1. Introduction

2. Theoretical framework

2.1 Substantial characteristics of the higher education admission process in Chile

2.2 The effect of context on performance in the admission tests

2.3 A methodological approach that considers the nested structure of data

3. Method

This research was focused on the 2021 admission process to higher education in Chile, the first of two years where the Transition Tests to higher education were applied in replacement of the widely criticized Admission Tests known as PSU. The data sets with the information from students (test enrollment and results, socioeconomic background, applications to universities, and university enrollment) were manipulated and combined to select all relevant variables. Then, different quantitative techniques were conducted to answer the research question.

All analyses were performed using R Statistical Software (v4.2.2; R Core Team 2022). Specifically, the multilevel models were fitted using the lme4 package (v1.1-31; Bates et al., 2022).

3.1 Sample

Originally, 276,059 persons, mainly students just graduated from secondary school, were enrolled to take the admission tests in December 2020. However, based on the research interests, two criteria were applied to set the sample: first, the test takers should have been graduated from a school with the regular curriculum for secondary students, and the 2021 admission process must be the first they participated in. After applying this filter, the sample was more like the target population of the admission tests, students just graduated from regular secondary schools, whose size was 215.019 observations.

3.2 Procedure

Every admission process collects a lot of information from students. In addition to the results of the tests, the Department of Educational Evaluation, Measurement and Registration (DEMRE), the institution in charge of the admission tests, gathers information related to educational and socioeconomic background of the students, up to 10 careers options that they must inform once the test results have been released, and the final decision they made at the end of the selection period.

This information is stored in different databases that can be joined using unique identification variables for students and schools, thus the first step was to organize the relevant variables into one database. From the available information, the educational level of the mother and the father, and the family income were selected as predictors at level 1 (student), whereas at level 2 the type and sector of the schools were the main attributes analyzed.

With the database ready, the first task was searching for incorrect labeling, missing data, cases duplicated, and any other inconvenience for the posterior analyses. Then, some univariate and bivariate analyses were conducted to review descriptives and explore the relationship between the predictors and the dependent variable (score in the mathematics admission test). Given that all the level 1 predictors were categorical, the variables were recoded to have a meaningful interpretation for the intercept in the multilevel model later: an indicator coding scheme was used for the educational level of the mother and the father, whose reference group were the secondary education for both, and sequential coding was used for the family income, thus the slopes at level 1 represent the difference between adjacent categories.

The multilevel modelling started by a model without predictors (called empty model) that was fitted to calculate the Intra-class correlation. Then, different models were fitted for each of the predictors at level 1, testing if more parameters that represent their level 2 variation were needed.

4. Results

5. Discussion

6. Limitations

7. Conclusion

The compositional effect is the extent to which the magnitude of the organization-level relationship, Bb, differs from the person-level effect, Bw. Formally, the compositional effect is:

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The contextual effect is the expected difference in the outcomes between two students who have the same individual SES, but who attend schools differing by one unit in mean SES. As illustrated in Figure 5.2, the contextual effect is the increment to learning that accrues to a student by virtue of being education in School 2 versus School 1.

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By unconflating the fixed component, we see that both the within fixed effect (2.85) and between fixed effect (5.90) are positive and significant, but that there is a contextual effect (5.90 – 2.85 = 3.05) in that the between effect is larger. In other words, overall school-average parent education is more predictive of math scores (in terms of slope magnitude) than is an individual student’s parent education.