Linear models

After assessing the presence of differences in scores between immigrants and natives we tried to understand which features are most important for a student’s scholastic success, to find the optimal way for schools to help lagging students and to have a better integration system.

By focusing our aim on three datasets (European aggregated dataset, Great Britain as the most performing country with respect to integration, and Denmark as the worst one) and using as our target variable the scores of math and reading, we selected the best model through backward selection.

We started with the European dataset to look for general trends: we find out, as we expected, that being an immigrant student, who mainly speaks his language and not the one of the country he lives in, has a negative effect on the student’s scores, as well as having parents who are not highly educated. Moreover, if the student feels bullied at school, he probably lives a bad experience and his grades are affected by this.

But his failures are determined also by the school he studies in: it was clear by looking to the coefficients of the regression, that a school with a shortage of educational material and staff influences its students’ results, especially if they are immigrant who probably need an additional and more careful help from teachers (there’s evidence of this in the coefficient of the interaction immigration:short\_edu\_staff).

On the other side, there are also positive effects, given mostly by the socioeconomic state of the student, both for native and immigrant students.

After that we decided to investigate more deeply the datasets of Great Britain and Denmark, which are respectively the best and the worst country with respect to the differences of scores between native and immigrant students. The aim was to highlight if there are features that are more relevant than the others in determining the gap between the students’ scores and way to live school.

First of all, as we expected, we noticed that the feature ‘immigration’ was not significant anymore in Great Britain, specifying that being an immigrant in this country is not relevant as we already noticed.

However there’s a negative effect on the scores for immigrant students who attend big classes (as we can see by the coefficient of the interaction immigration:class\_size), probably because they are not followed and helped by teachers as they could be in smaller classes.

Furthermore, we observed that Denmark is a less integrative country: the interaction immigration:bullied has a negative effect on the scores, underlining that an immigrant student who feels bullied at school is penalized.

A thing we want to specify and highlight is that all the models we built up are models with an R^2 that reaches the value of 0.30 to the maximum. Indeed, we know that the scores of a students are not only due to the situations he lives in and things that doesn’t depend on him, but it is mostly made of his hard work and study.

EUR

* Immigration : negative effect (-10 circa) -> essere un immigrato ha effetto negativo
* Language : negative effect (-3 circa) -> più non parlo la lingua nativa più vado peggio
* Hisced : negative effect (-6 circa) -> se i genitori sono poco istruiti fai più fatica
* Grade\_rep : negative effect (-71 circa) -> chi viene bocciato va male
* Escs\_status : positive effect (+28 circa) -> se stai meglio economicamente e socialmente allora vai meglio
* Bullied : negative effect (-4,… circa) -> sei bullizzato, vivi male la scuola, vai peggio
* Short\_edu\_mat & short\_edu\_staff : negative effect (-1,… circa) -> con meno materiali e professori allo studente è più difficile andare bene
* Immigration:hisced : negative effect (-1,47) -> per un immigrato i cui genitori sono poco istruiti risulta più difficile andare bene a scuola
* Immigration:short\_edu\_staff : negative effect (-2,68) -> più negative di short\_edu\_staff da solo, quindi per uno studente immigrato essere seguito da un insegnante è di aiuto

DNK

* Immigration : negative effect (-60 circa) -> essere un immigrato ha effetto negativo
* Language : negative effect (-7 circa) -> più non parlo la lingua nativa più vado peggio
* Hisced : negative effect (-5,6circa) -> se i genitori sono poco istruiti fai più fatica
* Grade\_rep : negative effect (-32 circa) -> chi viene bocciato va male
* Escs\_status : positive effect (+34 circa) -> se stai meglio economicamente e socialmente allora vai meglio
* School\_changes : negative effect (-7,6 circa) -> cambiando scuola, devi ambientarti eccetera quindi i voti si abbassano leggermente
* Immigration:bullied : negative effect (-7 circa) -> sei bullizzato, sei anche immigrato, forse sono razzisti, vai peggio -> poca integrazione

GBR

* Non c’è più immigration -> non ha effetto perché in Gran bretagna non è rilevante (avevamo già visto che c’era poca differenza!)
* Escs\_status : positive effect (+25 circa) -> se stai meglio economicamente e socialmente allora vai meglio
* Short\_edu\_mat : negative effect (-8,6 circa) -> con meno materiali e professori allo studente è più difficile andare bene
* Immigration:school\_changes : negative effect (-10 circa) -> cambiando scuola, devi ambientarti eccetera quindi i voti si abbassano leggermente, soprattutto se sei immigrato
* Immigration:short\_edu\_staff : negative effect (-13,7) -> più negative di short\_edu\_staff da solo, quindi per uno studente immigrato essere seguito da un insegnante è di aiuto

GBR, READ

- immigration:class\_size -> Negative effect