

The Impact of Family Background on Subject Selection in Senior Secondary School Students in the Context of the Reform of College Entrance Examination: An Empirical Study Based on Survey Data from Zhejiang Province

Jianzhen Zhang, Xiaoyu Liang

Zhejiang Normal University, Jinhua 321004, Zhejiang, China

Abstract: Subject selection is one of the key components in the new college entrance examination system. This study analyzed the data from a sample survey of college entrance examination participants in Zhejiang Province between 2017 and 2020 using descriptive statistics, factor analysis, cross analysis, and binary logistic regression in an effort to research into the impact of family background on subject selection and academic achievements in senior secondary school students. Research findings showed that: (i) Students from families of higher social and economic status were more likely to be academically high-achieving; (ii) Student family background had a significant impact on their subject selection, specifically represented by a positive effect of home economic capital on student choice of subjects requiring higher learning costs, a positive effect of family perception of the importance of mathematics, physics, and chemistry on student choice of science subjects, and a positive effect of family cultural environment on student choice of liberal arts subjects; (iii) Personal factors such as gender and academic results are crucial for students' decisions on subject selection, with male and high-performing students showing preferences for science subjects.

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About the Authors: Xiaoyu Liang, College of Geography and Environmental Science, Zhejiang Normal University, Jinhua 321004, Zhejiang, China.

Jianzhen Zhang, College of Geography and Environmental Science, Zhejiang Normal University, Jinhua 321004, Zhejiang, China. E-mail: zjz@zjnu.cn

Correspondence to: Jianzhen Zhang at Zhejiang Normal University of China.

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Introduction

In November 2014, *Implementation Measures for Subject Selection in Zhejiang Province's General College Entrance Examinations* was issued in Zhejiang Province, one of the pilot regions for the reform of college entrance examination (CEE) in China. According to this policy, the "X" in the previous "3+X" model of the CEE was replaced by "selecting three subjects from a range of seven ones." Years of experiences of Zhejiang Province yielded evidence for empirical research on the efficacy of the reform of CEE, and at the same time, issues with subject selection were observed, such as the overly utilitarian mentality, confusion, and anxiety among students during the selection process (Du & Jin, 2016). Do family background disparities lead to differences in decisions on subject selection among students? This article investigated the impact of family origins on student academic performance and subject selection behavior concerning the high-stake examination, based on data from a sample survey.

Research Design and Methods

Sample Selection and Data Sources

This study conducted a questionnaire survey on "How Family Background Affects Students' Selection of Subjects under the New College Entrance Examination System" in Zhejiang Province from June throughout September 2020. Convenience sampling was adopted to obtain data of the CEE participants between 2017 and 2020 from various cities in Zhejiang Province. Among the returned questionnaires, 1119 were valid. The survey questionnaire had four components: basic personal information of the student; the family social, economic and cultural capital questionnaire; the student's choice of subjects for the CEE; the family-related factors scale.

Variable Description

- i. The predicted variable in this study is the individual elective subject being chosen or not, intended to examine the impact of family background on academic performance and subject selection in senior secondary school students.
- ii. Student family background is the explanatory variable, indicated by items related to family social, economic, and cultural status and factors listed in the family-related factors scale. There were five dimensions in this variable: family economic capital; family cultural capital; family education involvement; family social connections; family perception of the importance of mathematics, physics, and chemistry and investments in them.

Model Design

The focus of this study was to examine the relation between student choice of subjects and their family background under the new CEE system. For the predicted variable "the individual elective subject being chosen or not," there were only two options, "Yes"

and “No.” Therefore, it was regarded as a binary variable, and a binary logistic regression model was used to analyze the impact of family background on student subject selection.

Research Findings

Cross Analysis of Student Family Background, Subject Selection, and Academic Performance

Family Background-Induced Differences in Subject Selection

There were significant differences in the choice of physics, geography, and politics, only marginally significant differences in the choice of chemistry, but insignificant differences in the choice of biology, history, and technology among students of differential family origins. Students from families of higher SES were more likely to choose physics.

Family Background-Induced Differences in Student Academic Performance

There were appreciable differences in academic performance at the senior secondary level among students of distinct family origins. Among low-achieving students, 28.8% and 23.1% of them were from underprivileged families and lower-middle-SES families, respectively, and only 13.5% were from advantaged families. At the same time, among the top 10% and 20%-30% of students, the percentages of students from high SES families were 32.8% and 28%, respectively, indicating a positive correlation between family background and student academic results at the senior secondary level.

Preliminary Conclusions

Under the new CEE system, the election of physics, geography, and politics are substantially influenced by family circumstances. Students from higher SES families are more prone to choose physics and geography, but not politics. The higher level of their family SES, the greater the likelihood of the student attaining top-level academic achievements.

Analysis Results of the Binary Logistic Regression Model

- Family economic capital, cultural capital, perception of the importance of mathematics, physics, and chemistry and investments in them significantly impacted student subject selection in the new CEE system.

- Family education involvement and social connections had no significant effects on student subject selection in the new CEE system.
- Gender and academic results in the senior secondary period had considerable effects on student subject selection, whereas the year of CEE participation had a slight impact on student subject selection.

Conclusions

- i. Student academic performance is correlated with their family background. There are prominent disparities in academic achievements among student of differential family origins.
- ii. Student subject selection is affected by family economic capital. Students from economically advantaged families are more prone to choose physics and geography, while those from disadvantaged ones are more likely to pick history, politics, and technology.
- iii. Student choices between science and liberal arts subjects are remarkably affected by family cultural environment and perception of the importance of mathematics, physics, and chemistry.
- iv. Student choices between science and liberal arts subjects are also related to personal factors.

Reference

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