (Y) | -.40 (.22) | -.44 (.21)* | -.53 (.22)* | -.14 (.22) |
| Model Summary Statistics | | | | |
| <i>N</i> (Observations) | 1,771 | 1,771 | 1,771 | 1,771 |
| <i>N</i> (Individuals) | 1,217 | 1,217 | 1,217 | 1,217 |
| Wald <i>chi</i> ² (<i>df</i>) | 458.68*** (19) | 664.55*** (19) | 253.05*** (19) | 103.78*** (19) |
| <i>R</i> ² | .27 | .35 | .15 | .07 |

Note. Dependent variables are all standardised. * $p < .05$; ** $p < .01$; *** $p \leq .001$

The other child outcome of interest in this study was the child's expectations for their future level of educational attainment. As Table 3 showed, by wave 6 approximately 20% of daughters and 34% of sons did not expect to attain a university qualification. Tables 8 and 9 below show cross-tabulations of daughters' and sons' expectations for attaining a university qualification with perceptions of mothers' and fathers' interest.

Table 8. Cross-tabulation of mother and father interest and daughter's expectations for future educational attainment (waves 5 and 6 pooled)

| | <u>Daughter Expects to Attain a University Qualification</u> | | Total <i>N</i> (%) |
|-------------------|--|---------------------|-----------------------|
| | No <i>N</i> (%) | Yes <i>N</i> (%) | |
| Mother's Interest | | | |
| No/Not much | 22 (37%) | 37 (63%) | 59 (100%) |
| Some | 145 (33%) | 288 (67%) | 433 (100%) |
| Lots | 379 (26%) | 1,053 (74%) | 1,432 (100%) |
| Father's Interest | | | |
| No/Not much | 69 (44%) | 87 (56%) | 156 (100%) |
| Some | 190 (32%) | 397 (68%) | 587 (100%) |
| Lots | 287 (24%) | 894 (76%) | 1,924 (100%) |

Note. Data pooled across waves 5 and 6, *N* = number of observations

Table 9. Cross-tabulation of mother and father interest and son's expectations for future educational attainment (waves 5 and 6 pooled)

| | <u>Son Expects to Attain a University Qualification</u> | | Total <i>N</i> (%) |
|-------------------|---|---------------------|-----------------------|
| | No <i>N</i> (%) | Yes <i>N</i> (%) | |
| Mother's Interest | | | |
| No/Not much | 23 (59%) | 16 (41%) | 39 (100%) |
| Some | 179 (51%) | 174 (49%) | 353 (100%) |
| Lots | 511 (38%) | 847 (62%) | 1,358 (100%) |
| Father's Interest | | | |
| No/Not much | 72 (59%) | 51 (41%) | 123 (100%) |
| Some | 253 (45%) | 315 (55%) | 568 (100%) |
| Lots | 388 (37%) | 671 (63%) | 1,059 (100%) |

Note. Data pooled across waves 5 and 6, *N* = number of observations

To assess the relationships between parents' interest and child expectations, logistic panel regression models with random effects were used (see Table 10 below). The outcome was whether the child expects to attain a university qualification in the future. For these models, measures of the child's current level of academic achievement in the form of NAPLAN and ARS scores were used as controls, and the child's self-concept score was also included as an explanatory variable. Models were run separately for the same samples of girls and boys present in the child outcome analyses reported above.

Table 10. Logistic panel regression models with random effects: Odds ratios for expecting to attain a university qualification for daughters and sons respectively

| | <u>Daughters</u> OR (95% CIs) | <u>Sons</u> OR (95% CIs) |
|--|----------------------------------|-----------------------------|
| Efficacy-related Self-Concept | 1.25 (1.06, 1.48)** | 1.40 (1.14, 1.71)** |
| Mother's Interest in Child's education | | |
| No/Not much | .88 (0.35, 2.19) | 1.64 (0.51, 5.30) |
| Some | 1.11 (0.74, 1.68) | .75 (0.48, 1.18) |
| Lots (<i>reference</i>) | | |
| Father's Interest in Child's education | | |
| No/Not much | .44 (0.24, 0.82)* | .55 (0.27, 1.11) |
| Some | .71 (0.49, 1.03) | .96 (0.65, 1.42) |
| Lots (<i>reference</i>) | | |
| Mother's Education | | |
| Less than Grade 12 | .54 (0.30, 0.99)* | .30 (0.15, 0.57)*** |
| Less than Grade 12 with a post-school qualification | .42 (0.26, 0.66)*** | .42 (0.24, 0.73)** |
| Grade 12 | .48 (0.27, 0.86)* | .60 (0.32, 1.11) |
| Grade 12 with a non-university post-school qualification | .34 (0.21, 0.53)*** | .59 (0.36, 0.96)* |
| Grade 12 with university qualifications (<i>reference</i>) | | |
| Father's Education | | |
| Less than Grade 12 | .51 (0.27, 0.95)* | .32 (0.16, 0.63)*** |
| Less than Grade 12 with a post-school qualification | .59 (0.38, 0.93)* | .31 (0.19, 0.52)*** |
| Grade 12 | .76 (0.39, 1.48) | .48 (0.23, 1.00)* |
| Grade 12 with a non-university post-school qualification | .86 (0.53, 1.41) | .55 (0.32, 0.95)* |
| Grade 12 with university qualifications (<i>reference</i>) | | |
| Academic achievement | | |
| NAPLAN reading | 1.68 (1.33, 2.13)*** | 2.58 (1.95, 3.40)*** |
| NAPLAN numeracy | 1.92 (1.48, 2.49)*** | 2.03 (1.56, 2.64)*** |
| Teacher rating - literacy | 1.04 (0.84, 1.29) | 1.28 (1.05, 1.57)* |
| Control Variables | | |
| Child's Age | 1.71 (1.47, 2.00)*** | 1.53 (1.31, 1.80)*** |
| Living in rented home (Y) | .94 (0.59, 1.50) | 1.25 (0.73, 2.13) |
| Child speaks language other than English (Y) | 1.53 (0.84, 2.81) | 3.68 (1.84, 7.37)*** |
| Child is Indigenous (Y) | .82 (0.25, 2.71) | .57 (0.16, 2.07) |
| Father lives elsewhere (Y) | .79 (0.43, 1.47) | .56 (0.27, 1.19) |
| Mother lives elsewhere (Y) | 1.32 (0.23, 7.61) | .64 (0.11, 3.69) |
| Model Summary Statistics | | |
| N (Observations) | 1,924 | 1,750 |
| N (Individuals) | 1,274 | 1,208 |
| Wald $\chi^2(df)$ | 142.10*** (22) | 154.47*** (22) |

* p<.05; ** p<.01; *** p≤.001

Table 10 (above) shows that the level of interest a father is perceived by his daughter as showing in her education has a significant relationship with her expectations for future educational attainment, controlling for her current level of academic achievement. The odds of girls expecting to attain a university qualification were more than doubled when fathers were perceived to be showing lots of interest as opposed to little or no interest. While fathers' level of interest was a significant predictor of girls' expectations for educational attainment, mothers' level of interest was not. On the other hand, mothers' level of education showed stronger, more consistent associations with daughters' expectations than fathers' education. This suggests that the strongest impact mothers have on their daughters' expectations may be via role-modelling, whereas for fathers the active interest they take in their daughter's education is also important. As expected, self-concept was also a significant predictor of girls' educational expectations. A one standard deviation increase in self-concept score was associated with the odds of daughters expecting to attain a university qualification increasing by 1.25 times.

In the model for sons, neither mother nor father interest were found to be significantly related to sons' expectations for attaining a university qualification in the future. However, both mothers' and fathers' level of education were. Self-concept was also found to significantly predict sons' educational expectations. Holding sons' current levels of academic achievement constant, increases in self-concept scores of one standard deviation were associated with the odds of expecting to attain a university qualification increasing by 1.40 times. Furthermore, a one standard deviation increase in sons' ARS scores was associated with the odds of expecting to attain a university qualification increasing by 1.28 times. Bearing in mind that both mothers' and fathers' interest were associated with sons' self-concept, and fathers' interest was associated with sons' ARS scores, this suggests that the interest parents show in their son's education may have some indirect relationships with their son's expectations for future educational attainment via self-concept and teacher-rated academic ability.

5 Discussion

The results of this study add to the literature supporting a positive relationship between parents' engagement with their child's education and child outcomes both proximal and distal. Parents' retrospective accounts of the interest shown by grandparents (that is, the parents' parents) in their education, which could be considered to represent the aggregate level of interest shown across parents' childhoods, were positively related to the level of education attained by parents

in adulthood. Furthermore, adolescents' reports of their mothers' and fathers' current interest in their learning and education showed positive, significant associations with some contemporaneous child outcomes, particularly the child's efficacy-related self-concept and, in the case of daughters, their expectations for attaining a university qualification.

An important gap in the parent engagement literature, which this study has made a contribution towards addressing, is the identification of gender-specific effects. With regards to the relationships between grandparents' interest and the educational attainment of parents, a lack of interest from either grandparent was found to have more consistent, negative associations with the educational attainment of mothers compared with fathers. However, this may reflect the fact that the sample of fathers was smaller and potentially less representative than the sample of mothers, resulting in a reduction in statistical power. When it came to the proximal outcomes of the adolescent children in this study, relationships with parent interest were gendered in varying ways. On the one hand, some significant associations were found between teacher-rated literacy abilities and the interest shown by the child's own-gender parent. On the other hand, both mother and father interest were found to be positively related to the efficacy-related self-concept of sons and daughters, with the largest associations observed with the level of interest shown by the opposite-gender parent. Furthermore, when fathers were perceived to be showing little to no interest (compared to lots) in the education of their daughters, their daughters were significantly less likely to expect themselves to attain a university qualification in the future – an association not observed with mothers' interest and also not apparent in sons.

Overall, our findings would appear somewhat consistent with those of Flouri (2006), who found that fathers' interest in their child's education at age ten directly predicted the adult educational attainment of daughters but not sons. Our findings could also be considered consistent with those of Croft et al. (2014), who found that fathers' implicit gender role beliefs (which we might assume to be reflected in the level of interest shown in their daughter's education) predicted the occupational aspirations of daughters but not sons. Despite changing gender norms and vast increases in the numbers of women attaining a university education, the findings of this study may be indicative that a small proportion of fathers continue to hold traditional gender schemas that harm the life chances of their daughters. It would thus appear that the father-daughter dyad is particularly deserving of attention in future research. Identifying the characteristics of disengaged fathers, how and why their lack of interest is

harmful to their adolescent daughters, and effective methods for increasing their levels of engagement are all promising directions for further research.

However, it is important to emphasise that the findings of this study should not be interpreted as evidence that fathers' interest is unimportant for the educational outcomes of their adolescent sons. First, fathers' interest appears to have an indirect relationship with the educational expectations of sons via self-concept and teacher-rated academic abilities. Second, it is possible that the lack of a significant, direct association between fathers' interest and the educational expectations of their sons may be attributed to the gendered nature of occupational pathways. Females in countries such as Australia and the U.S. are now more likely to expect to attain a university qualification than their male peers (Wells, Seifert, Padgett, Park & Umbach, 2011; Reynolds & Burge, 2008) - a trend observed in this study – while a higher proportion of vocational training options continue to be in traditionally male-dominated occupations. If low levels of father interest do decrease the likelihood of sons expecting to attain a university qualification then this may be somewhat masked by a proportion of fathers showing lots of interest in the education of those sons expecting to pursue one of the more prestigious, male-dominated vocational pathways.

The fact that items measuring perceived parent interest were available both for children and, in retrospective form, their parents allowed us to investigate both proximal and distal educational outcomes. It must be noted, however, that as an indicator of parent engagement this measure has both strengths and limitations. The fact that it was self-reported by the child is a strength, given the importance of child perceptions in the transmission of academic values from parent to child (Gniewosz & Noack, 2011). Another strength of this measure is its potential to capture a range of parent behaviours, including both overt displays of engagement (such as help with homework) and those that are more subtle (such as parent-child discussions about school activities). This is important given that parents may decrease their overt engagement behaviours when their child is self-motivated and performing well but are arguably less likely to cease showing interest altogether. Future research should seek to identify which specific parent behaviours correlate most strongly with adolescents' perceptions of parents' interest and, in turn, whether the qualitative nature of these behaviours moderates relationships between perceived interest and child outcomes. Whether or not these behaviours differ systematically according to the adolescent's prior achievement as well as parent factors such as gender, level of education and self-efficacy is also of interest.

The measure of parent interest used in this study was not without its limitations and could be improved for future use. In particular, there was no option for children who perceived their parents as being *too* interested in their education – which is a shame given that negative forms of engagement (for example, perceived pressure) have been associated with poorer child outcomes (Rogers et al., 2009). It may be useful if future measures of parent engagement attempt to capture perceptions of adequacy; that is, whether parents' engagement is perceived by their children as being inadequate, enough, or too much. It must also be noted that the child's perceptions are not the only important measure of parent engagement, just a commonly neglected one. Parents who are engaged in their child's education may benefit their children even when their behaviours are not perceived by the child. For example, when parents form a positive relationship with their child's teacher this may lead the teacher to view the child more favourably, or increase the likelihood that the child will be selected for extension activities (Walsh, 2008), all potentially without the child's knowledge. Hence the use of multiple measures including, but not limited to, the child's perceptions is ideal.

The findings of this study highlight the fact that careful consideration should be paid not only to the measures of parent engagement used, but also to the child outcomes measured. Just as certain types of parent engagement may be more beneficial for adolescents compared to younger children, so might parent engagement be more likely to benefit adolescents in certain, specific ways. Whilst some significant relationships were observed between perceptions of parent interest and the child's teacher-rated academic abilities, these associations were not large. This may be due, at least in part, to the measure of parent engagement used. As discussed above 'parent interest' may not capture the full range of engagement behaviours that parents use to benefit their children. It may also be evidence that the relationship between parents' engagement and children's cognitive outcomes is strongest during earlier phases of child development. The importance of parents' engagement in their child's learning at earlier stages of the life course for children's cognitive and academic outcomes is certainly well-supported (see Van Voorhis, Maier, Epstein & Lloyd, 2013 for a review).

However, this is not to suggest that the effects of parents' engagement in the education of their adolescent children are trivial or unimportant. The current study found that parent engagement during adolescence, as measured by perceptions of parents' interest, had a significant association with the efficacy-related self-concept of sons and daughters. This, in turn, was a significant predictor of children's expectations for future educational attainment.

Fathers' interest was also a significant predictor of daughters' expectations for attaining a university qualification net of the effects of self-concept. Previous research has identified that the attainment of educational qualifications in adulthood depends not only on academic achievement in school, but also on such psychological attributes as self-evaluations and expectations (Guay, Larose, & Boivin, 2004; Mello, 2008; Vargas Lascano et al., 2015). As such, these psychological attributes can be seen as central to the process of converting human capital, in the form of cognitive and academic abilities, into beneficial cultural capital in the form of educational attainment. There is evidence that young people from disadvantaged backgrounds are less likely to successfully complete this conversion (Johnson & Reynolds, 2013; Reynolds & Johnson, 2011; Yu & Daraganova, 2015). The role of these psychological attributes in the reproduction of educational inequalities should therefore not be minimised.

A limitation of this study that must be acknowledged was the exclusion of a significant number of children from the models predicting adolescent outcomes as the result of missing data. These children appeared to be more disadvantaged compared with the participating subsample, with significantly lower scores on academic outcomes and self-concept, and an increased likelihood of perceiving their parents as showing little or no interest in their education. This would suggest that the relationships observed here between parent interest and adolescent outcomes may not represent all Australian adolescent children. In particular, given the small number of mothers in this study perceived as showing little or no interest, significant effects may be difficult to identify without utilising a larger, more representative sample.

The use of panel regression methods is novel within the parent engagement literature. These methods facilitated a more dynamic view of the associations between parent interest and child outcomes during adolescence and as such represent a useful analytic tool that should be considered for use more often. In the two-year period covered in this study over a third of children reported a change in the level of interest shown by their fathers, and more than a quarter reported a change in the level of interest shown by their mothers. Hence, this more dynamic approach would appear well-founded. However, the nature of these methods means that we can only speak of associations between the variables of interest and cannot make claims regarding causality. As further waves of LSAC data become available it will be possible to analyse trajectories of parent interest across adolescence, which may provide further insights into the role that parent interest plays in educational decision-making and outcomes as adolescents emerge into adulthood.

6 Conclusions

This paper sought to address some of the existing gaps in the parent engagement literature, in particular the gender-specific associations between parent interest and children's educational outcomes both proximal and distal. The findings presented here suggest that when fathers take little or no interest in the education of their adolescent daughters this is associated with increased risks of negative outcomes in daughters, including lower levels of efficacy-related self-concept and a reduced likelihood of expecting to attain a university qualification in the future. Overall the results of this study suggest that the interest that both mothers and fathers take in their child's education during adolescence may be particularly important for the child's self-evaluations and, via these, their expectations. These, in turn, have been previously identified as important predictors of the child's educational attainment in adulthood. The fact that parents' interest significantly predicted child outcomes net of the effects of parents' education suggests that parent engagement is indeed one promising avenue for efforts to close the gap in educational outcomes. As knowledge of this mechanism becomes more nuanced and complete, the chances of effectively utilising it in interventions aimed at reducing educational inequalities is surely increased.

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Appendix: Supplementary Tables

Table A1. Comparisons between the participating and non-participating subsamples of children on variables of interest

| | Participating Children | Non-Participating Children | Statistical Tests of Significance |
|--|------------------------|----------------------------|---------------------------------------|
| Wave 5 Father Interest: frequencies (%) | | | |
| No/Not much | 194 (8%) | 214 (17%) | $\chi^2 (2, N = 3,758) = 68.17^{***}$ |
| Some | 755 (31%) | 373 (29%) | |
| Lots | 1,522 (61%) | 700 (54%) | |
| Wave 6 Father Interest: frequencies (%) | | | |
| No/Not much | 208 (9%) | 206 (20%) | $\chi^2 (2, N = 3,258) = 76.80^{***}$ |
| Some | 726 (32%) | 313 (31%) | |
| Lots | 1,304 (58%) | 501 (49%) | |
| Wave 5 Mother Interest: frequencies (%) | | | |
| No/Not much | 68 (3%) | 67 (5%) | $\chi^2 (2, N = 3,823) = 19.27^{***}$ |
| Some | 520 (21%) | 327 (24%) | |
| Lots | 1,883 (76%) | 958 (71%) | |
| Wave 6 Mother Interest: frequencies (%) | | | |
| No/Not much | 75 (3%) | 67 (6%) | $\chi^2 (2, N = 3,325) = 17.30^{***}$ |
| Some | 509 (23%) | 269 (25%) | |
| Lots | 1,655 (74%) | 750 (69%) | |
| NAPLAN Reading: mean (sd) | | | |
| Wave 5 | 567.41 (69.60) | 542.48 (69.28) | $t (3,469) = 9.71^{***}$ |
| Wave 6 | 607.53 (67.82) | 586.38 (66.28) | $t (2,596) = 6.66^{***}$ |
| NAPLAN Numeracy: mean (sd) | | | |
| Wave 5 | 565.03 (73.40) | 540.28 (73.07) | $t (3,456) = 9.12^{***}$ |
| Wave 6 | 614.40 (73.49) | 588.22 (70.91) | $t (2,583) = 7.60^{***}$ |
| Academic Rating Scale: mean (sd) | | | |
| Wave 5 | 4.14 (.81) | 3.79 (1.00) | $t (3,199) = 10.36^{***}$ |
| Wave 6 | 4.28 (.75) | 3.86 (.98) | $t (2,682) = 11.98^{***}$ |
| Self-Concept: mean (sd) | | | |
| Wave 5 | 4.14 (.65) | 3.97 (.74) | $t (3,839) = 7.14^{***}$ |
| Wave 6 | 4.03 (.71) | 3.86 (.76) | $t (3,345) = 6.18^{***}$ |
| Wave 5 Expects to Attain University Qual.: frequencies (%) | | | |
| No | 974 (40%) | 715 (52%) | $\chi^2 (1, N = 3,829) = 53.71^{***}$ |
| Yes | 1,479 (60%) | 661 (48%) | |
| Wave 6 Expects to Attain University Qual.: frequencies (%) | | | |
| No | 647 (29%) | 453 (42%) | $\chi^2 (1, N = 3,298) = 52.10^{***}$ |
| Yes | 1,568 (71%) | 630 (58%) | |

* $p < .05$; ** $p < .01$; *** $p \leq .001$

Table A2. Cross-tabulations of Grandparent education and interest in parents' education

| | <u>Interest shown in mother's education</u> | | Lots <i>N</i> (%) | Total <i>N</i> (%) |
|---|---|----------------------|----------------------|-----------------------|
| | No/not much <i>N</i> (%) | Some <i>N</i> (%) | | |
| Grandmother's level of education | | | | |
| Grade 9 or less | 260 (29%) | 267 (30%) | 371 (41%) | 898 (100%) |
| Grade 10 | 159 (18%) | 275 (31%) | 456 (51%) | 890 (100%) |
| Grade 11/12 | 66 (12%) | 149 (26%) | 345 (62%) | 560 (100%) |
| Vocational qualification | 64 (11%) | 176 (30%) | 341 (59%) | 581 (100%) |
| University qualification | 14 (5%) | 40 (15%) | 215 (80%) | 269 (100%) |
| Model chi ² (<i>df</i>) | 205.41***(8) | | | |
| <i>N</i> | 3,198 | | | |
| Grandfather's level of education | | | | |
| Grade 9 or less | 328 (38%) | 309 (36%) | 230 (26%) | 867 (100%) |
| Grade 10 | 174 (32%) | 201 (37%) | 171 (31%) | 546 (100%) |
| Grade 11/12 | 78 (20%) | 142 (36%) | 174 (44%) | 394 (100%) |
| Vocational qualification | 246 (26%) | 325 (35%) | 361 (39%) | 932 (100%) |
| University qualification | 57 (12%) | 95 (21%) | 307 (67%) | 459 (100%) |
| Model chi ² (<i>df</i>) | 248.18***(8) | | | |
| <i>N</i> | 3,198 | | | |
| | <u>Interest shown in father's education</u> | | Lots <i>N</i> (%) | Total <i>N</i> (%) |
| | No/not much <i>N</i> (%) | Some <i>N</i> (%) | | |
| Grandmother's level of education | | | | |
| Grade 9 or less | 153 (28%) | 199 (37%) | 186 (35%) | 538 (100%) |
| Grade 10 | 103 (18%) | 220 (38%) | 257 (44%) | 580 (100%) |
| Grade 11/12 | 45 (12%) | 141 (38%) | 189 (50%) | 375 (100%) |
| Vocational qualification | 33 (10%) | 110 (32%) | 199 (58%) | 342 (100%) |
| University qualification | 4 (3%) | 35 (21%) | 126 (76%) | 165 (100%) |
| Model chi ² (<i>df</i>) | 148.97***(8) | | | |
| <i>N</i> | 2,000 | | | |
| Grandfather's level of education | | | | |
| Grade 9 or less | 229 (44%) | 195 (37%) | 99 (19%) | 523 (100%) |
| Grade 10 | 135 (40%) | 135 (40%) | 69 (20%) | 339 (100%) |
| Grade 11/12 | 63 (25%) | 107 (43%) | 78 (32%) | 248 (100%) |
| Vocational qualification | 163 (28%) | 251 (43%) | 170 (29%) | 584 (100%) |
| University qualification | 51 (17%) | 91 (30%) | 164 (53%) | 306 (100%) |
| Model chi ² (<i>df</i>) | 160.03***(8) | | | |
| <i>N</i> | 2,000 | | | |

* p<.05; ** p<.01; *** p≤.001

Table A3. Cross-tabulations of parent education and current interest in sons' and daughters' education (waves 5 and 6 pooled)

| | <u>Interest shown in daughter's education</u> | | | Total N (%) |
|--|---|---------------|---------------|----------------|
| | No/not much N (%) | Some N (%) | Lots N (%) | |
| <u>Mother's level of education</u> | | | | |
| Less than Grade 12 | 12 (7%) | 57 (31%) | 115 (62%) | 184 (100%) |
| Less than Grade 12 with a post-school qualification | 16 (4%) | 111 (27%) | 291 (70%) | 418 (100%) |
| Grade 12 | 2 (1%) | 41 (24%) | 130 (75%) | 173 (100%) |
| Grade 12 with a non-university post-school qualification | 11 (3%) | 72 (17%) | 339 (80%) | 422 (100%) |
| Grade 12 with university qualifications | 19 (3%) | 155 (21%) | 571 (77%) | 745 (100%) |
| Model chi ² (df) | 33.73*** (8) | | | |
| N (observations) | 1,942 | | | |
| <u>Father's level of education</u> | | | | |
| Less than Grade 12 | 32 (17%) | 67 (37%) | 84 (46%) | 183 (100%) |
| Less than Grade 12 with a post-school qualification | 61 (10%) | 219 (35%) | 351 (55%) | 631 (100%) |
| Grade 12 | 12 (9%) | 45 (33%) | 79 (58%) | 136 (100%) |
| Grade 12 with a non-university post-school qualification | 26 (7%) | 98 (28%) | 228 (65%) | 352 (100%) |
| Grade 12 with university qualifications | 27 (4%) | 161 (25%) | 452 (71%) | 640 (100%) |
| Model chi ² (df) | 67.25*** (8) | | | |
| N (observations) | 1,942 | | | |
| | <u>Interest shown in son's education</u> | | | Total N (%) |
| | No/not much N (%) | Some N (%) | Lots N (%) | |
| <u>Mother's level of education</u> | | | | |
| Less than Grade 12 | 6 (3%) | 59 (31%) | 124 (66%) | 189 (100%) |
| Less than Grade 12 with a post-school qualification | 14 (4%) | 82 (24%) | 249 (72%) | 345 (100%) |
| Grade 12 | 3 (2%) | 50 (26%) | 140 (72%) | 193 (100%) |
| Grade 12 with a non-university post-school qualification | 5 (1%) | 86 (20%) | 350 (79%) | 441 (100%) |
| Grade 12 with university qualifications | 11 (2%) | 80 (13%) | 512 (85%) | 603 (100%) |
| Model chi ² (df) | 50.18*** (8) | | | |
| N (observations) | 1,771 | | | |
| <u>Father's level of education</u> | | | | |
| Less than Grade 12 | 25 (13%) | 75 (41%) | 85 (46%) | 185 (100%) |
| Less than Grade 12 with a post-school qualification | 46 (8%) | 222 (39%) | 304 (53%) | 572 (100%) |
| Grade 12 | 8 (6%) | 39 (32%) | 77 (62%) | 124 (100%) |
| Grade 12 with a non-university post-school qualification | 21 (6%) | 107 (32%) | 204 (62%) | 332 (100%) |
| Grade 12 with university qualifications | 24 (4%) | 135 (24%) | 399 (72%) | 558 (100%) |
| Model chi ² (df) | 63.56*** (8) | | | |
| N (observations) | 1,771 | | | |

* p<.05; ** p<.01; *** p≤.001

Table A4. Frequencies and probabilities of transitions in child's perceptions of mothers' interest in their education from wave 5 to wave 6

| | | <u>Girls: Wave 6</u> | | | |
|----------------------|--|----------------------|---------------|------------------|--------------|
| | | <i>N (row %)</i> | | | |
| | | Not much/no interest | Some interest | Lots of interest | <i>Total</i> |
| <u>Girls: Wave 5</u> | | | | | |
| Not much/no interest | | 8 (24%) | 18 (52%) | 8 (24%) | 34 (100%) |
| Some interest | | 20 (8%) | 111 (45%) | 118 (47%) | 249 (100%) |
| Lots of interest | | 17 (2%) | 153 (18%) | 697 (80%) | 867 (100%) |
| <i>Total</i> | | 45 (4%) | 282 (24%) | 823 (72%) | 1,150 (100%) |
| | | <u>Boys: Wave 6</u> | | | |
| | | <i>N (row %)</i> | | | |
| | | Not much/no interest | Some interest | Lots of interest | <i>Total</i> |
| <u>Boys: Wave 5</u> | | | | | |
| Not much/no interest | | 10 (42%) | 6 (25%) | 8 (33%) | 24 (100%) |
| Some interest | | 10 (5%) | 103 (46%) | 109 (49%) | 222 (100%) |
| Lots of interest | | 10 (1%) | 108 (13%) | 698 (86%) | 816 (100%) |
| <i>Total</i> | | 30 (3%) | 217 (20%) | 815 (77%) | 1,062 (100%) |

Table A5. Frequencies and probabilities of transitions in child's perceptions of fathers' interest in their education from wave 5 to wave 6

| | | <u>Girls: Wave 6</u> | | | |
|----------------------|--|----------------------|---------------|------------------|--------------|
| | | <i>N (row %)</i> | | | |
| | | Not much/no interest | Some interest | Lots of interest | <i>Total</i> |
| <u>Girls: Wave 5</u> | | | | | |
| Not much/no interest | | 48 (52%) | 36 (39%) | 8 (9%) | 92 (100%) |
| Some interest | | 50 (14%) | 165 (48%) | 132 (38%) | 347 (100%) |
| Lots of interest | | 32 (5%) | 159 (22%) | 517 (73%) | 708 (100%) |
| <i>Total</i> | | 130 (11%) | 360 (32%) | 657 (57%) | 1,147 (100%) |
| | | <u>Boys: Wave 6</u> | | | |
| | | <i>N (row %)</i> | | | |
| | | Not much/no interest | Some interest | Lots of interest | <i>Total</i> |
| <u>Boys: Wave 5</u> | | | | | |
| Not much/no interest | | 30 (36%) | 37 (44%) | 17 (20%) | 84(100%) |
| Some interest | | 28 (8%) | 167 (50%) | 138 (42%) | 333 (100%) |
| Lots of interest | | 20 (3%) | 156 (24%) | 471 (73%) | 647 (100%) |
| <i>Total</i> | | 78 (7%) | 360 (34%) | 626 (59%) | 1,064 (100%) |