Analyze the relationship between family social status and equality in education

SHIYI PENG

December 16, 2023

Abstract

The realization of true equality in schools requires Governments to adopt comprehensive and integrated measures focusing on the corresponding equitable distribution of resources. However, as social class differences have become wider, the unequal distribution of resources has fundamentally created disparities in students' access to education, undermining the original aim of equitable education. This research identifies the root causes of these disparities through a targeted study of the factors affecting equity in education so that policy makers can make effective interventions to remove the barriers to equal education for all. This paper focuses on analyzing the correlation between fathers' occupational prestige and students' equity in education, and this study concludes that fathers' occupational prestige is a significant factor in whether or not a student receives a diploma[1]. This study analyzed the relationship between family social status, gender and educational equity, emphasizing that educational equity is influenced by social status and that the government should make modifications and interventions in response to current educational policies to promote a more inclusive and equitable education system.

Keywords: Educational Equality, Logical Regression, Family Social Status, Resampling Methods, Irish Education

1 Introduction

Equity in education means addressing the widespread unfair distribution of educational resources and aims to promote a balanced education that recognizes and develops the potential of each learner by providing adequate opportunities, time and resources. At its core, equity in education promotes an equitable and inclusive education system that meets the diverse needs of all learners. However, there are definitely many factors that determine whether students graduate. However, by studying the relationship between family social status, gender and educational level, this article draws valuable conclusions and provides suggestions for the government to take targeted intervention measures. Provide the basis for creating a more equitable and inclusive educational environment for the future. This article will examine the potential correlation between student graduation rates and family socioeconomic status by analyzing the graduation rates of 500 students in a school district[2].

This study examines the link between the educational attainment of 11-year-old schoolchildren in Ireland and their family social status. The study utilizes data in StatLib (originally collected by Greaney and Kelleghan and later reanalyzed by Raftery and Hout) and evaluated using logistic regression models and resampling methods. The research results confirm the significant impact of family social status on students' educational equity. In addition, research also explores the impact of gender on educational equity. The findings showed a significant correlation between a father's occupational prestige score and a student's likelihood of earning a diploma. The higher the father's occupational prestige, the more likely his children are to graduate. Notably, after controlling for fathers' occupational prestige scores, gender differences did not affect whether students received diplomas. The main purpose of this article is to take a closer look at whether current education policies adequately take into account the potential impact of family economic status on student achievement. This discussion aims to provide recommendations for government interventions to ensure that they are targeted and promote an education system that is not only equitable but also inclusive.

In Raftery's article, he notes a decline in class differences regarding educational attain-

ment on a broad scale. However, he emphasizes that class barriers persist, albeit to a lesser extent, owing to the expansion of the education system, which has resulted in reduced selectivity. Despite the government's proposed educational reforms, Raftery argues that they have failed to make a meaningful impact on equal opportunities in education. Consequently, he advocates for the exploration and implementation of more effective alternatives to address these persistent issues[2].I have similar ideas to him,but I plan to use a logistic regression model to detect the correlation between family social status and educational equity, and then use the resampling method to evaluate the performance of the model.The article will delve into two key issues, aiming to explore the correlation between the prestige scores of fathers' occupations and students' achievement of a diploma. Additionally, it will analyze the relationship between students' diploma attainment and gender, while controlling for the prestige scores of fathers' occupations. The dataset under examination consists of 500 observations and encompasses six variables, namely Sex, DVRT, Educational level attained, Leaving Certificate, Prestige score for father's occupation, and Type of school.

The rest of the paper is organized as follows. The adopted statistical analysis methods in Section 2. The Main limitations are reported in Section 3. A discussion concludes in Section 4.

2 Methods

The decision to use logistic regression was based on the fact that the prestige score for father's occupation is a continuous variable. Logistic regression allows for a comprehensive analysis of the association between variables while effectively mitigating potential confounding effects. In summary, logistic regression emerged as a valuable analytical tool in this study, providing a broader methodological approach consistent with the objectives of the study. This approach allows for a nuanced understanding of the impact of various factors (including continuous prestige scores) on the likelihood of outcomes[3].The model looks like this:

Coefficients				
	Estimate	Std.Error	Z value	Pr(≥—z—)
(Intercept)	-1.50539	0.23886	-6.302	2.93e-10
Prestige Score	0.03422	0.00581	5.890	3.86e-09

Table 1: The results of the model coefficient p-value for Q1a

```
Call:
glm(formula = `Leaving Certificate` ~ `Prestige score`, family = binomial(),
    data = df)

Coefficients:
                 Estimate Std. Error z value Pr(>|z|)
(Intercept)      -1.50539    0.23886  -6.302 2.93e-10 ***
`Prestige score`  0.03422    0.00581   5.890 3.86e-09 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 686.86  on 499  degrees of freedom
Residual deviance: 648.29  on 498  degrees of freedom
AIC: 652.29

Number of Fisher Scoring iterations: 4
```

Figure 1: Details report for Q1a

$$log(\frac{\pi}{1-\pi}) = \beta_0 + \beta_1 \times_1 + \beta_2 \times_2 + \cdots \beta_m \times_m \tag{1}$$

where π indicates the probability of an event,and β_i are the regression coefficients associated with the reference group and the explanatory variables. At this point, it is crucial to emphasize an important concept. In this context, I utilized the R programming language to gather and process all the data. Upon importing the data using R, the initial Table 1 and Figure 1 was generated, illustrating the relationship between the father's professional reputation and the student's graduation status.

From the Figure 1, the p-value significantly falls below 0.05, indicating a strong belief that the reputation score of the father's profession influences the student's likelihood of obtaining a graduation certificate.

Conversely,Figure 2 eveals a p-value well above 0.05. Consequently, it is inferred that,

Coefficients				
	Estimate	Std.Error	Z value	Pr(≥—z—)
(Intercept)	-1.691144	0.270324	-6.256	3.95e-10
Prestige Score	0.035223	0.005873	5.997	2.01e-09
Sex2	0.292732	0.189206	1.547	0.122

Table 2: The results of the model coefficient p-value for Q1b

```
Call:
glm(formula = `Leaving Certificate` ~ `Prestige score` + Sex,
    family = binomial(), data = df)

Coefficients:
                  Estimate Std. Error z value Pr(>|z|)
(Intercept)      -1.691144   0.270324  -6.256 3.95e-10 ***
`Prestige score`  0.035223   0.005873   5.997 2.01e-09 ***
Sex2              0.292732   0.189206   1.547    0.122
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 686.86  on 499  degrees of freedom
Residual deviance: 645.88  on 497  degrees of freedom
AIC: 651.88

Number of Fisher Scoring iterations: 4
```

Figure 2: Enter Caption

```
ORDINARY NONPARAMETRIC BOOTSTRAP


Call:
boot(data = df, statistic = bootpvalue1, R = 1000)


Bootstrap Statistics :
        original  bias    std. error
t1* 3.861943e-09       0           0
```

Figure 3: Q2a p-value obtained from resampling

```
ORDINARY NONPARAMETRIC BOOTSTRAP


Call:
boot(data = df, statistic = bootpvalue2, R = 1000)


Bootstrap Statistics :
     original  bias    std. error
t1* 0.1218251       0           0
```

Figure 4: Q2 p-value obtained from resampling

after accounting for the reputation score of the father's profession, there exists no gender disparity among students who successfully attain the graduation certificate.

To rigorously evaluate the model's performance,now we start use resampling methods were employed which install bootstrap package to process self-sampling. This package includes a resampling method crucial for assessing the model's effectiveness.As illustrated in Figure 3, the obtained p-value is notably below the 0.05 threshold. This outcome robustly supports the assertion that the Fathers' Career Reputation Score significantly influences students' likelihood of earning a diploma.This resampling approach provides a robust validation mechanism, ensuring the reliability of the model's predictions and emphasizing the crucial

role played by the reputation score of the father's profession in shaping students' educational outcomes.

Additionally, the compelling evidence presented in Figure 4 reveals the p-value significantly exceeded the critical value of 0.05. This strongly supports and confirms the initial hypothesis. Therefore, the sustained conclusion is that when controlling for fathers' professional reputation scores, whether or not a student receives a diploma is not affected by gender. This finding emphasizes the fact that fathers' occupational reputation, WHICH MEANS the social status of the family is an important factor influencing social equity.

3 Results

Thus, the analysis in this paper leads to a compelling conclusion that there is a positive correlation between the reputation score of the father's occupation and the likelihood of the student obtaining a diploma. It is emphasized that socio-economic status seriously affects children's chances of receiving an equitable education. When gender was taken into account, the conclusions reached further emphasized the serious implications of social class. The results showed that when controlling for father's occupational prestige, gender differences were not correlated with whether or not a student graduated. This finding emphasizes that accounting for differences in socioeconomic status remains a key factor in reaching educational equality. In other words, addressing socioeconomic differences is critical to promoting equal educational opportunities.

In conclusion, this study reveals the relationship between household socioeconomic status, gender, and educational equity, emphasizing the need for governments to enact targeted interventions. By recognizing and addressing socioeconomic disparities, policymakers can pave the way for a more equitable and inclusive educational environment, ultimately fostering a system where every student, regardless of family background, has the opportunity to thrive academically.

4 Discussion

By recognizing and addressing these issues, education systems can move closer to true equality for every student. The relationship between family social status, gender and equity in education requires government interventions. In conclusion, the pursuit of true equality in education also requires a sustained government commitment to comprehensive reforms, and the need to keep up with the collection of school data and feedback from students' parents to the extent that problems in the education system can be identified at first hand. If the government wants to create a favorable educational environment where every student has an equal chance to succeed, regardless of social class or other issues, then it must be proactive in implementing measures.

However, there are some limitations to the article's conclusions. First, the data used in this analysis is too old, which means that the education system may have been updated long ago, and these conclusions do not apply to today's society. In addition, the 500 samples were mainly collected from the same region, which also means that this conclusion is only for this one region and does not provide comprehensive recommendations to the whole government. Therefore, this analysis mainly reflects the education situation of school students in a specific region. In order to obtain more comprehensive results, we need to collect and then analyze the education situation of students in different schools. In essence, while the findings provide valuable insights for a select group of people, it can only serve as a reference phenomenon and is not a conclusion that is applicable to modern society. The next step in the study needs to be to update the data to provide more reliable and dependable information to get conclusions that can be up to date.

References

[1] Kathleen Lynch and John Baker. Equality in education: An equality of condition perspective. *Theory and research in education*, 3(2):131–164, 2005.

[2] Adrian E. Raftery and Michael Hout. Maximally maintained inequality: Expansion, reform, and opportunity in irish education, 1921-75. *Sociology of Education*, 66(1):41–62, 1993.

[3] Sandro Sperandei. Understanding logistic regression analysis. *Biochemia medica*, 24(1):12–18, 2014.