Has the effect of parents' education on child's education changed over time?

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Abstract

This paper examines whether the expansion of higher education has reduced inequality by providing more opportunities for students from less privileged backgrounds or further entrenched existing inequalities. Using father's education and mother's education to indicate class membership, I examine the salience of Maximally Maintained Inequality theory and Relative Risk Aversion theory with respect to the likelihood of having a university degree. Having a university educated parent is used as a proxy for being a member of the privileged class based on the assumption that the children of university educated parents are more likely to take advantage of opportunities to acquire higher education. I find that the expansion of higher education has had little impact on the association between parent's education and child's education. Respondents with a university educated parent continue to be more likely to have a university degree than other respondents. Expansion has, however, improved the odds for women with respect to higher education.

Keywords: Higher education, inequality, mobility

Introduction

Between 1980 and 2005 the number of Australians studying at university more than doubled due to both structural change and expansion (Marks and McMillan 2007: 354). Prior to 1989, tertiary education was offered at universities, colleges of advanced education and technical colleges. The reforms instituted in 1989 led to the creation of new universities as colleges of advanced education and technical colleges were amalgamated and rebadged as universities. These structural changes were accompanied by the introduction of the Higher Education Contribution Scheme (HECS) which was designed to lessen the financial cost to the government of funding the expansion of the higher education sector (Chapman 1997; Marks and McMillan 2007).

Whether this expansion decreased the level of educational inequality is still the subject of some debate. Although there is general agreement that the actual costs of higher education do not deter students from low socioeconomic backgrounds from participating, there is evidence that a disproportionately low proportion of these students actually participate. In other words, 'the privileged classes manage to maintain their advantage over time' (Arum et al. 2007:29).

Researchers investigating the relationship between social class and higher education generally agree on two points. Firstly, that the abolition of up-front fees by the Whitlam government in 1974 did not lead to a dramatic increase in the number of students from low socioeconomic backgrounds. Secondly, that the introduction of HECS in 1989 did not serve as a deterrent to students from low socioeconomic backgrounds (Chapman 1997; Marks and McMillan 2003). These findings seem to suggest that the cost of higher education is not a marked determining factor as to whether or not high ability students from low socioeconomic backgrounds attend university. International research tends to support these findings making it difficult for policy makers to provide an environment in which students of high ability, regardless of their family's social position, will see the value in continuing their education.

There are two theories that may shed light on why the relationship between social class and higher education has not been affected by the expansion of the higher education sector: the Maximally Maintained Inequality (MMI) theory and Relative Risk Aversion (RRA) theory. Maximally Maintained Inequality argues that before the impact of social class on educational attainment can be reduced, 'saturation' among the privileged class needs to be achieved (Raferty and Hout 1993:57). Therefore, educational expansion will not necessarily reduce educational inequality. If the increase in opportunities only allows more students from the privileged class to enter

higher education rather than encouraging others to enrol at university, there will be no change in the relative proportions of students from the various social class positions (Arum et al. 2007: 31). An increase in the number of students from low socioeconomic backgrounds will only occur when all of the students from the privileged class are accommodated and supply of university places continues to exceed demand. That is, when 'saturation' is reached and the expanding sector needs to attract greater numbers of students from low socioeconomic backgrounds to fill universities.

According to Raferty and Hout (1993:53) students from lower socioeconomic backgrounds are less likely to complete high school, transitioning out of the education system before reaching any barriers to higher education. Therefore, neither the abolition of fees nor the re-introduction of fees would have much of an effect on the inclination of students from low socioeconomic backgrounds to attend university.

Researchers using Relative Risk Aversion theory to explain the continued association between social class and higher education argue that inequalities in educational attainment persist because students are more concerned with avoiding downward mobility than with achieving upward mobility (Breen and Goldthorpe 1997; Goldthorpe 1996; Goldthorpe and Breen 2007; Holm and Jaeger 2008). Breen and Goldthorpe (1997: 283) argue that parents seek to ensure that their children 'acquire a class position at least as advantageous as that from which they originate'. Van de Werfhorst and Hofstede (2007:403) tested RRA theory finding that children from all social backgrounds were equally concerned with maintaining their social position and avoiding downward mobility. They also found evidence of a strong correlation between having highly educated parents and wanting to achieve university qualifications. This provides support for RRA's argument that middle class children

have higher educational aspirations because they require more education than working class children to achieve the same social class position as their parents.

RRA further argues that if the costs associated with pursuing education at a higher level than that needed to avoid downward mobility outweigh the gains, then class inequalities in educational attainment will persist. That is, if the costs associated with university fees and resources, foregone earnings and the risk of failure, outweigh the benefits of moving into a higher social class there is little incentive for working class students to pursue higher education (Holm and Jaeger 2008:200). Holm and Jaeger (2008) found that the higher the father's social position, the higher the respondent's level of education.

In this paper I examine the association between the education of the respondents and that of their parents using data from three Australian surveys conducted between 1987 and 2005 to examine whether the effect of parent's education on child's education has changed over time. In other words, has the expansion of higher education during the last four decades lessened the effect of parents' education on child's education?

Method

The data analysed in this paper are derived from three nationally representative surveys. The 1987-88 NSSS (National Social Science Survey) collected data from 1663 respondents using a self-complete mail-out questionnaire (Kelley et al. 2009). The 1994 NSSS collected data from 1378 respondents using a self-complete mail-out questionnaire (Kelley et al. 2009). The 2005 Neoliberalism, Inequality and Politics Project collected data from 1623 individuals using computer assisted telephone interviews (Western et al. 2005). Each of the three surveys was designed to collect

cross-sectional data. Thus, there is no relationship between respondents in each of the datasets.

Dependent variables

The dependent variable, respondent's education, divides respondents on the basis of whether or not they have completed a university degree and is included in the analysis using a dummy variable coded 1= university degree.

Independent variables

The predictor variables relate to the education of the respondent's parents. Father's education measures whether or not the respondent's father has a university degree and is coded 1= yes, has university degree. Mother's education measures whether or not the respondent's mother has a university degree and is coded 1= yes, has university degree. Three control variables are also included in the analysis: gender, type of school attended and birth cohort. For the purposes of the logistic regression analyses they are all presented in dummy variable format. Gender is coded 1= female. School type is coded 1= attended non-government school.

Four dummy variables define birth cohort: born before 1940, born between 1940 and 1954, born between 1955 and 1969, and born after 1969. The four birth cohorts divide respondents into groups that reflect the changes that have taken place during the latter half of the twentieth century. The higher education rate for the first cohort was particularly low. The second cohort finished secondary school during the era when up-front fees were payable. The third cohort finished secondary school after the Whitlam government abolished up-front fees in 1974. The final cohort started their

university studies after the introduction of HECS in 1989 (Chapman 1997). The reference category is 'born before 1940'.

Respondents less than 21 years of age at the time of the survey were dropped from the analytical sample on the basis that it would be unlikely for them to have acquired a university degree. Respondents who were missing on birth year were also dropped from analytical sample. The descriptive statistics for the variables are reported in Table 1.

Table 1. Proportion of respondents in each category of the variables

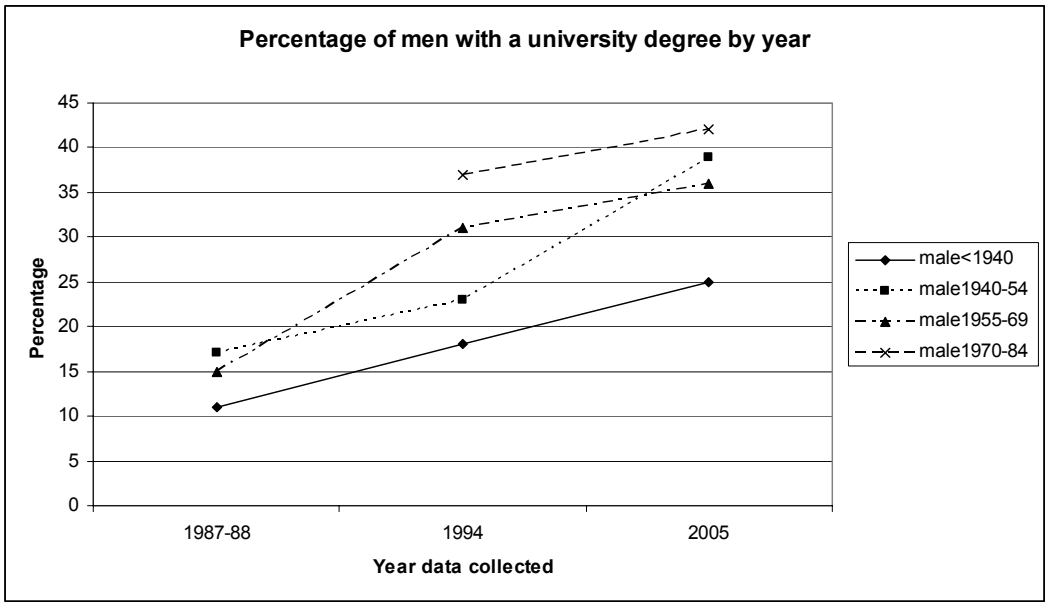
Variable	**1987**	**1994**	**2005**
	n=1537	n=1375	n=1552
Sex:			
Male	0.50	0.53	0.46
Female	0.50	0.47	0.54
Birth Cohort:			
<1940	0.35	0.28	0.22
1940 - 1954	0.35	0.35	0.31
1955 - 1969	0.30	0.31	0.30
1970 - 1987	..	0.06	0.17
Education:			
University degree 1=yes	0.11	0.21	0.32
Father with university degree 1=yes	0.07	0.07	0.12
Mother with university degree 1=yes	0.03	0.03	0.07
Type of school 1= non-government	0.27	0.25	0.28

Although the overall sample has equal proportions of men and women, men are slightly over-represented in 1994 and women are slightly over-represented in 2005. In 1987, the sample is relatively evenly spread across the first three birth cohorts. In 1994, a small proportion of respondents were born after 1969 (0.6) with the remainder evenly spread across the first three cohorts. In 2005, one fifth of respondents were born before 1940, one third were born between 1940 and 1954, one third were born between 1955 and 1969 and the remainder (0.17) were born after 1969. There is a gradual increase in the proportion of respondents with a university degree. The proportion of respondents with a university degree increased from 0.11 in 1987 to 0.32 in 2005. The proportion of respondents with a university-educated father

increased from 0.07 in 1987 to 0.12 in 2005 and the proportion of respondents with a university-educated mother increased from 0.03 in 1987 to 0.07 in 2005. The proportion of respondents who attended a non-government school remained relatively stable.

To determine the strength of the linear relationships between each of the independent variables, I conducted collinearity tests. Table A1 in the Appendix shows that all of the values are less than 0.5 indicating that collinearity is not an issue in these analyses.

Figure 1. Proportion of men with a university degree by year



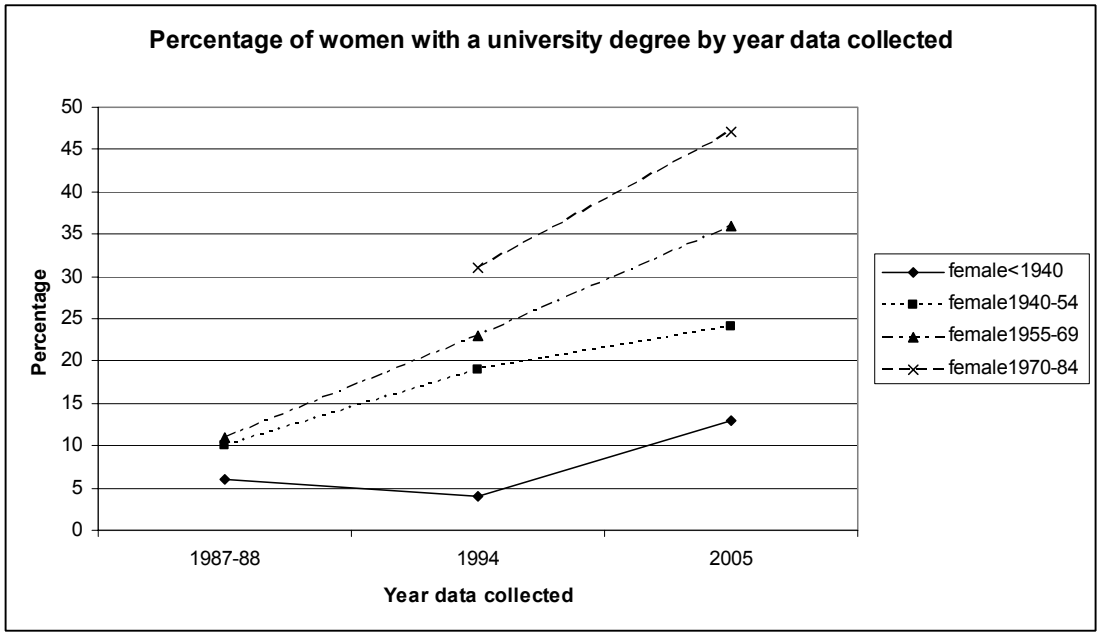
Note: There were no respondents born between 1970 and 1984 in the 1987 survey.

The consequences of the rapid expansion of the higher education sector are clearly evident in Figure 1 and Figure 2. Figure 1 shows the percentage of men in each birth cohort who had a university degree by year data were collected. The percentage of men born before 1940 who had a university degree increased from 11 percent in 1987 to 25 percent in 2005. The percentage of men born between 1940 and 1954 who had a university degree increased from 17 percent in 1987 to 39 percent in 2005. The

percentage of men born between 1955 and 1969 who had a university degree increased from 15 percent in 1987 to 36 percent in 2005. The percentage of men born between 1970 and 1984 who had a university degree increased from 37 percent in 1994 to 42 percent in 2005.

Figure 2 shows the percentage of women in each birth cohort who had a university degree by year data were collected. The percentage of women born before 1940 who had a university degree increased from 6 percent in 1987 to 13 percent in 2005. The percentage of women born between 1940 and 1954 who had a university degree increased from 10 percent in 1987 to 24 percent in 2005. The percentage of women born between 1955 and 1969 who had a university degree increased from 11 percent in 1987 to 36 percent in 2005. The percentage of women born between 1970 and 1984 who had a university degree increased from 31 percent in 1994 to 47 percent in 2005. (Similar results were achieved using the AuSSA 2005 data- see Table A.2 in Appendix).

Figure 2. Proportion of women with a university degree by year



Note: There were no respondents born between 1970 and 1984 in the 1987 survey.

These results suggest that by 2005 men and women in the third cohort were equally as likely to have a university degree and that the youngest cohort of women were more likely to have a university degree than the youngest cohort of men. Breen and Goldthorpe (1997; 2007) also found evidence of a decline in gender differentials in educational attainment arguing that the expansion of education in advanced societies had allowed women within each social class to achieve similar levels of education as their male counterparts.

To examine the relationship between university education and the predictor and control variables, I conduct logistic regression analysis using a series of models separately for each year data were collected. I then combine the three years of data to examine whether the effects of the independent variables change over time by including interaction terms for each of the independent variables and year data were collected. In the Results section, I refer to odds ratios (relative risk ratios) rather than coefficients.

Results

Table 2 shows the odds ratios for the association between the predictor and control variables with the likelihood of a respondent having a university degree versus not having a university degree in 1987, 1994 and 2005. The constant refers to a respondent born before 1940. Model 1 shows that women were less likely to have a university degree than men. In each year respondents with a university-educated father were more likely to have a university degree themselves. The effect of father's education lessened somewhat over time with the odds ratio declining from 5.9 in 1987 to 2.7 in 1994 and 2005. This suggests that although there continued to be a

statistically significant association between father's education and respondent's education, the magnitude of this association declined over time.

Table 2. Odds ratios from logistic regression for university degree versus no university degree: 1987, 1994 and 2005

	Model 1			Model 2		
	1987	1994	2005	1987	1994	2005
	odds ratio	odds ratio	odds ratio	odds ratio	odds ratio	odds ratio
Female	0.54***	0.64***	0.72**	0.44*	0.19***	0.41**
Father's education	5.90***	2.67***	2.73***	5.98***	2.72***	2.79***
Mother's education	0.79	1.83	2.43***	0.80	1.82	2.46***
Private school	3.00***	2.00***	1.84***	3.03***	2.04***	1.86***
Birth Cohort						
<1940 -reference						
1940-1954	1.54*	2.04***	2.05***	1.52	1.35	1.98*
1955-1969	1.62*	2.74***	2.40***	1.31	1.85*	1.59
1970- 1984	..	2.81***	2.91***	..	1.65	1.57
Interactions						
Female 1940-1954				1.05	4.14**	1.14
Female 1955-1969				0.70	3.86**	2.42*
Female 1970-1984				..	5.24*	3.27**
n=	1537	1375	1551	1537	1375	1551
Pseudo R2	0.1097	0.0761	0.0835	0.1114	0.0844	0.0916

*p<0.05 ** p<0.01 *** p<0.001

Mother's education is not significant in 1987 or 1994 but is highly significant in 2005 when having a university-educated mother increased the respondent's odds of having a university degree by 2.4, net of other factors. Attending a non-government school is also significant in each year. The association between birth cohort and university education shown in Figures 1 and 2 is confirmed with those born in the later cohorts being more likely to have a university degree.

The results for sex, parent's education and attendance at a non-government school hold in Model 2 when the interaction terms for sex and birth cohort are included. Model 2 shows that the association between birth cohort and university education varies by sex. Men born between 1940 and 1954 interviewed in 2005 were more likely to have a university degree than men born before 1940 as were men born

between 1955 and 1969 interviewed in 1994. The association for women is more consistent. Women interviewed in 1994 who were born after 1954 were more likely to have a university degree than women born before 1940 as were women born after 1954 who were interviewed in 2005.

The Pseudo R2 indicates that these variables account for around 11 percent of the variation in 1987, 8 percent in 1994 and 9 percent in 2005. Therefore, these independent variables are predicting less of the variation in education in 2005 than they were in 1987. Whether these differences are statistically significant will be explored in the final phase of the analysis.

To examine whether the effects of the independent variables have changed over time, I merge the three datasets and include a time variable. Initially, I included three-way interaction terms for sex, time and each of the predictor and control variables, two-way interaction terms for sex and each of the predictor and control variables and two-way interaction terms for time and each of the predictor and control variables in the model. Interaction terms that did not produce statistically significant results were progressively dropped from subsequent models. The three-way interaction terms for time and sex and the two-way interaction terms for time were not significant and neither were the two-way sex interaction terms for father's education and mother's education. Therefore, in the final model I include only the two-way interaction terms for sex and attendance at a non-government school and sex and birth cohort.

Model 1 in Table 3 shows that women were less likely than men to have a university degree. This effect did not change over time. As predicted by the literature, there is evidence that both men and women were more likely to have a university degree in 2005. Men and women interviewed in 1994 were twice as likely, and men and women interviewed in 2005 were three times as likely to have a university degree than men

and women interviewed in 1987. Men and women with a university-educated father were three times more likely to have a degree. Men and women with a university educated mother were twice as likely to have a university degree as were those who attended a non-government school. Those born in later cohorts were more likely to have a degree than those born before 1940.

Table 3. Odds ratios from logistic regression for university degree versus no university degree

	Model 1 odds ratio	Model 2 odds ratio
Female	0.66***	0.38***
Time		
1987- reference		
1994	2.05***	2.06***
2005	3.31***	3.29***
Father's education	3.22***	3.28***
Mother's education	1.84***	1.85***
Non-gov. school	2.09***	2.30***
Birth Cohort		
<1940- reference		
1940-1954	1.89***	1.63***
1955-1969	2.26***	1.59***
1970- 1984	2.71***	1.47
Sex Interactions		
Female non-gov. school		0.84
Female 1940-1954		1.58
Female 1955-1969		2.35***
Female 1970-1984		3.60***
n=	4463	4463
Pseudo R2	0.1232	0.1284

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Model 2 includes the interaction terms for sex and non-government school and sex and birth cohort. The effect of attending a non-government school is statistically significant for men but not women. Men who attended a non-government school were twice as likely to have a university degree as other men. The effect for birth cohort also differs according to sex. Men born between 1940 and 1969 were more likely to have a degree than men born before 1940, however, there is no effect for men born after 1969. Women born between 1955 and 1969 were twice as likely to have a

university degree as women born before 1940. Women born after 1970 were three and a half times more likely to have graduated from university than women born before 1940. The final model accounts for 13 percent of the variation.

Discussion

The results presented here suggest that the expansion of higher education has not diminished the effect of father's education on child's education. Having a university-educated father had the same effect, that is, it increased the odds of graduating from university, in 2005 as it did in 1987. This confirms the findings of other researchers that socioeconomic background is associated with higher education (Arum et al. 2007; Breen and Goldthorpe 1997; Goldthorpe and Breen 2007; Holm and Jaeger 2008; Marks and McMillan 2007; van de Werfhorst and Hofstede 2007). Although the magnitude of the effect was smaller in 2005, the failure of time interaction terms to produce statistically significant results indicates that this change in magnitude is due to time rather than the interaction between time and father's education. In other words, it is the main effect of time that accounts for the change in the odds ratio rather than the interaction between time and father's education. There is evidence of change in the association between birth cohort and having a university education for women. Women born after 1954 are more likely to have a university degree than women born before 1940 even after controlling for the main effect of sex.

The dramatic increase in the likelihood of being university-educated for women born in the latter cohorts provides support for both MMI theory and RRA theory. According to MMI theory, inequalities in educational achievement will persist until all members of the privileged class (those with a university-educated parent) who want to attend university are accommodated. It is only after 'saturation' level for this

class is attained that an increase in the number of students from the lower classes will occur. RRA theory predicts that people will only invest in their education to avoid downward mobility (Breen and Goldthorpe 1997; Goldthorpe 1996; Goldthorpe and Breen 2007). Students from the privileged class have higher educational aspirations than students from the working class because they need to study longer to acquire the credentials required to maintain their social class position. Putting these two theories together can explain why the expansion of higher education has not diminished the relationship between parent's education and child's education and why women have been taking up higher education in increasing numbers. Women born before 1940 relied on marriage to secure their social class position therefore women from higher social classes did not have to participate in higher education to avoid downward mobility. When higher education expanded in the latter half of the twentieth century, it provided women with an alternative path to secure their social class position. Therefore, it seems likely that it was women from the privileged class who took advantage of the expansion of higher education rather than men from the working class. Breen and Goldthorpe (1997:296) came to a similar conclusion suggesting that changes in the labour market encouraged women from the privileged classes to acquire qualifications for service-class occupations rather than to rely on marriage to suitably qualified men to maintain their social position and avoid downward social mobility.

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Appendix

Table A1. Correlation matrix

	Sex	University	School type	Birth cohort	Father's education
University	-0.06				
School type	0.03	0.15			
Birth Cohort	0.07	0.18	0.01		
Father's education	-0.03	0.24	0.13	0.14	
Mother's education	-0.01	0.17	0.09	0.15	0.38

Table A.2 Percentage of respondents with university degree by birth cohort

Cohort	AuSSA 2005	Neoliberalism, Inequality and Politics 2005
Male<1940	22	25
Male1940-54	21	39
Male1955-69	26	36
Male1970-84	40	42
Female<1940	13	13
Female1940-54	28	24
Female1955-69	37	36
Female1970-84	50	47