Family and Career Plans of Students Graduating from New Zealand Universities

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Abstract

Childbearing plans are made in the context of life course, gender and education. This analysis considers the family plans of 5157 students without children graduating from university, who participated in the Graduate Longitudinal Study of New Zealand. Analysis explores differences by age, gender and major subject. Nearly 40 per cent of graduates planned to parent within the next 10 years, and most graduates placed the highest importance on combining career and children, rather than prioritising either career or children. These plans were consistent across all ages, with women having higher intentions for parenting than men. Difference by major were visible, with Commerce, Humanities and Creative Arts majors having the highest intentions for parenting within 10 years and STEM majors the lowest. Many graduates appear to be postponing plans for childbearing, which follows current patterns but could pose challenges.

Keywords: Fertility, parenting, work-family balance, gender, education

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U niversity has become an increasingly common step in young adulthood, with about 40 per cent of all young adults in OECD countries expected to hold a university degree (Buber-Ennser et al., 2013). When planning their future, university students might consider how their career goals intersect with other goals such as childbearing. In many cases, this means delaying childbearing. University graduates are the group most likely to postpone parenthood and to have fewer children than they expected (Bean, 2005; Buber-Ennser et al., 2013; Koropeckyj-Cox et al., 2015; Lampic et al., 2006; Lucas et al., 2015; Penfold & Foxton 2015; Sørensen et al., 2016; Virtala et al., 2011). This is particularly the case when highly educated people partner with one another, as they are more likely to do (Jackson, 2002). Postponing parenthood also contributes to the rising prevalence of infertility and unintended childlessness, situations that pose both emotional and financial difficulties (Tonkin, 2018). To support graduates in achieving their intentions around childbearing and work-family balance in the years after they leave university, it is necessary to understand their plans and goals.

Childbearing plans are made within the context of policies and social norms. McDonald (2000a) specifies that for people to realise their childbearing aspirations, both public and private institutions need to fully support gender equity in childbearing and child rearing. Childbearing will be problematic, resulting in low levels of overall fertility and individuals not reaching their aspired fertility, when there is a high level of gender equity in public institutions but a low level in private institutions (i.e. when parents do not share care of children). To counter this, it is necessary for policies and social norms to support the combining of employment with parenting (Billari, 2018, Goldsheider et al., 2015; McDonald, 2000a). However, gender equity within families is not supported by a neoliberal model that places responsibility for children on individuals and families (McDonald, 2000b). Aotearoa New Zealand established neoliberal economic reforms in the 1980s and these were entrenched by the early decades of the 2000s (Kelsey 1997). The existing national involvement in

reconciling employment and childcare is represented by a few policies, such as parental leave, early childhood education for pre-schoolers aged 3–4, and the ability to request flexible working arrangements (New Zealand Ministry for Women, 2020). Thus, students graduating in the early 2000s are contemplating their employment and childbearing futures in a structure that offers them a limited amount of support.

To understand how students about to graduate from university are considering their plans for childbearing in the context of their anticipated employment, we ask: "What are the intentions for parenting and for combining employment and childbearing?" This question draws on the key frameworks offered by life course and gender to understand the family plans of young adults aged 18–35 who are about to graduate from New Zealand universities. Because this research focuses on students who are about to graduate, these findings are particularly salient for those about to embark on a career. We also include ethnic groups not often visible in this body of research, including Māori and Pacific Peoples. Our findings can assist career counsellors, university lecturers and tutors and reproductive health professionals, as well as young adults themselves, to prepare for their lives ahead. Our study can also inform policymakers, employers and those shaping the public response to work-life balance.

Life course

Early adulthood (between the mid-twenties and later thirties) represents a period of multiple transitions and competing demands (Bittman & Wajcman, 2000). This 'rush hour of life' can involve education, entrance into the labour market, establishment of career and residence, forming intimate partnerships and childbearing all within a relatively short period of time. As such, early adulthood is a time when ideals and preferences for family and children will be particularly shaped by plans and goals for other aspects of life. Life course theory highlights that it is during the time of training for desired occupations that individuals begin to receive messages about how they will be expected to work, the ways in which success is defined

within their occupations, and the criteria for advancement (Elder, 1998; Pagnan & MacDermid Wadsworth, 2015).

Similarly, the cognitive-social model of childbearing suggests that plans for employment can increase awareness of family aspirations, so students about to graduate may be especially aware of their future plans for work and family (Bachrach & Morgan, 2013). This model accounts for ways in which individual cognitive preferences are both constructed and constrained by the social and structural context.

Committing oneself to a challenging career – or simply making decisions about course-related choices – may evoke the formation of intentions for children (Bachrach & Morgan, 2013). According to this model, we hypothesise that:

- **Hypothesis 1:** Younger students (in their early 20s) will have lower intentions for becoming a parent in the next 10 years and will prioritise a career over children to a greater extent than will older students (in their later 20s and early 30s).

Gendered expectations for parenting

Highly educated women take their childbearing plans into account when considering their future careers (Ussher, 2015). For example, both men and women enrolled in female-predominant programmes (such as veterinary medicine) in American universities perceived a need to prioritise career over family to be successful (Pagnan & MacDermid Wadsworth, 2015). As well as the financial costs of attending university, students consider the opportunity costs associated with balancing family and career plans. Opportunity costs are incurred when students drop out of university or take time out of the labour force to raise children (Bean, 2005; Joshi, 2002).

Persistent gendered inequalities in contemporary parenting affect employment expectations placed on mothers and fathers. A stable career increases the likelihood of remaining childless among women but increases the likelihood of entering fatherhood for men (Keizer et al., 2008), thus indicating divergent pathways into

childlessness among men and women. For those who become parents, while research shows that men have increased their overall time spent caring for children, women still report being primarily responsible for caregiving and housework (Pagnan & MacDermid Wadsworth, 2015). McDonald's (2000a) gender equity perspective would suggest that in a context where women have high level of opportunities, as for university graduates, yet are not supported in combining employment with parenting, they may consider delaying or foregoing childbearing. Thus, our second hypothesis states:

- **Hypothesis 2A:** Fewer women will report an intention to become a parent within the next 10 years compared with men.
- **Hypothesis 2B:** Women will prioritise children over career to a greater extent than will men.

Field of study and work-family balance

Different fields of undergraduate study lead to career trajectories that differ in their economic rewards, demands and the relative importance of balancing employment and family. For many women graduating from medical school, residency training occurs during childbearing years. Women entering medial school recognise this by planning to postpone pregnancy because of perceived threats to their careers (Tolhurst & Stewart, 2004; Willett et al., 2010). Graduate-level medical students in Australia considered how specialties would be compatible with family life, mindful that some specialties and locations offered work with flexible and limited hours while others, like surgery, would not (Tolhurst & Stewart 2004). Fields of study leading to jobs that are more accommodating of a work-family balance impose fewer constraints on childbearing. For example, research in the US shows that women who studied education and health were the earliest to have a first birth, whereas women who studied science and technology delayed childbearing (Michelmore & Musick, 2014). A small exploratory study at a New Zealand university of the career and family plans of Health Sciences students in a diverse New Zealand-born Pacific and Pacific-Islands-born group indicates that nearly all the participating students wished to combine career and having children.

Both men and women viewed both family and their medical profession as central to their identity (Maifea, 2016).

Students also face economic constraints as they develop their intentions for achieving work-family balance. High levels of student debt may constrain students' options by making employment necessary. The average debt of New Zealand university students graduating in 2014 was $20,000 (Nissen, 2015). This has been rising since the 1990s with increasing tuition costs, the abolition of universal student allowances and the introduction of the student loan scheme (Bean, 2005). Drawing on interviews with 70 students enrolled at New Zealand's eight universities – including Asian, Pacific, Māori and New Zealand European students – Nissen (2015) found that paid work is essential to accommodate students' loans. Yet, the pressure for graduates to maximise income in order to eliminate debt is a significant factor that problematises work-family balance. Among students with higher levels of debt, the most relaxed about their loans were students confident in their ability to 'deal' with their debt as a result of perceived high incomes once they graduated. Almost all the students claiming this relaxed attitude were male and the majority studied economics, commerce, management or engineering (Nissen, 2015). This educational context frames the third hypothesis:

- **Hypothesis 3:** Education and Humanities majors will have greater intentions to parent and to prioritise balancing career and children than STEM (Science, Technology, Engineering, Math), Health Sciences and Commerce majors.

Method

Data

This analysis uses data from the baseline wave of the Graduate Longitudinal Study New Zealand (GLSNZ; Tustin et al., 2012). Participants were those enrolled in a programme of study that would have allowed them to graduate with a bachelor's degree or higher after the successful completion of their studies in 2011. The baseline sampling was conducted across all eight New Zealand universities

between July and December 2011. A representative subsample stratified by university ($N = 13,343$) of all potential 2011 graduates (approximately 36 per cent of the expected total graduate population) was randomly selected and invited to participate in an online survey. A total of 8719 completed the full baseline survey, a response rate of 65 per cent (Tustin et al., 2012).

Survey questions were asked across a wide range of domains including general background characteristics; university experiences; aspirations, goals and values; earnings and assets; health and well-being; personality and community involvement (Tustin et al., 2012).

The sample for our analysis included all GLSNZ participants aged 20–34 who did not report having children, a total of 5157 (henceforth referred to as 'the sample').

Measures

Parenting intentions were ascertained using the participants' responses to a general question about their plans for 10 years' time. Specifically, the question was: "Where would you like to be in 10 years' time?" Participants were able to select as many responses as applied from a list of several options. Among them was an option for "parenting/caregiving". Those participants who endorsed the parenting option were considered to have intentions to become a parent within 10 years' time.

Children and career intentions were based on a series of three separate questions, asking the importance of "Having a career rather than children", "Having children rather than a career" and "Having both a career and children", with response options for each question ranging from 1 = 'not at all important' to 5 = 'extremely important'.

The key demographic characteristics we analyse are binary gender, age divided into the groups 20–24, 25–29 and 30–34 years, and domain of study, which includes STEM (Science, Technology, Engineering, Maths), Health Sciences, Education, Commerce, Humanities (including Social Sciences), Creative Arts and Other (including Architecture and Agriculture).

Other characteristics of the participants included their reported ethnicity (grouped as New Zealand European, Māori, Pacific Peoples, Asian and Multiple/Other), their student debt (in $NZ), and (coded dichotomously): whether they were in a relationship, whether they were a first-generation student, whether they were employed during their studies, if they reported a disability/impairment, and if their degree level was undergraduate (compared with postgraduate).

Analysis

Hypotheses were tested using bivariate and multivariate analyses. Parenting intentions were tested using chi-square and logistic regression, and children/career intentions were tested using ANOVA and OLS regression. Predicted probabilities were calculated using the method of Glynn (2012).

Results

Characteristics of the sample

Nearly two-thirds of the participants in the sample were women, reflecting both the greater number of women graduates in New Zealand and a slightly higher response rate for women (see Tustin et al., 2012). Most participants in the sample were in their early 20s, with only 7 per cent in their early 30s, as detailed in the first column of Table 1. STEM majors, Commerce majors, and Humanities majors each comprised about one-fifth of the sample, with about 10 per cent in each of the other major areas of study. Just over half of the sample identified as New Zealand European, 17 per cent as Asian, 7 per cent as Māori, and 2 per cent as Pacific Peoples, with an additional 19 per cent classified as Other ethnicities or as endorsing more than one ethnic group. Half of the sample reported being in a relationship, one-third was the first generation in their family to attend university, and 13 per cent reported a disability or long-term illness. A total of 67 per cent were undergraduates and 73 per cent were studying full time.

Nearly 60 per cent were employed, and they carried an average student debt of $21,283.21 (SD $18,853.91).

Across the total sample of non-parents, the first row of Table 1 shows that 37 per cent of the graduates intended to parent within 10 years. Cohort members with negative responses could include those who never want to be a parent, as well as those who would like to be a parent but who envisioned this happening more than 10 years in their future. The question was asked in a series of options for the next 10 years, and in this context the wording could have also been interpreted to mean being a stay-at-home parent. Thus, the response to this question represents an undercount of respondents' future intentions for childbearing.

Overall, non-parents placed highest importance on having both children and career. Having children rather than career was rated lower and having a career rather than children had the lowest average importance. Each of these future plans showed bivariate differences by gender, age and major, as indicated by the chi-square and ANOVA tests.

Intention to parent

Intention to parent within the next 10 years was examined in the context of focal variables and other characteristics using logistic regression (see Table 2). The first step included the focal characteristics of gender, age and major. As shown in Table 2, the strongest effect was for gender: women had odds over 2.5 times greater than men of expressing an intention to be parenting within 10 years. Regarding age, 25- to 29-year-olds were significantly less likely than 20- to 24-year-olds to intend to be parenting within 10 years. Those in the 30- to 34-year-old age bracket were just as likely as 20- to 24-year-olds to express an intention to be a parent within 10 years. As regards subject major, Health Sciences, Education and Humanities students had higher odds than STEM majors of expressing an intention to be parenting within 10 years. Students who majored in Commerce, Creative Arts or Other studies were no more or less likely than STEM students to express an intention to be parenting within 10 years.

Table 1: Characteristics of the sample and intentions for children and career

Total sample			
All (%)	***		
% intending to parent within 10 years	37.3	***	
Importance of both children and career, mean (SD)[1]	3.94 (1.02)	***	
Importance of career rather than children, mean (SD)[1]	2.41 (.98)	***	
Importance of children rather than career, mean (SD)[1]	2.84 (.97)	***	
Gender[2]	**Women**	**Men**	
All (%)	62.9	37.1	
% intending to parent within 10 years	46.3	22.3	
Importance of both children and career, mean (SD)[1]	3.99 (1.00)	3.87 (1.04)	
Importance of career rather than children, mean (SD)[1]	2.34 (.95)	2.52 (1.01)	
Importance of children rather than career, mean (SD)[1]	2.89 (.98)	2.78 (.96)	
Age[2]	**20–24**	**25–29**	**30–34**
All (%)	73.2	20.2	7.5
% intending to parent within 10 years	38.5	33.3	37.2
Importance of both children and career, mean (SD)[1]	3.98 (.98)	3.89 (1.03)	3.81 (1.14)
Importance of career rather than children, mean (SD)[1]	2.38 (.96)	2.49 (1.02)	2.48 (1.02)
Importance of children rather than career, mean (SD)[1]	2.86 (.97)	2.83 (.97)	2.79 (.98)
Major[2]	**STEM**	**Health**	**Education**
All (%)	19.6	11.8	9.6

% intending to parent within 10 years	29.4	52.5	51.9	
Importance of both children and career, mean (SD)[1]	3.80 (1.07)	4.22 (.84)	4.10 (.94)	
Importance of career rather than children, mean (SD)[1]	2.48 (1.00)	2.18 (.88)	2.01 (.86)	
Importance of children rather than career, mean (SD)[1]	2.77 (.99)	3.01 (.91)	3.05 (1.04)	

	Commerce	Humanities	Creative Arts	Other[3]
All (%)	20.5	21.5	7.9	9.2
% intending to parent within 10 years	29.6	39.7	31.5	36.3
Importance of both children and career, mean (SD)[1]	4.06 (.97)	3.81 (1.08)	3.83 (1.03)	3.94 (1.00)
Importance of career rather than children, mean (SD)[1]	2.57 (.99)	2.41 (.99)	2.61 (.98)	2.42 (.97)
Importance of children rather than career, mean (SD)[1]	2.93 (.95)	2.70 (.97)	2.72 (.97)	2.86 (.92)

Notes: 1. On a scale of 1 to 5, with 1 = 'not very important', and 5 = 'very important'.
2. Asterisks indicate significance for chi-square tests of each variable and intention.
3. Includes Agriculture and Architecture.

** = $p < 0.01$, *** = $p < 0.001$
N = 5157 graduates of New Zealand universities with no children at the time of graduation.

In the second step of the logistic regression analyses, we added the additional variables displayed in Table 2 as controls. As shown in Table 2, students who were in a relationship had about 1.4 the odds of expressing intentions to be parents within 10 years than did students who were not in a relationship. Undergraduate students also had odds 1.4 greater of expressing intention to parent than postgraduate students. In addition, students identifying as Asian or Other/Multiple ethnic groups had significantly lower odds than New Zealand Europeans to express intentions to parent within 10 years. The addition of the control variables made no difference to the association

of gender with intentions to parent, but the effect of age was no longer significant. For subject major, the effect of Health Sciences and Education was somewhat attenuated although they retained a significant association. However, the effect of being a Humanities major was reduced to non-significance. A suppression effect for Creative Arts was revealed: Creative Arts students had lower odds than STEM students of expressing an intention to parent within 10 years after the control variables were added to the model.

Predicted probabilities offer an interpretation of the focal characteristics in relation to one another, given typical values for all other characteristics. Predicted probabilities of intending to be a parent within 10 years were calculated separately for men and women by age (Figure 1) and by major subject area (Figure 2), with all other variables set to mean or modal values (see Notes below Figures 1 and 2). There are few differences by age visible in Figure 1, with the only clear differences being between men and women. Women have higher expectations of intending to parent within 10 years than men.

Table 2: Logistic regressions predicting intention to parent within 10 years

	Step 1			Step 2		
	B	**SE**	**OR**	**B**	**SE**	**OR**
Women	0.98***	0.07	2.66	0.95***	0.07	2.59
Age						
20–24[1]						
25–29	−0.21**	0.08	0.81	−0.05	0.08	0.95
30–34	−0.08	0.12	0.92	0.07	0.12	1.07
Major						
STEM[1]						
Health	0.68***	0.11	1.97	0.55***	0.11	1.74
Education	0.66***	0.12	1.93	0.37***	0.12	1.45
Commerce	−0.09	0.10	0.91	−0.14	0.10	0.87
Humanities	0.24*	0.10	1.27	0.06	0.10	1.06
Creative Arts	−0.12	0.13	0.88	−0.29*	0.13	0.75
Other	0.18	0.12	1.20	0.08	0.12	1.09
In a relationship				0.33***	0.06	1.38

	Step 1			Step 2		
Ethnicity						
NZ European[1]						
Māori				−0.21	0.12	0.81
Pacific Peoples				−0.13	0.23	0.88
Asian				−0.60***	0.10	0.55
Multiple/Other				−0.24***	0.08	0.78
Disability				0.16	0.09	1.17
Undergraduate				0.34***	0.07	1.41
Full-time study				0.04	0.07	1.04
Debt (in dollars)				0.00	0.00	1.00
First-generation student				−0.05	0.06	0.95
Employed during studies				0.09	0.06	1.09
Constant	−1.32***	0.08	0.27	−1.57***	0.13	0.21

Note: 1 is the reference category.
* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$
N = 5157 graduates of New Zealand universities with no children at the time of graduation. Model −2LL = 6295.169, model chi-square = 520.098 (20 df) $p < 0.001$.

Figure 1: Predicted probabilities of intending to parent within 10 years, as a function of gender and age (years)
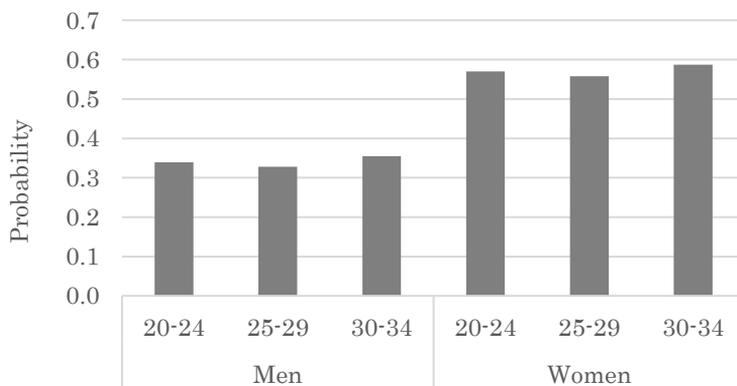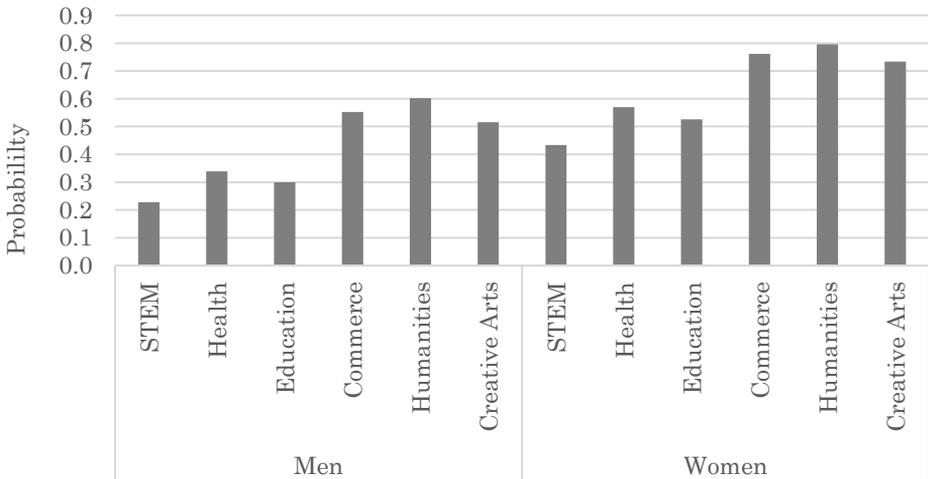

Note: Predicted probabilities are for participants with a Health Sciences major, undergraduate, New Zealand European, not in a relationship, no disability, not first generation, not employed, with average debt.
N = 5157 graduates of New Zealand universities with no children at the time of graduation.

Figure 2 shows a similar pattern for men and women, while revealing differences by subject area in predicted probabilities of intentions to parent. Probabilities of intending to parent are predicted for students who are aged 20–24, undergraduate, New Zealand European, not in a relationship, with no disability, not first generation, not employed, and with average debt. These probabilities reveal a pattern distinct from the overall regressions in Table 2, reflecting the differences in characteristics of students in each major.

For both men and women, the lowest probabilities of intending to parent within 10 years are found among majors in STEM, Health Sciences and Education subjects. The probability of STEM majors intending to parent is about 20 per cent for men and 40 per cent for women. In contrast, the highest probabilities of intending to parent are among Humanities, Commerce and Creative Arts majors. The probability of Humanities majors intending to parent is around 60 per cent for men and 80 per cent for women. Considering subject major and gender together, the probabilities of men in Humanities, Commerce and Creative Arts subjects intending to parent (50–60 per cent) are higher than the probability of women in STEM majors intending to parent (40 per cent).

Figure 2: Predicted probabilities of intending to parent within 10 years, as a function of gender and major subject area

Note: Predicted probabilities are for participants aged 20–24, undergraduate, New Zealand European, not in a relationship, no disability, not first generation, not employed, with average debt.
$N = 5157$ graduates of New Zealand universities with no children at the time of graduation.

Importance of children and career

As shown in Table 1, prioritising 'both children and career' received the strongest endorsement of the three career–children configurations. To explore the association of the three focal characteristics (gender, age, subject major) with these priorities while controlling for other characteristics, three separate ordinary least squares (OLS) regressions were used to predict the strength of importance given to each career–child configuration. As shown in Table 3, gender and subject major were important for all three configurations, but age only differentiated responses to 'both children and career.' Women rated the importance of 'both children and career' as well as the importance of 'children rather than career' more highly than did men. Conversely, men rated the importance of 'career rather than children' more highly than did women. Compared with the other major subject areas, those in STEM subjects had the lowest endorsement of 'both children and

career' and 'children rather than career.' 'Career rather than children'
appears more complex, with Creative Arts and Commerce majors
endorsing this configuration more strongly than did STEM majors,
while Health Sciences and Education majors gave lower endorsements
than did STEM majors.

    With regard to the other variables included in the model, Table
3 shows that the students who identified as Pacific Peoples or Asian
gave greater endorsements to all three career–children configurations
than did students who identified as New Zealand European. Those who
endorsed Multiple/Other ethnic groups were also more likely to place
greater emphasis on 'career rather than children' than those who
identified as New Zealand European. Those who were undergraduate
students at the time of the survey had stronger endorsement of
'children rather than career' and lower endorsement of 'career rather
than children' than did postgraduate students. The more student loan
debt carried by the students, the less strongly they endorsed having
'children rather than career.' Students who were employed during
their studies endorsed 'children rather than career' more strongly than
did those who were not employed. Finally, first-generation students
had stronger endorsements of 'career rather than children' than their
peers.

Table 3: Linear regressions predicting the importance of three configurations of career and children[1]

	Both children and career		Children rather than career		Career rather than children	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Women	0.06*	0.03	0.08**	0.03	−0.09**	0.03
Age						
20–24[2]						
25–29	−0.12 **	0.04	−0.03	0.04	0.04	0.04
30–34	−0.20 ***	0.06	−0.07	0.05	0.05	0.05
Major						
STEM[2]						
Health	0.37***	0.05	0.21***	0.05	−0.20***	0.05
Education	0.25***	0.06	0.21***	0.06	−0.31***	0.06
Commerce	0.23***	0.05	0.12**	0.04	0.09*	0.04
Humanities	−0.02	0.05	−0.09*	0.04	0.06	0.04
Creative Arts	−0.02	0.06	−0.08	0.06	0.26***	0.06
Other	0.11*	0.06	0.07	0.05	0.02	0.05
In a relationship	0.20***	0.03	0.06*	0.03	−0.12***	0.03
Ethnicity						
NZ European[2]						
Māori	−0.06	0.06	−0.07	0.06	0.10	0.05
Pacific Peoples	0.28*	0.11	0.27**	0.11	0.29**	0.10
Asian	0.11**	0.04	0.11***	0.04	0.44***	0.04
Multiple/Other	0.01	0.04	0.05	0.04	0.30***	0.04
Disability	0.01	0.04	−0.05	0.04	−0.01	0.04
Undergraduate	0.05	0.03	0.11**	0.03	−0.07*	0.03
Full time study	0.04	0.03	0.06	0.03	−0.04	0.03
Debt (in dollars)	< 0.01	< 0.01	< −0.01**	< 0.01	< −0.01	< 0.01
First-gen student	0.02	0.03	0.01	0.03	0.07*	0.03
Employed during studies	0.03	0.03	<0.01**	0.03	0.04	0.03
Constant	3.59***	0.06	2.63***	0.06	2.41	0.05

Notes: 1. On a scale of 1–5, with 1 = 'not very important', and 5 = 'very important'.
        2. Is the reference category.
* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$
N = 5157 graduates of New Zealand universities with no children at the time of graduation. Each configuration is tested in a separate model.

Hypothesis testing

Taken together, the four analyses we conducted allow us to examine the extent to which each hypothesis was supported. The first hypothesis stated that graduates in their early 20s would have lower intentions to parent and would prioritise career over children to a greater extent than would graduates in their late 20s to early 30s. The evidence here is mixed. The results of the bivariate analyses show that 25- to 29-year-olds were less likely than their younger and older peers to express an intention to parent within 10 years. Once control variables were added to the multivariate analyses, however, this effect disappeared. In addition, there was no apparent effect of age on the predicted probabilities of intending to parent. In contrast to our hypothesis, the bivariate analyses showed that the youngest group of students placed less emphasis on 'career rather than children' and more emphasis on 'both children and career' than did their older peers, but only the effect for 'both children and career' remained significant after controlling for all other variables in the linear regression analyses. Given these findings, this hypothesis was not supported.

Our second hypothesis stated that fewer women than men would report an intention to become a parent within 10 years. Contrary to our hypothesis, women graduates expressed much stronger wishes to become a parent within 10 years than did men, even after controlling for all other variables in the logistic regression analyses and predicted probabilities. This hypothesis further stated that women would prioritise children over career to a greater extent than would men. This hypothesis was supported by the bivariate analyses and the effects remained significant after controlling for all other variables in the linear regression analyses. Specifically, women expressed stronger preferences for combining children and career and for prioritising children over a career, whilst men expressed a stronger preference for prioritising their career.

The third hypothesis stated that Education and Humanities majors would have greater intentions to parent and to prioritise balancing career and children, compared with STEM, Health Sciences

and Commerce majors. With regard to intentions to parent, the bivariate analyses showed that Health Sciences and Education majors were most likely to express an intention to parent within 10 years, followed by Humanities majors. STEM and Commerce majors were the least likely to express this intention. After controlling for all other variables in the logistic regression analyses, Health Sciences and Education majors were still more likely than STEM majors to express intentions to parent. Note, however, that the predicted probabilities showed all three of these subject majors as less likely to express intentions to parent than were any other subject majors. With regard to the relative importance graduates placed on career versus children, bivariate analyses showed that Health Sciences, Education and Commerce graduates had the strongest endorsements for combining children and career and also the strongest endorsements of prioritising children over career. These effects remained consistent once all other variables had been controlled for in the multivariate analyses. The multivariate analyses showed that prioritising career over children was most strongly endorsed by Commerce and Creative Arts majors and least endorsed by Health Sciences and Education majors, with STEM and Humanities majors in between. Taken together, the results partially support our third hypothesis; the analyses indicated that the greatest contrast in family plans was between STEM majors and other majors.

Overall, these results show that university graduates have high expectations about becoming parents and combining parenthood with their careers. Those graduating with STEM majors had strong expectations for prioritising their career rather than becoming parents. Graduates in the Education and Commerce fields, in contrast, tended to have the highest expectations for becoming parents as well as prioritising combining children with their career.

Discussion

This study draws on graduates' responses as they consider their future careers alongside their intentions for becoming a parent. We examined age, gender and subject major to observe how these plans may differ.

Overall, we found that nearly 40 per cent of graduates planned to parent within 10 years. Graduates were forming complex plans for balancing work and family, placing the highest importance on combining a career and children. This was the preferred option for all respondents, regardless of age, gender or subject major, with stronger support than for prioritising either career or children. Across all ages, graduates express similar intentions, suggesting that graduates between 20 and 35 years of age are experiencing 'the rush hour of life' in a similar way.

Women had higher expectations than did men of parenting within 10 years; women had over twice the odds of expressing an intention of parenting within 10 years than men. Despite the overall finding that graduates placed greater emphasis on combining children with their careers than they did on prioritising either children or their career, there were clear variations in the relative emphasis respondents placed on each option by gender. Specifically, women were more likely than men to consider prioritising children over their career. This finding is consistent with the extensive research showing that far more women than men take parental leave or exit the workforce for a time after having children (Perry-Jenkins & Gerstel, 2020).

There were also clear patterns in parenting intentions and priorities by subject area: those undertaking Commerce, Humanities and Creative Arts majors expressed the highest level of intentions to parent within 10 years, and STEM majors the lowest. These results confirm prior findings that STEM disciplines are associated with delayed and lower levels of childbearing, especially for women (Michelmore & Musick, 2014). Although in our study the overall trends were similar for both men and women, the differences by subject major were so pronounced that men who were Commerce, Humanities and Creative Arts majors had a higher predicted probability of intending to parent than did women who were STEM majors. Extending prior research, our study also examined graduates' plans for combining work and family and found that Education and Health Sciences majors placed the highest importance on combining work and family. This supports findings that students in medical fields are actively

considering the possibilities of combining employment and child rearing as they choose their specialties (Tolhurst & Stewart 2004). This prior research also serves as a reminder that the broad groups of majors we measured in our study obscure a wide variation in majors and potential career paths within each grouping.

Given the focus on university graduates, our findings may not be applicable to those with other training and career pathways. Furthermore, these cross-sectional data are unable to disentangle the causality of choice of major and parenting expectations. For instance, it may be that STEM majors feel that they will be unable to combine children and career and thus need to choose between having a career and having children, and this is why they may be less likely to intend to have children. It may also be that those who choose STEM subjects as their major do so because they want to focus on their career and do not have a strong prior intention to have children. Furthermore, it is somewhat unclear how respondents interpreted the survey question asking them to consider what they might be doing in the next 10 years. It is possible that some interpreted the option of 'parenting children' as meaning that they would be a stay-at-home parent and thus may have answered in the negative despite planning to have children in that time frame. The wording of this option also emphasised their role as parents, rather than specific intentions for childbearing. This may have resulted in lower levels of expressed intentions than if the question had been asked more directly. As such, our results may be less applicable to the process of pregnancy and childbearing specifically and cannot be directly compared with research asking about childbearing desires and intentions.

In our study, about 60 per cent of the graduates in their early 20s did not plan to become a parent within 10 years. Many will nevertheless want to be a parent some day and this will push their time frame for having children into their mid-30s. Fully two-thirds of graduates in their late 20s did not plan on parenting within 10 years. This number will likely include many who do want to have a child some day and who may be planning to delay becoming a parent until their late 30s at the earliest. These findings reflect the increasing delay in

childbearing in New Zealand (Hohmann-Marriott, 2016). The graduates may be unrealistically optimistic, and like other New Zealand university students, they may overestimate the chances of a woman becoming pregnant, believe biological fertility decline to occur much later than it does in reality, and overestimate the effectiveness of assisted reproductive technologies (Lucas et al., 2015; Peterson et al., 2012; Tydén et al., 2006; Whitten et al., 2013). Their delays in childbearing could result in a higher chance of infertility, unintended childlessness and having fewer children than desired, along with health risks for mothers and children (Beaujouan & Sobotka, 2019; Tonkin, 2018). Future research needs to continue considering the role of education in fertility plans and achieved fertility, especially in light of partnering and employment.

This study helps to shed light on childbearing in New Zealand by focusing on university graduates as they are about to embark on their careers. Many graduates do want to parent and most would like to combine parenting with their career. This aligns with the standpoint that support for childbearing needs to ensure that young people have opportunities in both their public and private lives (Billari, 2018; Goldsheider et al., 2015; McDonald, 2000a, 2000b). Aotearoa New Zealand has recently begun using a well-being framework to make budgetary and policy decisions (New Zealand Treasury, 2018). Parents' work-family balance, while not directly addressed, is represented by the dimension of 'Jobs and earnings', which encompasses the quality of employment, along with aspects of 'Social connections' and 'Time use' (New Zealand Treasury, 2018). This well-being approach offers an unprecedented opportunity to support parents: the ability to combine employment with being an involved parent should be explicitly supported by budget and policy decisions. Policies can support employment and childbearing in three complementary ways (McDonald, 2000c): 1. financial support (i.e. cash payments to caregivers, tax exemptions, subsidised education, services and housing, loan deferrals during caregiving, living wage, universal basic income); 2. support for parents to combine employment and family (i.e. maternity and paternity leave, child care for young children and after

school, flexible working hours and short-term caregiving leave, anti-discrimination laws, working hours that are stable and not excessive); and 3. social support for children and parenting (i.e. ensuring available types of employment that can combine with caregiving, flexibility in re-entering employment, child-friendly built environments, gender equity within households and expectation of father involvement, positive social attitudes towards children and parenting, and support for parents of children with special needs and chronic illness). Feeling secure in institutional and cultural support for childbearing will mean that graduates can live lives that reflect their aspirations.

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References

Bachrach, C. A., and Morgan, S. P. (2013). A cognitive–social model of fertility intentions. *Population and Development Review 39*(3), 459–485. https://doi.org/10.1111/j.1728-4457.2013.00612.x.

Bean, C. (2005). Causes of delayed childbearing in New Zealand and Western societies. *New Zealand Population Review, 31*(2), 73–90. https://population.org.nz/app/uploads/2017/04/nzpr-vol-31-22005.pdf

Beaujouan, É., & Sobotka, T. (2019). Late childbearing continues to increase in developed countries. *Population & Societies, 562*(1), 1–4. https://www.cairn.info/revue-population-and-societies-2019-1-page-1.htm

Billari, F. C. (2018), A "great divergence" in fertility? In D. Poston, Jr. (Ed.), *Low fertility regimes and demographic and societal change* (pp. 15–35). Springer.

Bittman, M., & Wajcman, J. (2000). The rush hour: The character of leisure time and gender equity. *Social Forces, 79*(1), 165–189. https://doi.org/10.1093/sf/79.1.165

Buber-Ennser, I., Panova, R., & Dorbritz, J. (2013). Fertility intentions of university graduates. *Demográfia, 56*(5), 5–34.

Elder Jr, G. H. (1998). The life course as developmental theory. *Child Development, 69*(1), 1–12. https://doi.org/10.1111/j.1467-8624.1998.tb06128.x

Goldscheider, F., Bernhardt, E., & Lappegård, T. (2015). The gender revolution: A framework for understanding changing family and demographic behavior. *Population and Development Review, 41*, 207–239. https://doi.org/10.1111/j.1728-4457.2015.00045.x

Glynn, P. (2012). *Predicted probability from logistic regression output.* http://staff.washington.edu/glynn/predprob.pdf

Hohmann-Marriott, B. (2016). First-time mothers of advanced age in New Zealand. *New Zealand Population Review, 42*, 135–148. https://population.org.nz/app/uploads/2017/06/Vol-42-Full-document_Final.pdf

Jackson, N. O. (2002). The Higher Education Contribution Scheme: A HECS on 'The Family'? In G. Carmichael with D. Dharmalingham (Eds.), *The New Zealand and Australian Populations at the Millennium, Special Issue of the Journal of Population Research* (pp. 105–120.) Australian and New Zealand Population Associations.

Joshi, H. 2002. Production, reproduction, and education: Women, children and work in a British perspective. *Population and Development Review, 28*(5), 445–474. https://www.jstor.org/stable/3092836

Kelsey, J. (1997). *The New Zealand experiment: A world model for structural adjustment?* (2nd ed.). Auckland University Press.

Keizer, R., Dykstra, P., & Jansen, M. (2008). Pathways into childlessness: Evidence of gendered life course dynamics. *Journal of Biosocial Science, 40*(6), 863–878. https://doi.org/10.1017/S0021932007002660

Koropeckyj-Cox, T., Çopur, Z., Romano, V., & Cody-Rydzewski, S. (2015). University students' perceptions of parents and childless or childfree couples. *Journal of Family Issues,* 1–25. https://doi.org/10.1177/0192513X15618993

Lampic, C., Skoog Svanberg, A., Karlström, P., & Tydén, T. (2006). Fertility awareness, intentions concerning childbearing, and attitudes towards parenthood among female and male academics. *Human Reproduction, 21*(2), 558–564. https://doi.org/10.1093/humrep/dei367

Lucas, N., Rosario, R., & Shelling A. (2015). New Zealand university students' knowledge of fertility decline in women via natural pregnancy and assisted reproductive technologies. *Human Fertility, 18*(3), 208–214. https://doi.org/10.3109/14647273.2015.1006694

Maifea, N. (2016). *Rethink life's big decisions: What factors influence students' thought processes around career progression and work-life balance?* (Unpublished thesis for HRC Pacific Summer Studentship). University of Otago.

McDonald, P. (2000a). Gender equity in theories of fertility transition. *Population and Development Review, 26*, 427–439. https://doi.org/10.1111/j.1728-4457.2000.00427.x

——— (2000b). Gender equity, social institutions and the future of fertility. *Journal of Population Research*, *17*, 1–16. https://doi.org/10.1007/BF03029445

——— (2000c). *The 'toolbox' of public policies to impact on fertility – a global view.* Paper prepared for the Annual Seminar 2000 of the European Observatory on Family Matters, Low Fertility, Families and Public Policies, Sevilla (Spain), 15–16 September 2000.

Michelmore, K., & Musick, K. (2014). Fertility patterns of college graduates by field of study, US women born 1960–79. *Population Studies, 68*(3), 359–374. https://doi.org/10.1080/00324728.2013.847971

Nissen, S. (2015). Dividing a generation? New Zealand university students' perspectives on debt. *New Zealand Sociology, 30*(4), 176–189. https://search.informit.com.au/documentSummary;dn=800215713604727;res=IELIAC

New Zealand Ministry for Women. (2020). *Utilising women's skills.* https://women.govt.nz/work-skills/utilising-womens-skills

New Zealand Treasury. (2018). *Living standards framework: Background and future work.* https://treasury.govt.nz/publications/tp/living-standards-framework-background-and-future-work

Pagnan, C. E., & MacDermid Wadsworth, S. M. (2015). Graduate students' perceptions of the prospects for combining career and family: The role of academic program and gender. *The Journal of the Professoriate,* 8(1), 22-53. https://caarpweb.org/wp-content/uploads/2015/06/8-1_Pagnan_p22.pdf

Penfold, M., & Foxton, F. (2015). *Participation rates in the UK 2014: Women.* Office for National Statistics. https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/compendium/participationratesintheuklabourmarket/2015-03-19/participationratesintheuk20141overview

Perry-Jenkins, M., & Gerstel, N. (2020). Work and family in the second decade of the 21st century. *Journal of Marriage and Family, 82*, 420–453. https://doi.org/10.1111/jomf.12636

Peterson, B. D., Pirritano, M., Tucker, L., & Lampic, C. (2012). Fertility awareness and parenting attitudes among American male and female undergraduate university students. *Human Reproduction, 27*(5), 1375–1382. https://doi.org/10.1093/humrep/des011

Sørensen, N. O., Marcussen, S., Backhausen, M. G., Juhl, M., Schmidt, L.,
        Tydén, T., & Hegaard, H. K. (2016). Fertility awareness and
        attitudes towards parenthood among Danish university college
        students. *Reproductive Health, 13*(1), 1–10.
        https://doi.org/10.1186/s12978-016-0258-1

Tolhurst, H. M., & Stewart, S. M. (2004). Balancing work, family and other
        lifestyle aspects: A qualitative study of Australian medical students'
        attitudes. *Medical Journal of Australia, 181*, 361–364.
        https://doi.org/10.5694/j.1326-5377.2004.tb06326.x

Tonkin, L. (2018). *Motherhood missed: Stories from women who are childless
        by circumstance*. Jessica Kingsley Publishers.

Tustin, K., Chee, K.-S., Taylor, N., Gollop, M., Taumoepeau, M., Hunter, J.,
        Harold, G., & Poulton, R. (2012). *Extended baseline report: Graduate
        Longitudinal Study New Zealand*. Retrieved from
        http://www.glsnz.org.nz/

Tydén, T., Svanberg, A. S., Karlström, P. O., Lihoff, L. & Lampic, C. (2006).
        Female university students' attitudes to future motherhood and
        their understanding about fertility. *European Journal of
        Contraception and Reproductive Health Care, 11*(3),181–189.
        https://doi.org/10.1080/13625180600557803

Ussher, S. R. (2015). *Women and careers: New Zealand women's engagement
        in career and family planning* (Master's thesis). University of
        Waikato.

Virtala, A., S. Vilska, T. Huttunen, and K. Kunttu. 2011. Childbearing, the
        desire to have children, and awareness about the impact of age on
        female fertility among Finnish university students. *European
        Journal of Contraception and Reproductive Health Care*, *16*(2), 108–
        115. https://doi.org//10.3109/13625187.2011.553295

Whitten, A. N., Remes, O., Sabarre,K-A., Khan, Z. & Phillips, K. P. (2013).
        Canadian university students' perceptions of future personal
        infertility. *Open Journal of Obstetrics and Gynecology, 3*, 561–568.
        https://doi.org/10.4236/ojog.2013.3710

Willett, L. L., Wellons. M. F., Hartig, J. R., Roenigk, L., Panda, M.,
        Dearinger, A. T., Allison, J., & Houston, T. K. (2010). Do women
        residents delay childbearing due to perceived career threats?
        Academic Medicine, 85(4), 640–646.
        https://doi.org/10.1097/ACM.0b013e3181d2cb5b