

Family Background, Adolescent's Achievement and Aspirations, and Young Adult's Enrolment in Australian Universities

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Resumen

Esta investigación analiza el nivel de acceso de los jóvenes australianos a los estudios universitarios en función de las características de sus entornos familiares. Para ello se han analizado datos de 3.843 mujeres y 3.324 hombres pertenecientes a un estudio longitudinal sobre jóvenes australianos. Los análisis de regresión efectuados ("logistic regression" y "regression surface") indican que: a) existe una fuerte asociación entre las características del entorno familiar y la probabilidad de que los jóvenes australianos cursen estudios universitarios, b) las aspiraciones educativas de los jóvenes actúan, en parte, como mediadores de las relaciones que se establecen entre las características del ambiente familiar, el rendimiento académico de los jóvenes y la probabilidad de que accedan a los estudios universitarios, y c) se aprecian diferencias en las relaciones lineales y curvilíneas que se establecen entre las características del ambiente familiar, el rendimiento académico de los jóvenes, sus aspiraciones y los logros educativos que alcanzan.

Abstract

This study examined the extent that students from different family backgrounds were likely to enrol in Australian universities. Data were collected as part of a longitudinal study of Australian youth (3, 843 females, 3, 324 males). Logistic regression and regression surface analyses indicated that: a) family background and adolescents' academic achievement were related strongly to Australian young adults' likelihood of enrolling in university b) adolescents' educational aspirations mediated, in part, relationships between family background, adolescents' achievement, and the likelihood of enrolling in university, and c) there were family background differences in the linear and curvilinear nature of the relationships among adolescents' achievement, aspirations, and young adults' educational attainment.

Introduction

In a statement related to reforms of the Australian higher education system, the responsible Minister proposed "A confident, strong, quality higher education sector is vital to Australia's economic, cultural, and social development" (Nelson, 2003, p. 8). The Minister also claimed that "Australia's higher education sector enjoys an excellent reputation both at home and in the international arena. The significant number of students who seek to study at our universities here and offshore campuses is evidence of the high regard in which Australian higher education is held" (p. 8). The statement goes on to indicate, however, that Australians from disadvantaged backgrounds remain under-represented in the higher education system.

It is the purpose of this study to present a brief overview of the Australian higher education system and to examine the extent that students from different family backgrounds are likely to enrol in Australian universities.

Overview of the Australian Higher Education System

In 2003-4, the Commonwealth government allocated 2.34% of its total outlays to the funding of Australian higher education. It is expected that in 2004, total university revenues will be 10.9 billion Australian dollars (approx. U.S. \$7.4 billion), with 61 % of that funding being provided by the Commonwealth government (Department of Education, Science and Training, 2002).

For a population of 20 million, in 2003 there were 38 university members (37 public, 1 private) of the Australian Vice-Chancellors' Committee (AV-CC). In addition, there was a further private university and six other higher education institutions funded by the Commonwealth government. There were 896,600 (head count) higher education students, in 2002, with: 64% being full-time; 58% aged between 17-24 years, 54% female; and 70% enrolled in Bachelor degrees. Also, there were 185,000 overseas students with the main source countries being Singapore, Hong Kong, Malaysia, China, and Indonesia.

In relation to students from defined equity groups, the government has indicated that "While the number of available student places [over the past decade] has increased significantly and this has led to a commensurate increase in the number of students from equity groups at university, equity groups have not greatly increased their share of the domestic student population" (Department of Education, Science and Training, 2002, p. 18). The participation of students from low socioeconomic backgrounds, for example, was

14.7% of all non-overseas students in 1991 and 14.6% in 2001. In its response to the government's reform agenda for higher education, the AV-CC has proposed that "substantial contestable Government funding must be made available to universities to support the education of students from under-represented groups" (AV-CC, 2003, p. 16). Because of such concerns about university participation, in this study I examine family background differences in the enrolment of Australian students in universities.

The Likelihood of University Enrolment

Theoretical Framework

One of the persistent challenges confronting societies is how to reduce inequalities in high school retention rates and in the higher education participation rates, of students from different family backgrounds. Rumberger and Thomas (2002, p. 40) observed, for example, that students who "drop out of school suffer from a host of negative consequences, ranging from high unemployment and low earnings to poor health and criminal activity." In a comprehensive analysis using the NELS data sets, Rumberger (1995) indicated that family social status was highly predictive of students' dropping out of school, and that ethnic/race group differences in dropout rates could be explained largely by such family background differences.

The present study of Australian's likelihood of enrolling in university was guided by theoretical frameworks proposed by Bourdieu (1984, 1988) and Goldthorpe (1996). In the development of a field theory of social mobility, Bourdieu suggested that educational success, such as attending university, is associated with two effects that may either reinforce or offset each other. First, there is an inculcation effect that is exerted directly by family social conditions. Second, there is a specific effect related to an individual's system of dispositions that acts as a mediator between family background and educational outcomes. Bourdieu (1984) proposed that "All positions of arrival are not equally probable for all starting points" (p. 110). Although individuals are subject to the forces that structure their social space, they may resist "the forces of the field with their specific inertia, that is their properties which may exist in embodied form as dispositions, or in objectified form, in goods, qualifications, etc." (p. 110).

From an examination of rational action theory, Goldthorpe (1996) suggested that to explain the persistence of social group variations in educational and

occupational attainments, there is a need to differentiate between primary and secondary effects (also see Boudon, 2003). Primary effects are those that create social group differences in initial school achievement. In contrast, secondary effects are “those that come into play as children reach the various transitions or branching points comprised by the educational system and that condition the choices they make” (p. 490). Goldthorpe (1996) proposed:

Even among children who, through the operation of primary effects, reach similar educational standards early in their school careers, secondary effects will still produce class differentials in attainment in so far as these children start from - and view their prospective careers from - differing class origins... it is the influence of secondary rather than of primary effects on attainment that becomes increasingly dominant. (p. 391)

In this investigation, educational aspirations were chosen as an indicator of adolescents' dispositions and as a measure of secondary effects. Aspirations have been shown to mediate substantially relationships between family background and young adults' eventual educational and occupational attainments (e.g., Kao & Thompson, 2003; Marjoribanks, 2002; Schneider & Stevenson, 1999). In addition, gender was included as a predictor of university enrolment, as investigations have demonstrated gender-related differences in associations among family background, individual characteristics, and educational attainment (e.g., Keeves & Slade, 2003; Saha, 2003).

For the present study, the Bourdieu and Goldthorpe theoretical orientations suggested the following hypotheses:

1. Family background and adolescents' academic achievement are related strongly to young adults' likelihood of enrolling in university.
2. Relationships between family background, adolescents' academic achievement, and young adults' likelihood of enrolling in university are mediated by adolescents' educational aspirations.
3. Relationships between adolescents' educational aspirations and young adults' likelihood of enrolling in university are moderated by family background and adolescents' academic achievement.

Method

Participants

The data for the analysis were from the Longitudinal Surveys of Australian Youth, which provided national information on students who were

in Year 9 in 1995 and who were contacted each year until 2000 (Ainley, Marks, & Lamb, 2000)¹. Support for the Longitudinal Surveys was provided by the Australian Government and the Australian Council for Educational Research. Students were selected using a two-stage probability sample framework. First, there was a random sample of 301 schools from across the country and then a random selection of classes was chosen. In this study, the sample included 3,843 females and 3,324 males, who in 2000 had an average age of 20.2 years.

Measures

Family background. During the first survey, the Year 9 students responded to questions about their parents' occupations, and these were coded according to the Australian Standard of Classifications of Occupations (Australian Bureau of Statistics, 1997). Initially, family occupational status was defined by the father's occupation, but where that was missing the occupations of mothers were substituted. From the responses, families were classified as upper occupational status (1,027), upper middle (1,684), lower middle (2,697), and lower occupational status (1,759). In addition, family background was measured by the parents' education. For the analysis, a categorical variable was formed which indicated that at least one parent had completed secondary school (1) or neither parent had completed secondary school (0).

Adolescents' academic achievement. In the initial survey, the adolescents' achievement was measured using mathematics and reading tests devised by the Australian Council for Educational Research. These tests were the LSA Y 1995 Mathematics Test and the LSA Y 1995 Reading Test (Australian Council for Educational Research, 1995a, 1995b). A measure of academic achievement was formed from an equally weighted composite of the two achievement scores, and for the analysis the scores were coded into four categories from lowest to highest achievers.

Adolescents' educational aspirations. In the second (1996) and third (1997) surveys, the adolescents indicated how much education they expected to attain. From the responses, the adolescents' educational aspirations were measured using a six-point scale (1 = leave school as soon as possible; 6 = attend university). For the initial analyses in this investigation, categorical variables were formed which indicated that adolescents expected to enrol in university (1) or had no aspirations for university attendance (0).

University enrolment. In the final survey in 2000, the young adults indicated whether they were enrolled in university, undertaking some other form of educa-

tion, or not involved in any educational activity. From the responses, a binary outcome variable was formed that indicated whether a young adult was enrolled in university (1) or not attending university (0). In the sample, there were 2,840 young adults enrolled at university and 4,327 not attending university.

Results

Logistic Regression Analysis

In the analysis, multistage logistic regression was used to examine the hypotheses. Logistic regression identifies variables that predict whether an event such as enrolment in university, is likely or unlikely to occur. The predictors were added to the logistic regression equations in three stages. First, relations between family background, gender, and the likelihood of university enrolment were examined. Academic achievement was added in the second stage, while the full model included educational aspirations.

For full mediation to occur in the analysis, the associations between family background, academic achievement, and the likelihood of university enrolment would become nonsignificant after taking into account differences in adolescents' aspirations. If relationships were reduced but remained significant, then partial mediation would be demonstrated. In addition, the interactions between the predictors were included in each stage to test for moderation effects, but only the significant interactions have been presented.

In the logistic regression equations, parents' occupational status and adolescents' academic achievement were represented by sets of dummy variables with the reference categories being lower occupational status families and lowest achievement group, respectively. The other predictors: parents' education, gender, and educational aspirations, were coded as binary variables. In the logistic procedure, there are goodness-of-fit statistics that indicate how well successive models improve the degree of fit of the model to the data (Hosmer & Lemeshow, 2000). It is important, as, Cohen, Cohen, West, and Aiken (2003) observed, that such fit statistics should not be interpreted as assessing the proportion of the variance in an outcome measure that is accounted for by a set of predictors. Instead, the logistic measures of R^2 indicate the percentage of null deviance accounted for by a set of predictors, where deviance is a measure of the lack of fit of one model compared to another model. In this analysis, the Nagelkerke R^2 was adopted as it appears to overcome some of the limitations of other Multiple R^2 analogs (Hosmer & Lemeshow, 2000).

In Table 1, the unstandardized logistic coefficients and the exponential coefficients, which reflect the odds of enrolling in university, are presented. The results in Model 1 indicated that after taking into account the other predictors, young adults from upper occupational status families were three times more likely to enrol in university than were young adults from lower occupational status families. In addition, young adults with more educated parents were twice as likely to attend university than were those with less educated parents. Females were more likely to go onto university than were males, with the interaction relationship indicating that females from upper occupational status families were particularly advantaged.

Table 1. *Logistic regression analysis for relationships among family background, academic achievement, educational aspirations, and the likelihood of enrolling in university.*

Predictor variable	Model 1		Model 2		Model 3	
	b	Exp(b)	b	Exp(b)	b	Exp(b)
Family background						
Occupational groups						
Upper status	1.18***	3.24	.94***	2.55	.74***	2.10
Upper middle	.63***	1.87	.44 ***	1.56	.35***	1.41
Lower middle	-.01	.99	-.03	.97	.11	1.11
Lower status (reference category)						
Parents' education	.70***	2.02	.52***	1.69	.30***	1.35
Gender (females = 1)	.40***	1.49	.51 ***	1.66	.29***	1.33
Upper middle x gender	.25***	1.28	.18	1.19	.05	1.05
Academic achievement, 1995						
Highest achievers			2.15***	8.60	1.71***	5.53
Second quartile			1.43***	4.18	.92***	2.51
Third quartile			.82***	2.27	.53***	1.71
Lowest achievers (reference group)						
Educational aspirations, 1996					.93***	2.54
Educational aspirations, 1997					1.99***	7.29
Highest achievers x educational aspirations, 1997					-.39***	.68
Nagelkerke R2	11.8		23.5		45.6	

Note. In each model, the first entry represents the unstandardized logistic coefficient, while the second entry is the exponentiated coefficient or the odds ratio.

In Model 2, the results indicated that the inclusion of adolescents' academic achievement improved the fit of the overall logistic model to the data. The Nagelkerke *R*² showed that the predictors in Model 2 accounted for 23.5% of the null deviance compared to 11.8% in Model 1. After taking into account family background and gender differences, the findings revealed

that adolescents with the highest Year 9 academic achievement were nearly nine times more likely to enrol in university than were adolescents with the lowest achievement scores.

The results in Model 3 showed that the educational aspiration scores from the 1996 and 1997 surveys were related to an extra 22.1% of the null deviance. After taking into account family background, gender, and academic achievement, adolescents with university-oriented aspirations in Year 11 were about seven times more likely to enrol in university than were students with non-university aspirations. In addition, the logistic coefficients in the full model indicated that adolescents' achievement and aspirations only partially mediated the relationships between family background and the likelihood of enrolling in university. Young adults from upper occupational status families, for example, continued to be twice as likely to attend university as were young adults from lower occupational status families. In addition, after taking into account differences in aspirations, young adults with the highest Year 9 achievement continued to be five times more likely to enrol in university than were young adults from the lowest achievement group. The final interaction effect in Model 3, suggested that increases in aspirations for adolescents with the highest achievement scores were not related as strongly to university attendance as were aspiration changes for adolescents in the other achievement groups.

Overall, the logistic regression models revealed that after taking into account achievement and aspiration differences, young adults from upper status families continued to have a greater likelihood of enrolling in university than did young adults from lower status families. Further, adolescents with the highest Year 9 achievement and strongest aspirations had a much greater likelihood of enrolling in university than did other Australian adolescents. The final Nagelkerke R^2 of 45.6% demonstrated that there was a good fit of the final model to the data.

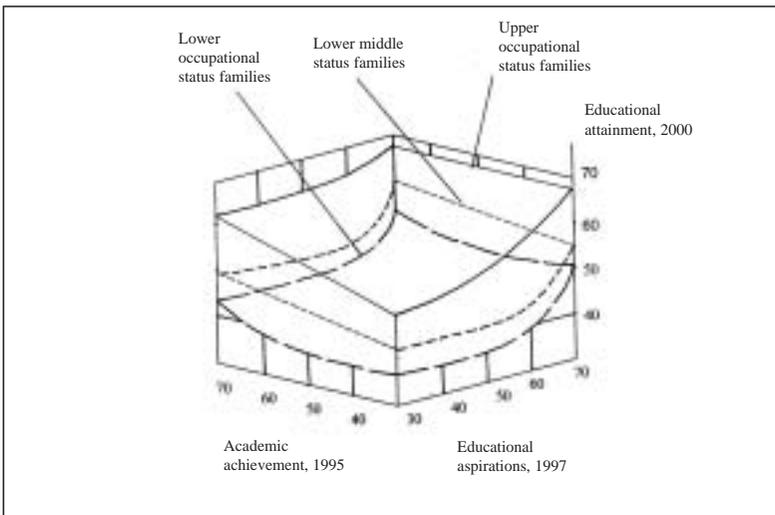
That is, the analysis provided support for the first hypothesis, that the primary effects of family background and adolescents' academic achievement are related strongly to young adults' likelihood of enrolling in university. In addition, the results provided partial support for the second hypothesis, that the secondary effects of adolescents' aspirations mediate relationships between family background, adolescents' academic achievement, and the likelihood of enrolling in university. There was only limited support for the third hypothesis, that relationships between aspirations and university attendance are moderated by family background and adolescents' achievement.

Regression Surface Analysis

The logistic regression analysis highlighted the importance of differences in family background, adolescents' achievement, and educational aspirations as predictors of the likelihood of Australian young adults enrolling in university. It was not possible in the logistic analysis, however, to capture the potential complexity of relationships among academic achievement, educational aspirations, and the educational attainment of the young adults from different family backgrounds. As a result, possible linear and curvilinear relations among the variables were examined by plotting regression surfaces, for young adults from different occupational status families. Surfaces were generated from models of the form: $Z = aX + bY + cX.Y + dx^2 + ey^2 + \text{constant}$, where Z, X, and Y represented measures of young adults' educational attainment (2000), adolescents' academic achievement (1995), and adolescents' educational aspirations (1997), respectively.

Educational attainment was measured on a ten-point scale (1 = did not complete Year 11. 10 = enrolled for a university degree). Academic achievement was the combined score from the Year 9 mathematics and reading tests, while educational aspirations were assessed on a six-point scale (1 = leave school as soon as possible, 6 = enrol in university). The surfaces generated from the regression models are presented in Figure 1, with scores being standardized with means of 50 and standard deviations of 10.

Figure 1. *Fitted-educational attainment scores in relation to adolescents' academic achievement and educational aspirations*



For ease of presentation, surfaces for only three of the four occupational status groups are shown, as they reflect the differences among the groups. The regression surfaces show that in upper and lower middle occupational status families, there were significant and meaningful linear relationships between adolescents' academic achievement and young adults' educational attainment. In contrast, for adolescents in lower status families, academic achievement acted as a threshold variable in relation to later educational attainment. That is, until mean achievement levels were attained, increases in academic achievement were not related to attainment scores. After that threshold value, however, further increments in achievement were related to increases in educational attainment.

The regression surfaces also indicate that the relationships between educational aspirations and educational attainment varied for young adults from the different status groups. A significant interaction relationship is reflected in the shape of the surface for upper occupational status families. At low achievement levels, for example, educational aspirations had a sharply increasing curvilinear association with attainment. In contrast, at high academic achievement scores, increases in aspirations were related to small changes in attainment. The surfaces for lower middle and lower status families indicate that adolescents' educational aspirations acted as a threshold variable in relation to young adults' educational attainment. At each level of academic achievement, until mean aspiration scores were attained, increases in adolescents' aspirations were not related to later attainment scores. After that threshold level was attained, however, further increments in aspirations were associated with sizeable increases in attainment scores. That is, the regression surface analysis revealed family background differences in the linear and curvilinear nature of the relationships among adolescents' academic achievement, educational aspirations, and young adults' educational attainment.

Discussion

The present analysis suggests the general propositions that: (a) family background and adolescents' academic achievement are related strongly to young Australian adults' likelihood of enrolling in university, (b) adolescents' educational aspirations mediated, in part, relationships between family background, adolescents' academic achievement, and the likelihood of enrolling in university, and (3) there are family background differences in

the linear and curvilinear nature of the relationships among adolescents' academic achievement, educational aspirations, and young adults' educational attainment.

That is, the investigation provided initial support for Bourdieu's field theory that individuals' dispositions, such as educational aspirations, partially mediate relations between family background and educational outcomes. In addition, the findings support Goldthorpe's theoretical orientation that secondary effects, such as adolescents' educational aspirations, have a strong association with young adults' educational outcomes after taking into account family background and adolescents' academic achievement. The analyses also indicated, however, that the primary effect of adolescents' academic achievement continued to have a strong unmediated association with enrolling in university.

Kao and Thompson (2003) have observed that the relationship between educational aspirations and eventual attainment remains unclear. The present analysis suggests that for young adults from different family backgrounds and with varying earlier achievement, adolescents' educational aspirations operate differently in relation to young adults' educational attainment. When investigations have examined associations between aspirations and educational outcomes, they have tended to adopt one of two unidirectional models (see Goldenberg, Gallimore, Reese, & Gamier 2001). The first is the 'aspiration-driven' approach, which proposes that the primary relationship is reflected in the influence that aspirations have on educational outcomes. In contrast, the 'performance-driven' model claims that differences in academic performance cause variations in aspirations. The present study indicated: (1) the continuing association between academic achievement and the likelihood of enrolling in university, after taking into account later educational aspirations, and (2) that the relations among achievement, aspirations, and eventual attainment varied for young adults from different family backgrounds. As a result, it might be appropriate to consider a more complete aspiration-performance framework. Such a model might be labelled as the 'family background x aspirations x achievement' model to reflect the ongoing and complex nature of relations among aspirations and achievement measures, for individuals from various family backgrounds.

The Australian government has indicated that barriers to the participation of disadvantaged groups in higher education must be addressed. It is suggested that "Individuals should be enabled to fulfil their potential, regardless of their personal circumstances and backgrounds. Targeted intervention measures and new approaches to student financing will seek to encou-

rage participation and retention of under-represented groups” (Nelson, 2003, p. 11). This study suggests that, in the Australian context, if family background inequalities in higher education participation are to be reduced then attention must be directed at enriching those family, school, and neighbourhood influences that affect children’s early achievement and aspirations.

The analysis suggests, however, that even after addressing such inequities in achievement and aspirations, family background differences in university enrolment are likely to remain. Therefore, there is a parallel need to deal with structural characteristics that may prevent students from certain status groups having access to higher education. Bourdieu (1998, p. 20) suggested, for example, that “by a series of selection operations, the school system separates the holders of inherited cultural capital from those who lack it: the system tends to maintain preexisting social differences.”

Indeed, what is required is the development of family-school-community partnerships that examine those influences that may impede the life chances of children from different family backgrounds. As Martínez González and Corral Blanco (1996) indicated, from such partnerships “the need to establish effective ways to help parents to be involved in their child’s school learning process emerge. These ways could be those of promoting real and friendly *cooperation between families and schools*, and that of *parents’ education for effective parenting*” (p. 81).

Note

¹The data for the study were supplied by the Social Science Data Archives of the Australian National University. It is noted that those who carried out the original investigation bear no responsibility for the further analysis and interpretation of the data that appear in this article.

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