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HOW STUDENT CHARACTERISTICS AFFECT MOBILITY CHOICES AT THE UNIVERSITY LEVEL: INSIGHTS FROM TWO SURVEYS IN THE CAMPANIA REGION

Roberto Rondinelli, Valeria Policastro, Concetta Scolorato
Department of Political Sciences, Federico II University of Naples , Naples, Italy

Corresponding author
Roberto Rondinelli, roberto.rondinelli@unina.it

ORCID
Roberto Rondinelli: 0000-0002-8510-8162
Valeria Policastro: 0000-0003-1016-460X

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Abstract *In the context of intellectual migration, student mobility is an important and increasingly studied phenomenon. The Campania region represents a special case among the regions of Southern Italy, as it maintains a certain attractiveness for students. In this regard, a focus on the region's student mobility is proposed through two lines of research looking at the transition from high school to university and the continuation of studies after the bachelor's degree obtained at Federico II University of Naples . The aim is to investigate the effects of individual characteristics, socio-family background, geographic aspects, school/university experience and future prospects on mobility decisions. The logistic models for the probability to move show the importance of the family background in both cases. Geographical aspects seem to be important in the transition from high school to university. Future job prospects offered by Federico II University of Naples seem to be not enough to retain all the bachelor students. Finally, the perceived quality of the bachelor's study experience is not an important determinant in the decision to leave* this *University, but students who decided to move have high expectations for the new university.*

Keywords: *Student mobility, university experience, individual factors, survey.*

1. INTRODUCTION

In the context of migration, student mobility is a crucial social, economic, and decision-making issue. To analyse this phenomenon, many works use secondary data – often available at different levels of aggregation – leaving out individual student characteristics and the specific characteristics of certain territories. This strand of research is part of the broader debate on internal migration from Southern to Northern Italy (Genova et al., 2019), where student mobility - and first labour movements - are almost unidirectional. Motivations behind student mobility are both exogenous and endogenous and are often traced back to individual decision-making (Tosi et al., 2019), whereas movement from Southern to Northern Italy (Attanasio and Priulla, 2020), both to study and work, often has historical motivations. It is interesting to note that the push factor of labour migration is the motivation to improve one's economic condition, while intellectual migration starts from the possibility of making a basic economic investment for future improvement but it can also depend on the local labour market conditions (Dotti et al., 2013).

The Italian region of Campania is an interesting case study because it represents an area where local universities can retain students, yet there also exists incentives to migrate to other regions (Dal Bianco et al., 2010; Giambona et al., 2017). The region also has interesting socio-cultural characteristics worthy of investigation (Ragozini et al., 2016; Santelli et al., 2019). For these reasons, we chose the Campania region as the focus of our study.

To analyse the peculiarities of this phenomenon, following Bacci and Bertaccini (2021), we pursued two lines of research. Specifically, we constructed two ad hoc surveys for Campania's high school and bachelor's degree students with the aim of investigating the individual factors that determine two specific moments of transition when student migration can occur. Since these two mobilities refer to different periods in life, they show differences, but they may reveal some common motivations linked to the individual sphere, geographical aspects (Vittorietti et al., 2023), family, secondary school background (Usala et al., 2023), previous study experience, etc. From this perspective, it is possible to make some comparative reflections.

The logistic regression models performed on the data from the two surveys analyse i) the effect of student characteristics on the probability of being movers from the Campania region to attend university (high school students' survey) and ii) the effect of student characteristics and university experience on the probability to move from the Federico II University of Naples[1] (the most important university in Campania) to pursue a second bachelor's degree or master's degree after their bachelor's degree (university students' survey).

Considering the relevant literature, we hypothesize that the two students' migrations can have different determinants. In the case of high school students, we expect an important effect of geographic location and socio-economic background (related to the family), while for bachelor students, the field of study, quality of university and future job opportunities can be important determinants, even though the two migrations may have similar effects.

The paper is organized as follows. Section 2 gives a general overview of the theoretical background. Section 3 describe the characteristics of the two sample surveys. Section 4 sets out the methods used for the analysis. Finally, Section 5 shows the results.

[1]From now on we refer to it as University of Naples without specifying the name Federico II when it is not necessary.

2. THEORETICAL BACKGROUND

The movement of high school and university students in Italy has been described as a phenomenon associated with intellectual migration. It is seen as a distinct subset of Italy's longstanding internal migration pattern, which has traditionally followed a south-north trajectory (Attanasio and Priulla, 2020).

The phenomenon of intellectual migration has been explored by a large body of literature since the 1990s. These studies have tried to understand how human capital has been distributed within the different geographical areas of the country with consequences for the development of the territories involved (Affuso and Vecchione, 2012). The large proportion of young people from the South who decided to move to the north to start or continue their university studies is part of the more general movement from the south to the centre-north which occurs because they hope it will result in an overall improvement in their quality of life.

This type of migration from south to north, primarily determined by economic reasons, has always characterised Italy. Due to the persistent economic divide in the country, in fact, the south of Italy has maintained its role of subalternity (Bonifazi, 2015).

This migration trajectory characterising Italy was essentially a labour migration and became more substantial between the 1950s and 1970s, i.e. during the so-called economic boom. This phase saw workers from the agricultural areas of the south move to the industrialised regions and cities of Northern Italy in search of a job, which was almost always factory work (Pugliese, 2002). Already at that time, an elite part of the population began to move for educational reasons, giving rise to a new migratory phenomenon alongside the labour one. This migration trend is part of the broader phenomenon of intellectual migration. And although this trend decreased at the end of the 1970s, it began to increase again from the 1990s onwards (Attanasio et al., 2020). From the 2000s until now, the shape of this migration pattern repeatedly changed due to many events, such as reforms of the Italian university system, financial crises and the birth of several online universities (Minerva et al., 2022). The current migration is the product of the succession of events that occurred in Italy in this period.

As the literature on the topic indicates, both exogenous and endogenous factors influence this type of mobility. The exogenous factors include, in decreasing order of importance, the degree of accessibility to the educational facilities both in terms of the cost and quality of the transport system, the cultural environment, amount of leisure time, the cost of rent and the quality of life. Endogenous factors, again in decreasing order of importance, include the presence of faculty members

in line with the chosen educational and professional pathway, the quality of the teaching provided and the quality of the services offered to students (Columbu et al., 2021b; Lombardi and Ghellini, 2019).

In addition to structural factors, which concern the characteristics of the territorial context and those of the university system (Columbu et al., 2021a), there are also the more strictly psychological/personal and social factors that determine the decision to be stayer or mover[2]. Within these factors, we can recognize the predisposition to change the living context in search of a more favourable one with the desire to improve quality of life, the so-called brain drain phenomenon (see Beine et al. (2008)). Another determinant is given by the family's socio-cultural context, as they try to ensure better educational and future employment opportunities for younger generations (Impicciatore and Tosi, 2019). However, to have more profitable long-term results and make young people more inclined towards an independent life, usually, the family needs to make an economic investment. Finally, other factors are attributable to the perception that students have of their overall university experience, their aspirations, and their willingness to travel (Biancardi and Bratti, 2019; Bratti and Verzillo, 2019; Ciriaci, 2014). It is also important to consider that intellectual migration, like any kind of migration, has effects on demographic and economic aspects both in the contexts of departure and arrival.

Recently, researchers have become interested in the specificities of the internal mobility of students in Italy as a process that contributes to reproducing social inequalities and widening the disparities in opportunities between students from the south and the north or between those who come from families with higher levels of education or lower. For example, according to studies by Impicciatore and Tosi (2019), it is evident that parental education represents one of the determinants of students' university choices and that the major cultural resources of families who consider the investment in education as the main opportunity to strengthen one's social status, favour the south-north migratory flow. Conversely, internal mobility in the southern regions is not associated with parental background.

Together with these determinants, even geographical (Vittorietti et al., 2023) and post-graduation aspects can affect the choice of students to be stayers or movers.

In this context, the case of the Campania region has interesting attributes

[2]Movers are the students who have enrolled in universities located in a region different from their residence and who take more than 90 minutes to reach the university, following the definition provided in Silvia et al. (2021), otherwise, they are defined as stayers (Attanasio and Enea, 2019).

compared to other southern regions (Ragozini et al., 2016; Santelli et al., 2019). Campania is, indeed, the most densely populated region in the south and is home to seven universities, two of which (Federico II University of Naples and University of Salerno) attract bachelor graduates from smaller universities. With these contextual characteristics, Campania seems to be the only one among the southern regions to counteract and in some cases reverse the mobility flows of students towards the centre-north by managing to be an attractive pole for university students both from Campania and from other regions. For these reasons, this work explores student mobility in Campania but without specifically investigating south-north movements.

3. SURVEYS

Two major flows of student mobility occur within regions and between regions. In this regard, the Campania region is an interesting case, as compared to other southern regions, it manages to retain a higher percentage of university students (see Santelli et al. 2022, the 2014-2015 cohort has a percentage of stayers equal to 85.8). Only Sardinia shows similar values due to its status as an island (in Santelli et al. 2022, the percentage of stayers is 81.3). For this reason, we implemented two surveys. The first analyses the decision of students to move from the Campania region in the transition from high school to university, and the second the propensity of University of Naples' bachelor students to enrol in another university after their degree. The survey of high school students was conducted in May 2022 until the end of school activities (mid-June), while the survey of bachelor students started in May 2022 and ended in July 2022. In this section, we describe how we sampled for the two surveys.

3.1. HIGH SCHOOL STUDENTS' SURVEY

We considered the national students register ('Anagrafe Nazionale Studenti', in Italian), and through the institute code, we identified 775 schools of the Campania region which include 28 thousand students. The statistical units of our analysis are the secondary school students; to sample them, we considered the schools that are involved in the national project to promote the enrolment in STEM university degree ('Piano Lauree Scientifiche', in Italian). To accomplish the aim of our analysis, we had to sample schools with students more likely to enrol at the university and with a propensity to move to another region. For this reason, we selected only the schools with more than 20 students enrolled at the university and more than 5 students who moved to another region. Finally, we obtained 112

schools with 25 thousand students, which is our reference population.

To be confident about the representativeness of the sample of students, the number of considered schools is calibrated in order to cover 10% of the total population (2500 students).

After the initial skimming, we applied a quota sampling of the schools by type (lyceum, vocational and technical) and province (Naples, Salerno, Caserta, Avellino and Benevento), where their combinations define each stratum, e.g. lyceum - Naples, vocational - Naples, etc. The relative joint distribution of enrolled students was used to calculate the number of students we had to sample from each stratum, while the number of schools that we needed to sample within each stratum to obtain the desired number of students was calculated by the ratio between the number of students to be sampled and the average number of enrolments. The resulting sample of schools did not include any vocational and technical institutes for the provinces of Avellino and Benevento. For this reason, we oversampled to have at least one school for each stratum. The final number of schools included in the sample is 43 (see Figure 1 for an overview of the sampling strategy and Section 7.1.1 in the Appendix for the quota computation).

Data were collected by means of a questionnaire sent by e-mail to the teachers, who administered it to the students. Given this procedure, the negative attitude of students to filling out the questionnaires, the submission of them at the end of the school year, and considering that we only collected data for students in the last two years of school (which number is also affected by school dropout), we obtained an acceptable response rate of 644 answers (26%).

3.2. BACHELOR STUDENTS' SURVEY

Due to privacy issues in accessing the entire list of bachelor students from the seven universities in the Campania region, the survey has been limited to the students studying at the University of Naples Federico II. From them, we selected only the students who had at least 160 ECTS at the time of the survey. The data for the survey were collected through a questionnaire sent by e-mail to the students. The final sample is composed of 1,048 students representing 11.64% of the entire population (9,003), which can be considered a good proportion.

4. METHOD

The purpose of this study is to test the effect of different individual characteristics on Campania students' mobility. Given the literature described above to

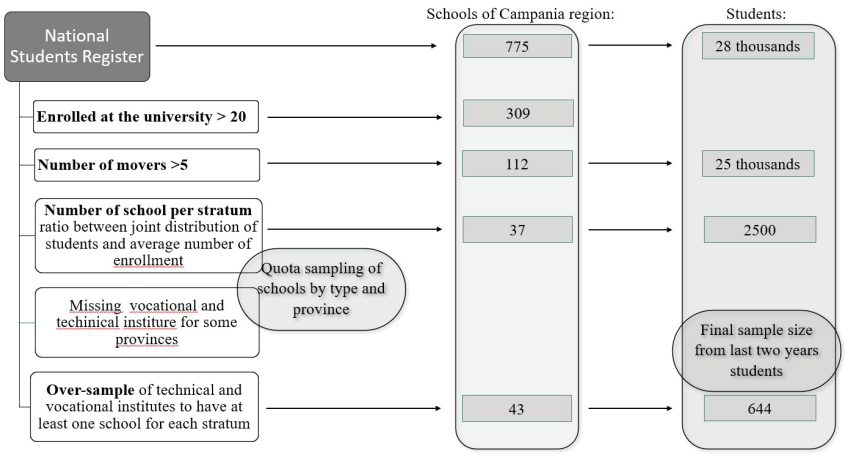


Figure 1: Sampling procedure

explain this phenomenon, we identified four principal aspects: geographical distance, family, quality of the university and future perspectives.

For both cases (high school and bachelor students), we verified the interestingness of the variables describing the above four factors by making use of the information value (IV) (Shannon, 1948) which is designed mainly for variable selection in binary logistic regression. The computation of the information value for each variable j is the following:

$$IV_j = \int ln\frac{f(X_j|Y=1)}{f(X_j|Y=0)}|f(X_j|Y=1) - f(X_j|Y=0)| \ dx. \tag{1}$$

where the first part of the formulation can be defined by the weight of evidence (WOE), which is calculated for each individual i by using the probability as the function:

$$WOE_i = ln\frac{P(X_j|Y=1)}{P(X_j|Y=0)}. \tag{2}$$

where $P(X_j|Y=1)$ and $P(X_j|Y=0)$ are respectively the percentage of a generic characteristic given the individual belongs to the group of movers or stayers. For this reason, IV is essentially a weighted sum of all the individual WOE_i, where the weights are the absolute differences between the numerator and the denominator.

Generally, an *IV* value less than 0.1 refers to those predictors with a weak relationship to the movers/stayers' odds ratio; an *IV* value of between 0.1 and 0.3 identifies a medium relationship, *IV* between 0.3 and 0.5 denotes a strong relationship, while a *IV* value higher than 0.5 represents a suspicious relationship that needs to be verified.

The variables pertaining to the four investigated aspects and with the highest *IV* are included in the logistic regressions (Agresti, 2012) which we computed for the two cases (high school and bachelor students). In the case of high school students, the response variable is the probability of moving from the region to attend university; in the case of bachelor students, the response variable is the probability of moving from the University of Naples after finishing a bachelor's degree. The following equation identifies the model:

$$P(Y=1) = \frac{e^{\mathbf{X}\beta}}{1-e^{\mathbf{X}\beta}}. \tag{3}$$

where $\mathbf{X}$ is the matrix of the covariates we selected through *IV* , while β is the vector of parameters to be estimated.

5. ANALYSIS AND RESULTS

In this section, we show the results of our analysis for both case studies. Section 5.1 focuses on the empirical evidence for high school students, while Section 5.2 focuses on bachelor students. For both, we briefly discuss the composition of the sample, the variable selection via *IV* and the interpretation of the statistical models.

5.1. HIGH SCHOOL STUDENTS

To perform the analysis, we selected only students who intended to go to the university. To the question concerning the region of the university the students intended to enrol, they answered 'Campania' or 'Other region'. We excluded the students who were uncertain.

After this filtering, the final sample consisted of 389 students: 304 (78.1%) stayers and 85 (21.9%) movers. Approximately 66.3% were female, and 31.4% were male, while the remaining indicated 'Other' or 'Do not want to declare'. A majority of the students attended a lyceum (scientific 36.8%, classic 11.8%, and other 21.1%), 16.2% were in technical institute, but only 0.3% attended vocational

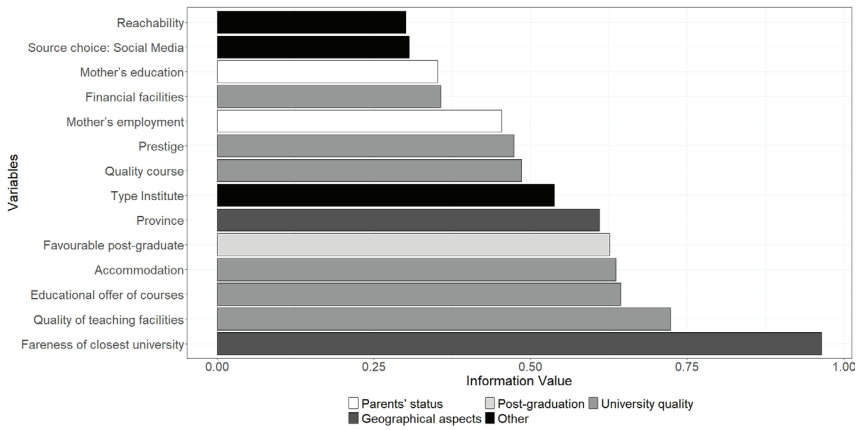


Figure 2: Variables with an *IV* value higher than 0.3

institutes. The rest of the students were from other institutes. Finally, 34.7% were in their fourth year of study, and 65.3% were in their fifth.

The variables[3] depicted in Figure 2 have the highest *IV* values (more than 0.3), including variables strongly (*IV* between 0.3 and 0.5) and suspiciously related (*IV* higher than 0.5) to the response variable. Since the characteristics identifying the four investigated dimensions have a very high *IV*, the logistic regression model is useful to detect whether they statistically affect the probability of students moving from their home region to attend university.

Table 5[4] shows the results for the seven different models. Together with the four dimensions of interest described in Section 4, we added 'gender' as a control variable. The first column (1) refers to the complete model (*Model 1*), while the second (2) describes the selection of the important variables from *Model 1* concerning the four dimensions. The remaining five columns concern respectively the models of geographical aspects (*Model 3*), parents' status (*Model 4*), university quality (*Model 5*), post-graduation (*Model 6*) and other variables of interest (*Model 7*). According to the Bayesian information criterion (*BIC*), the geographical aspect denoted by the variables included in the *Model 3* is the most important dimension to explain the phenomenon. Overall, *Model 2*, including at least one variable for each of the four dimensions, turns out to be the best model (with the lowest value of *BIC*).

Focusing on this model, the geographical aspect seems to be important for

[3] See the Appendix (Section 7.1.2) for their description.

[4] See the Appendix (Section 7.2) for the model estimation.

the decision to move towards another region. When the distance to the closest university in the region of the student increases, the probability of being a mover increases: for 'more than 1 hour', the probability to move is 0.84, while for 'until 1 hour' and 'fewer than 30 minutes', the probability to move is low (respectively 0.26 and 0.23), denoting a propensity to remain in the region. This is also evident from the 'Province' variable, which highlights the low propensity to be a mover (0.2) for students who live in the Naples province. However, not in all cases does living in this province ensure being close to the university, so this result can be linked to the perception of the student to be near the university. This is due to the importance of Naples city and to the number of universities based in it (4 of the 7 universities in the Campania region are in Naples). To conclude, when students live far away, or they perceive to live far from the closest university, they prefer to leave the region.

For what concerns the family effect, we found a statistically significant contribution of the mother's employment status. When the mother is employed, the probability to be a mover is 0.82. This finding can be explained by two different reasons: the family can afford the economic investment aforementioned in Section 2 and the student may be more accustomed and inclined to an independent life. When only the family dimension is analysed in *Model 4*, the mother's educational status becomes more important in explaining the response variable.

Generally speaking, the post-graduation perspective is not yet driving the decision of high school students to move out of their region, probably because they feel the work world is something very distant. However, this is not verified when this variable is included in the simple regression *Model 6*, which is also the one with the second highest *BIC*, denoting a spurious explanatory power.

The quality of the university is only important for the following variables: accommodation, quality of courses on offer and quality of teaching. For all three the probability to move is slightly higher than 0.5 (respectively 0.543, 0.541, 0.562). For *Model 5*, this denotes that aspects related to the university facilities and subject of the courses are a bit more important than economic and prestige factors ('Financial support', 'Prestige', and 'Quality of course').

The covariates of *Model 7* do not include any variables of the four dimensions, and, although we found some significant effects, this is the model with the highest *BIC*.

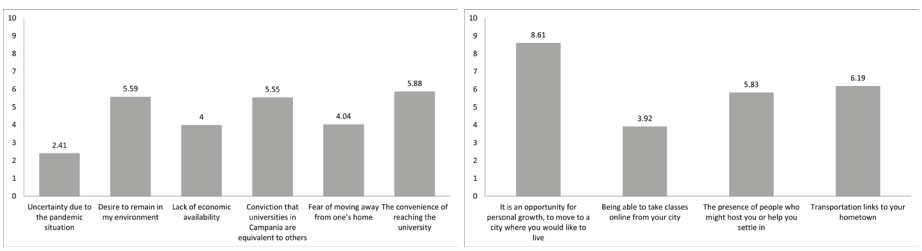
The last thing to underline is that both *Models 1* and *2* do not show any significant 'Gender' effect on the probability of being a mover from the Campania region to attend university.

To provide a more straightforward result, we constructed a typical profile for a student who has a high propensity to move outside the region. A student who lives outside the Naples province, who has a commute of over one hour to the nearest university, who has an employed mother and who believes that the quality of the facilities, accommodation and quality of education are important has a probability to move of 0.97.

To conclude this section, we will discuss some of the descriptive statistics that the models did not take into account. In the sample used for the construction of the models, the majority of students were enrolled in the fifth grade (65.4%). For the students who intended to move to a different region, this percentage decreased significantly (47.7%). This finding shows that the choice to stay in the region is influenced by contextual factors. The decision to move in this regard is more characteristic of fourth-year students. They will face the choice of the university to enrol in the year after, so their answers are driven by their aspirations.

Comparing the personal motivations of students who choose to stay in the region with those who decide to leave, it is once again evident that the decision to stay is not significantly influenced by personal factors but by environmental ones.

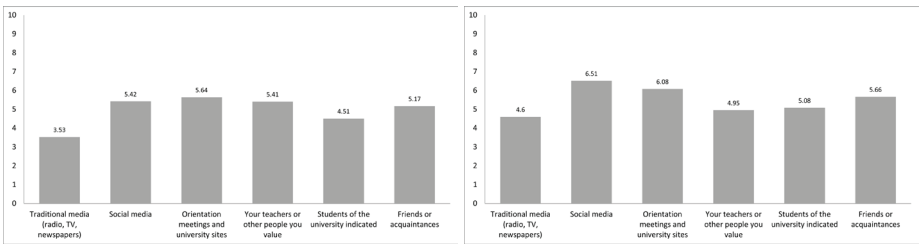
Figure 3: Answers to the question: 'How much do the following factors influence your choice?' The left plot depicts the stayers, while the right plot depicts the movers.



Indeed, on a scale from 0 to 10, none of the modalities reported in the left panel of Figure 3 show a clear predominance in the decision, except to a slight extent for 'Desire to stay in my environment', 'Conviction that universities in Campania are equivalent to others' and 'Convenience of reaching the university' (the latter attributed to the importance of the geographic aspect). In other words, those who choose to stay, in part, seem to do so passively, partly being aware of the context they come from and in which Campanian universities are situated. Yet students who intend to go outside the region clearly recognize it as 'an opportunity for personal growth, to move to a city where you would like to live', but at

the same time, they remain anchored to their roots ('Transportation links to your hometown').

Figure 4: Answers to the question: 'Can you indicate how important the following sources of information were in your decision to enroll in the university you indicated?' The left plot depicts the stayers, while the right plot depicts the movers.



These two different approaches to decision-making are also evident in the usage of information sources (Figure 4). Indeed, for all the sources considered, on average, students who decide to go outside the region tend to give them more consideration than the stayers.

5.2. BACHELOR STUDENTS

As in the previous case study, we selected only the students who intended to continue their university studies after their bachelor's degree (another bachelor's, master's or professional master's degree). To the question about where they would undertake future studies, they knew which university to enrol (whether University of Naples or another).

After this filtering, the final sample consisted of 469 bachelor students who had at least 160 ECTS: whose 332 (70.8%) were stayers, and 137 (29.2%) were movers. Approximately 55.3% were female, and 42.2% were male; the remaining indicated 'Other'. A majority of them were from the Campania region (94%). Before their bachelor's, they mainly studied at a lyceum (scientific 46.3%, classic 18.1%, and other 12.8%); 11.1% of them were from a technical institute, and only 2.3% attended vocational institutes. The rest were from other institutes. The most common areas studied for the bachelor's degree were humanistic disciplines (26.8%), engineering (25.5%) and economics and statistics (17%).

In contrast to Figure 2, the variables[5] depicted in Figure 5 include the ones

[5] See the Appendix (Section 7.3.1) for their description.

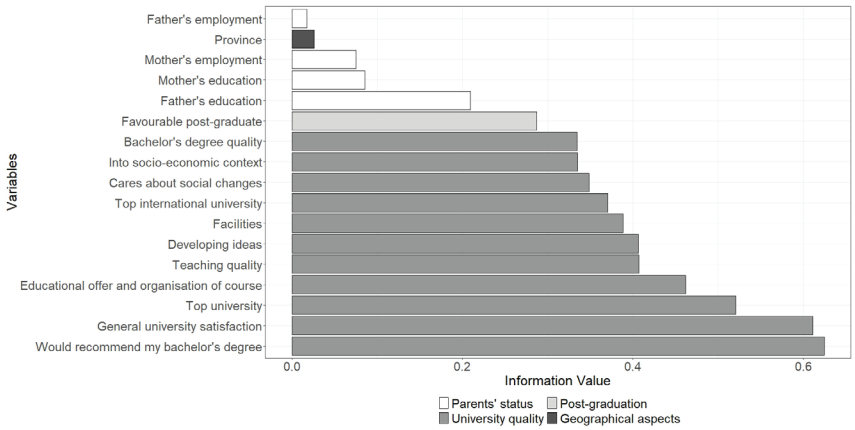


Figure 5: Variables with an *IV* value higher than 0.3 and other variables from dimensions of interest

with the highest *IV* values (more than 0.3) and other variables that are important for all four dimensions.

The six models[6] depicted in Table 6 investigate the determinants of outgoing mobility from University of Naples, using a similar approach to Section 5.1. Together with the four dimensions of interest described in Section 4, we added the 'Gender', 'Abroad study periods' and 'Scientific area' as control variables. The first column (*Model 1*) refers to the complete model, while the second (*Model 2*) describes the selection of the important variables from *Model 1* concerning the four dimensions. The remaining four columns regard respectively the models of geographical aspects (*Model 3*), parents' status (*Model 4*), university quality (*Model 5*), and post-graduation (*Model 6*). According to the *BIC* value, *Model 2*, including at least one variable for each of the four dimensions, is clearly the best model. We should point out that the model assesses only the movement out of University of Naples and not the entire region, but we continue to refer to outgoing students as movers because University of Naples is the largest university in the south of Italy (as well as Campania) and also because only 10% of the outgoing students stay in the region.

The family variable has a large effect on moving: the probability of moving from University of Naples is 0.74 for students with a university-graduated father and 0.66 for students with an employed mother. Obviously, the higher the level

[6]See the Appendix (Section 7.3.3) for the model estimation.

of the father's education can be an important incentive for the student to have new experiences, as well as graduate from a top university outside of the region. Furthermore, the dynamics of the mother's employment status are comparable to the ones we just described in Section 5.1, but with a weaker effect visible in *Model 4* where the parameter is not significant. The perceived quality of University of Naples is based on the students' undergraduate experience. Both in the selected model and in the full one (*Model 1*), we did not notice any important effect of this dimension, except for 'Would recommend my bachelor's degree' (movers do not consider the University of Naples to be of poor quality, but overall, they do not recommend their bachelor's degree). Students who do not recommend their bachelor's degree are more likely to be movers from University of Naples: in *Model 2*, the probability related to 'More no than yes' is 0.88, while for 'Definitely not', it is 0.8. *Model 5* shows a slightly negative effect of considering the University of Naples as 'Top international university' on the probability of being a mover (0.44). The same effect is observed for the possibility of having 'a more favourable post-graduate work environment' when studying at University of Naples. In this case, the parameter is significant in *Model 1*, *Model 2* and *Model 6*, with the probability of moving from University of Naples being around 0.42. As for the models of Ta-ble 5, we did not find any gender effect, while we observed an important effect of studying abroad during bachelor's degree that, as expected, has a positive and sig-nificant impact on the probability of moving from the University of Naples (in *Model 2*, it is 0.86). Finally, a fundamental difference was found for 'Scientific area', where the effect of the reference category ('Socio-economic sciences') on the probability to move is positive as we found negative effects for all the other areas ('Health sciences', 'Humanities' and 'STEM'). This result can be related prob-ably to the fact that, in the economic area, University of Naples is not perceived at the same high level as other universities; on the contrary, University of Naples seems to keep students in the other scientific areas (Health sciences 0.126, Humanities 0.214, STEM 0.226). To conclude, the perceived quality of the University of Naples has a minor impact on the choice of students to move from it. In contrast, the father's educational and mother's employment status, the specific propensity of students to want new experiences, the field of study and future perspectives, are very important factors. Although the perceived quality of the specific charac-teristics of the University of Naples did not significantly affect the choice to move, the students who decided to enrol in another university to continue their studies would not recommend their bachelor's. Compared to high school students, the choice of bachelor students seems to be driven by more personal and qualitative

reasons due mostly to their experiences and awareness rather than contextual motivation. In this regard, the motivations of bachelor students are more complex (the second best *BIC* is for the full model); indeed, the territorial aspect ('Province') disappears, and the mother's employment status decreases in effect.

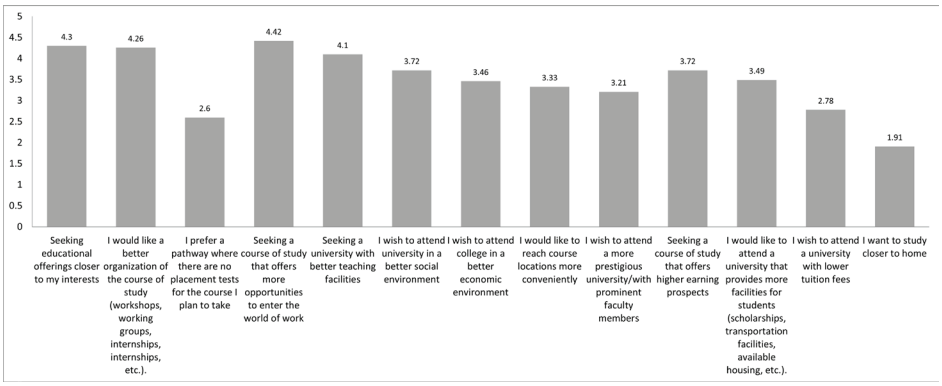
As for the high school students survey, we constructed a typical profile for a bachelor student who has a high probability of moving from the University of Naples to continue his studies. A student who has been abroad for a study period, who comes from a socio-economic scientific area, who has a highly educated father and who believes that University of Naples can not guarantee a favourable post-graduate work environment has a probability to move of almost 1 (0.99).

Comparing the entire sample and the bachelor students who decided to leave the University of Naples, the scarce importance of the geographical distance is con-firmed by the answers to the question: 'How long does it take you to get to Uni-versity of Naples from your home residence?'. Actually, we observed similar frequency distributions, that are respectively for the entire sample and the movers as follows: 'fewer than 30 minutes' (4.4% and 7.9%), 'between 30 and 59 min-utes' (39.2% and 38.1%), 'between 60 and 120 minutes' (37.6% and 34.9%), and 'more than 120 minutes' (18.8% and 19.1%).

At the same time, the question 'Would you have liked to study at a university located in a different city from your current one?' denotes a problem related to the city that may need further investigation. We observed a consistent difference between the whole sample and the movers from University of Naples: in the first case, the distribution shows a prevalence of 'No' of 69.4%, in contrast, in the second case, the distribution shows a prevalence of 'Yes' of 52.6%.

Finally, a question specifically asked to students who intend to move from University of Naples, requires special attention: 'Express your degree of agreement/disagreement (from 0 to 5) with respect to the following statements regarding your choice to continue your studies'. Since the choice of undergraduate students seems less related to the quality of University of Naples and to be more complex than that of high school students, this question may be useful at a descriptive level to detect preferences and desired characteristics for the new destination (Figure 6). Not surprisingly among the five most agreed statements are 'Seeking a course of study that offers more opportunities to enter the world of work' (the most agreed, 4.42 on average) and 'Seeking a course of study that offers higher earning prospects' (3.72), which confirm the importance of post-graduate work possibilities. At the same time, although we observed from the models that the quality of University of Naples has not significantly affected the probability of

Figure 6: Answers to the question 'Express your degree of agreement/disagreement (from 0 to 5) with respect to the following statements regarding your choice of further education.' The plot depicts the opinions of movers from University of Naples.



moving from it, Figure 6 shows the high expectations of students with respect to the new university. Among the five most agreed statements were 'Seeking educational offerings closer to my interests' (4.3), 'I would like a better organization of the course of study' and 'Seeking a university with better teaching facilities'.

6. DISCUSSION AND CONCLUSIONS

The two surveys discussed in this study represent the first effort to collect data at the individual level and study the phenomenon of students' mobility for the peculiar case of the Italian region of Campania using microdata.

Based on this initial empirical evidence, the mobility of high school and bachelor students respectively from Campania and Federico II University of Naples is driven by the motivations we indicated in Section 1 as a research hypothesis, namely that the Campania students' mobility seems associated with the four dimensions we wanted to test. Understandably, family and geographical distance are characteristics that drive the transition from high school to university, while the choice of bachelor students seems clearer and depends very much on their previous experiences, scientific area and future perspectives.

Specifically, in the first case, high school students move from their home region for three main reasons: the quality of courses and structures, the economic possibility of the family (employed mother works like a proxy of that) and if they live far away from the closest university of Campania. In the second case, students

move from the University of Naples Federico II when, based on their experience, they would not recommend their bachelor's degree, so they prefer to change university to increase the probability of being employed in the future. Usually, they have spent periods studying abroad during their first degree.

Overall, high school and bachelor students showed different behaviours in the choice to move for future studies. The mobility choices after the bachelor's degree is an additional migration with respect to the one already acted after the high school. Their motivations are then different and are driven by the university experience. While the decision-making process of high school students seems to be directed by intrinsic needs and conditions (including economic ones), the case of bachelor students, as above described, is even more complex and depends on different evaluations strictly related to the improvement of study conditions and their experiences. As evidence of this, we have seen that the choice of high school students is mostly related to the context in which they live, namely, their family and the distance to the closest university (more generally, geographical aspects), whereas, the decisions of University of Naples bachelor's students are more mature and conscious due to their prior experience and are, therefore, more complex.

Considering the movers, from the response to the specific question about the university they will attend in the future, they have a propensity to move to the northern part of the country (Rome and above). For this reason, we can also comment on the results in terms of south-north migration. In this regard, the results we have found are expected and in line with those of Santelli et al. (2022, 2019). In summary, we can highlight the following results: socioeconomic disparities (primarily influenced by family circumstances) influence the choice to move after high school; there is a migration trend among high school students that is somewhat driven by their geographical location; there is an anticipatory migration of bachelor students before entering the workforce, consistently following the south-north direction; finally, probably due to employment opportunities, students in the socio-economic sciences field are more inclined to emigrate.

In comparison to existing literature, using microdata, we can add that the quality of Federico II University of Naples and the courses offered is perceived as acceptable; indeed, it is not a significant factor in migration decisions. However, students expect very high standards from other universities, especially concerning employment prospects. These prospects seem to be influenced by factors external to the university itself and are more closely tied to the market context in which the university is situated.

In conclusion, as usually happens for surveys on specific topics, this work has its limitations. Questionnaire response rates could be improved by covering the limitation in collecting data, as described in Section 3.1; this could facilitate the estimation and interpretation of results. Second-level variables could be considered, and their potential effects on student migration could be tested. The analysis of south-north movements requires further exploration in the future by collecting more specific data on the migration destination.

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7. APPENDIX

7.1. HIGH SCHOOL STUDENTS: QUOTA SAMPLING, LIST OF VARIABLES AND MODELS

Following the computation of quota for the sampling strategy (Section 7.1.1), the list of the variables (Section 7.1.2) used in the logistic models, their distributions (Section 7.1.3), and the table with the estimated logistic models (Section 7.2).

7.1.1. QUOTA COMPUTATION

Table 1: Relative distribution of high school students, considering only the schools with more than 20 students enrolled at the university and more than 5 students that moved to another region (25000 students).

	Lyceum	Vocational	Technical	Total
Avellino	0.053	0.000	0.006	0.059
Benevento	0.035	0.001	0.005	0.041
Caserta	0.139	0.002	0.023	0.164
Napoli	0.455	0.004	0.078	0.537
Salerno	0.174	0.003	0.022	0.199
Total	0.855	0.010	0.134	1

Table 2: Number of students to sample in each stratum to reach a total sample of 2500.

	Lyceum	Vocational	Technical	Total
Avellino	134	0	15	149
Benevento	87	2	14	103
Caserta	347	5	58	410
Napoli	1137	11	195	1342
Salerno	434	8	55	497
Total	2138	26	336	2500

Table 3: Average number of enrolled students in one institute per stratum

	Lyceum	Vocational	Technical	Total
Avellino	67.6	0.0	37.8	62.6
Benevento	73.6	22.0	34.8	61.4
Caserta	121.0	27.0	44.9	94.3
Napoli	100.9	26.8	43.7	83.3
Salerno	95.4	38.0	42.9	82.3
Total	97.9	28.8	43.0	81.8

Table 4: Quota sampling of schools. The ratio between the number of students (Table 2) and the average number of students per stratum (Table 3).

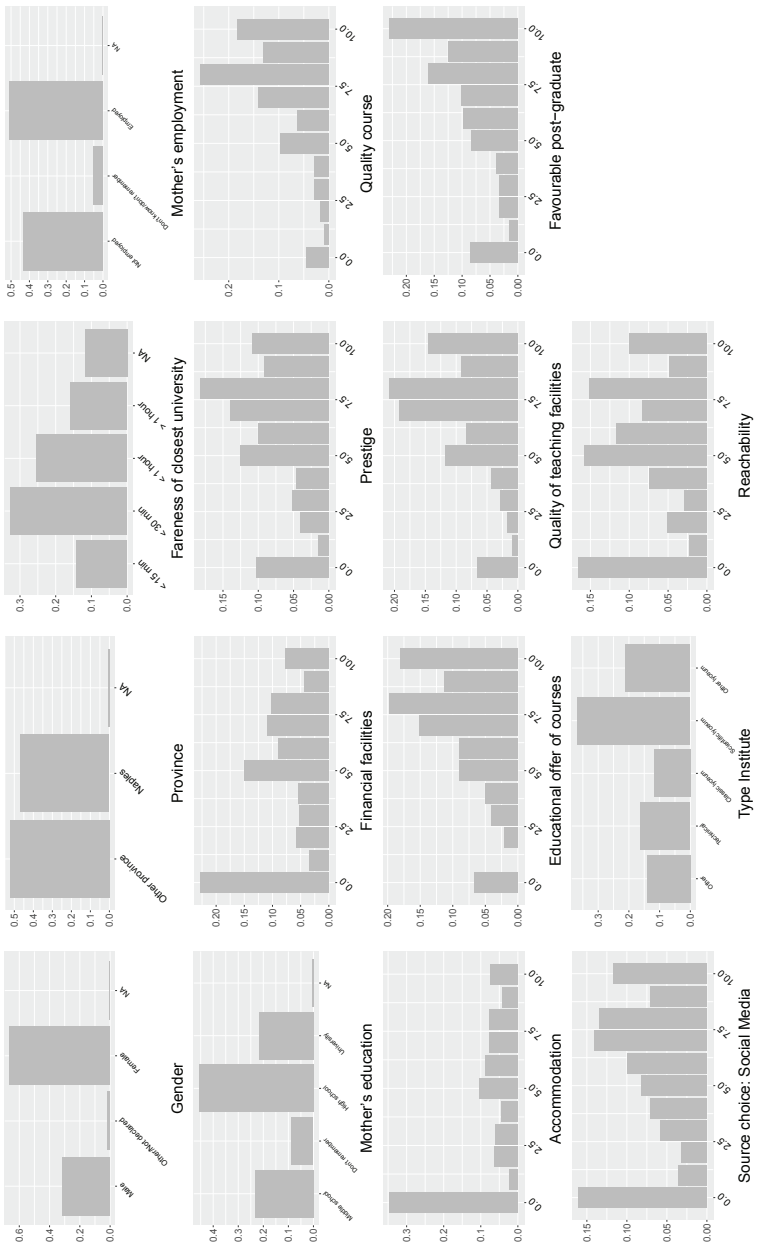
	Lyceum	Vocational	Technical	Total
Avellino	2	0	**1**	3
Benevento	1	**1**	**1**	3
Caserta	5	**1**	1	7
Napoli	17	**1**	3	21
Salerno	6	**1**	1	8
Total	31	**4**	7	42

7.1.2. LIST OF VARIABLES

The following is the list of variables depicted in Figure 2 and that are used in the logistic regression models of Table 5, where we include the additional control variable 'Gender'.

- Gender (**Gender**)
- Province of residence (**Province**)
- How far is the university in your region most easily accessible from your home? (**Distance of closest university**)
- Mother's employment status (**Mother's employment**)
- Mother's educational qualification (**Mother's education**)
- Prestige of the university (**Prestige**)
- Which factors influenced your choice of the university you intend to enrol in? (consider that 0=not at all and 10=very much)
  - The financial support (scholarships, student accommodation, etc.) (**Financial support**)
  - The quality of the degree course you will choose (**Quality course**)
  - The presence of available university accommodation (**Accommodation**)
  - The educational offer of available courses (**Educational offer of courses**)
  - The quality of the locations and teaching facilities (**Quality of teaching facilities**)
  - A more favourable post-graduate work environment (**Favourable post-graduate**)
  - The convenience of reaching the university (**Reachability**)
- Can you indicate how important the following sources of information were for your decision to enrol at the university you indicated? (consider that 0=not at all and 10=very much): Social media (**Source choice: Social media**)
- Attended Institute (**Institute type**)

7.1.3. DESCRIPTIVE PLOTS OF THE VARIABLES



7.2. LOGISTIC REGRESSION MODELS OF THE PROBABILITY TO MOVE TOWARD ANOTHER REGION TO ATTEND UNIVERSITY

Table 5: Logistic regression models of the probability of moving toward another region to attend university.

	Dependent variable:						
	Mover from Campania Region						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	−6.715***	−5.202***	−0.671**	−2.692***	−4.955***	−3.144***	−2.104***
	(1.485)	(1.039)	(0.315)	(0.400)	(0.787)	(0.491)	(0.525)
Gender ***Other/Not declared***	0.664	1.531					
	(1.793)	(1.736)					
Gender ***Female***	0.184	−0.070					
	(0.574)	(0.456)					
Province ***Naples***	−0.924*	−1.389***	−1.683***				
	(0.545)	(0.434)	(0.367)				
Distance of closest university ***<30 min***	−0.895	−1.190**	−0.945**				
	(0.635)	(0.546)	(0.455)				
Distance of closest university ***<1 hour***	−1.076*	−1.066*	−0.961**				
	(0.653)	(0.592)	(0.479)				
Distance of closest university ***>1 hour***	1.614**	1.647***	1.637***				
	(0.642)	(0.552)	(0.436)				
Mother's employment ***Don't know/don't remember***	1.418	0.981		−0.327			
	(1.169)	(1.073)		(0.812)			
Mother's employment ***Employed***	1.270**	1.501***		1.047***			
	(0.514)	(0.451)		(0.316)			
Mother's education ***Don't remember***	0.962			0.795			
	(0.930)			(0.609)			
Mother's education ***High school***	0.995			0.796*			
	(0.697)			(0.425)			
Mother's education ***University***	1.052			1.263***			
	(0.758)			(0.464)			
Prestige	0.046	0.011			0.047		
	(0.099)	(0.096)			(0.073)		
Financial support	0.043	−0.026			−0.055		
	(0.088)	(0.077)			(0.058)		
Quality course	−0.158	−0.098			−0.058		

Table 5: Logistic regression models of the probability of moving toward another region to attend university.

	Dependent variable:						
	Mover from Campania Region						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(0.135)	(0.117)			(0.096)		
Accommodation	0.226***	0.171**			0.165***		
	(0.079)	(0.069)			(0.054)		
Educational offer of courses	0.153	0.165*			0.224***		
	(0.115)	(0.097)			(0.081)		
Quality of teaching facilities	0.299**	0.250*			0.221**		
	(0.135)	(0.127)			(0.100)		
Favourable post-graduate	0.082	0.087				0.252***	
	(0.086)	(0.079)				(0.059)	
Reachability	−0.297***						−0.138***
	(0.077)						(0.045)
Source choice: Social Media	0.102						0.181***
	(0.075)						(0.049)
Institute type	−0.057						−1.683**
Technical	(1.089)						(0.829)
Institute type	1.265						1.576***
Classic lyceum	(0.927)						(0.534)
Institute type	0.741						0.844*
Scientific lyceum	(0.834)						(0.454)
Institute type	0.575						0.006
Other lyceum	(0.807)						(0.509)
Observations	314	318	341	386	334	338	340
Log Likelihood	−80.496	−93.006	−129.499	−184.177	−144.961	−164.705	−151.978
Akaike Inf. Crit.	210.991	218.013	268.999	380.355	303.922	333.410	317.955
Bayesian Inf. Crit.	304.726	278.2054	288.1584	404.0899	330.5996	341.0564	344.7579

Note: *p<0.1; **p<0.05; ***p<0.01

Model (1) Complete model
Model (2) Selection of important variables from complete model
Model (3) Geographical aspects mode
Model (4) Parents' status mode
Model (5) University quality model
Model (6) Post-graduation model
Model (7) Other varialbes model

Table 5: Logistic regression models of the probability of moving toward another region to attend university.

	Dependent variable:						
	Mover from Campania Region						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Reference categories:	Gender (***Male***) Province (***Other province***) Distance of closest university (***< 15 min***) Mother's employment (***Not employed***) Mother's education (***Middle school***) Institute type (***Other***)						

7.3. BACHELOR STUDENTS: LIST OF VARIABLES AND MODELS

7.3.1. LIST OF VARIABLES

The following is the list of variables depicted in Figure 5 and that are used in the logistic regression models of Table 6, where we include the additional control variables 'Gender', 'Abroad study periods' and 'Scientific area'.

- Gender (**Gender**)
- Did you study abroad during your studies? (**Abroad study periods**)
- What is the scientific area of the course you are attending at University of Naples Federico II? (**Scientific area**)
- Province of residence (**Province**)
- Father's educational qualification (**Father's education**)
- Mother's educational qualification (**Mother's education**)
- Father's employment status (**Father's employment**)
- Mother's employment status (**Mother's employment**)
- How satisfied are you with the following features of University of Naples Federico II?
  - The educational offer and organisation of course (**Educational offer and organisation of course**)

  - The quality of teaching (**Teaching quality**)
  - About the services offered (**Facilities**)

- How much did the following factors influence your choice of being enrolled at Federico II University of Naples? (consider that 0=not at all and 5=very much): The quality of the degree course (**Bachelor's degree quality**)

- Thinking about Federico II University of Naples , how much do you agree with the following statements?

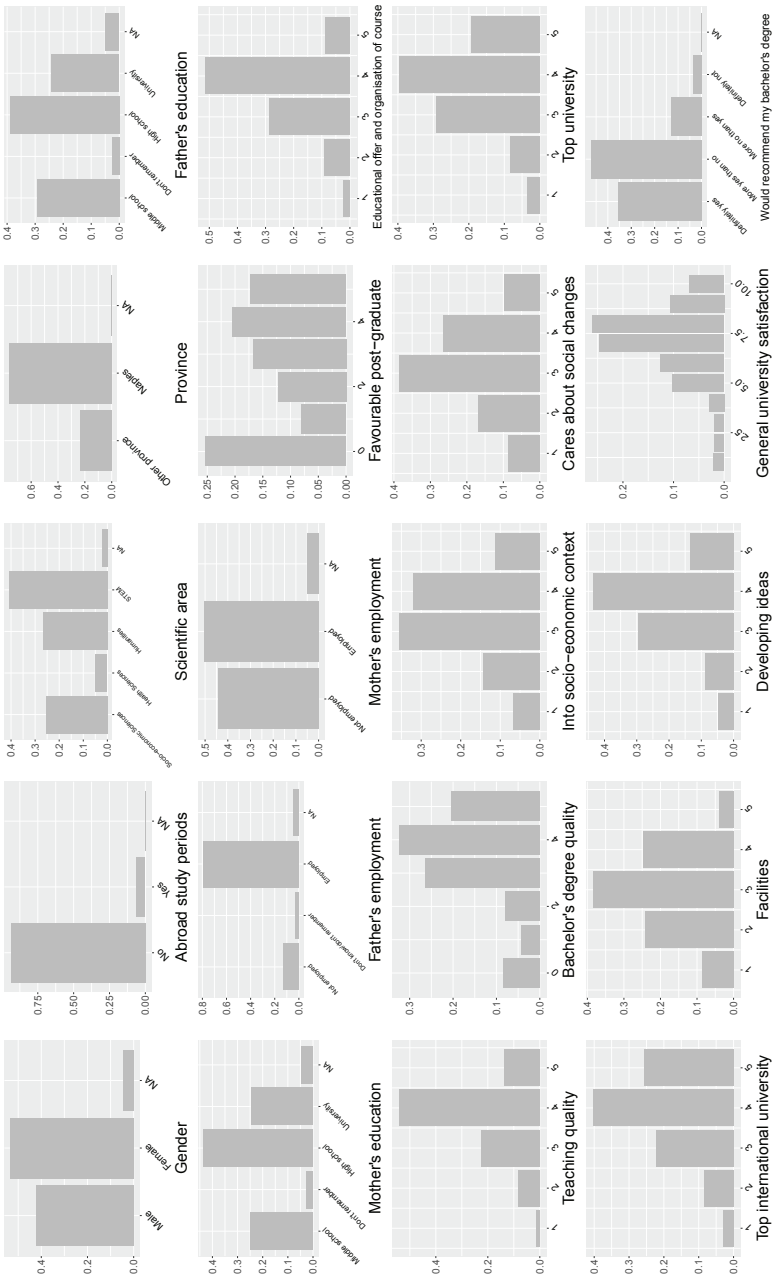
  - It is inside a socio-economic context. (**Into socio-economic context**)
  - It is attentive to changes in society (**Cares about social changes**)
  - It is a first-class university (**Top university**)
  - It is a university whose prestige is recognised internationally (**Top international university**)
  - It is a place for the development of new ideas (**Developing ideas**)

- Express your overall satisfaction with Federico II University of Naples by assigning a number from 1 (not at all satisfied) to 10 (fully satisfied) (**General university satisfaction**)

- Based on your experience, would you recommend your degree course at Federico II University of Naples ? (**Would recommend my bachelor's degree**).

- How much did the following factors influence your choice of being enrolled at Federico II University of Naples ? (consider that 0=not at all and 5=very much): A more favourable post-graduate work environment (**Favourable post-graduate**)

7.3.2. DESCRIPTIVE PLOTS OF THE VARIABLES



7.3.3. LOGISTIC REGRESSION MODELS OF PROBABILITY TO MOVE FROM UNIVERSITY OF NAPLES FEDERICO II AFTER BACHELOR DEGREE

Table 6: Logistic regression models of the probability of moving from Federico II University of Naples after bachelor's degree.

	Dependent variable:					
	Mover from University of Naples Federico II					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.378	−0.116	−1.185***	−1.669***	1.284	−0.241
	(1.237)	(1.047)	(0.224)	(0.380)	(0.921)	(0.162)
Gender	0.287	0.243				
Female	(0.290)	(0.274)				
Abroad study periods	1.841***	1.779***				
Yes	(0.543)	(0.520)				
Scientific area	−1.872**	−1.934***				
Health Sciences	(0.753)	(0.716)				
Scientific area	−1.275***	−1.300***				
Humanities	(0.388)	(0.368)				
Scientific area	−1.152***	−1.230***				
STEM	(0.333)	(0.325)				
Province	0.306	0.348	0.389			
Naples	(0.353)	(0.335)	(0.252)			
Father's education	1.394	0.868		1.369*		
Don't remember	(0.980)	(0.840)		(0.798)		
Father's education	0.342	0.338		0.455		
High school	(0.358)	(0.337)		(0.292)		
Father's education	1.275***	1.058***		1.286***		
University	(0.431)	(0.366)		(0.348)		
Mother's education	−1.321			−1.869		
Don't remember	(1.407)			(1.201)		
Mother's education	−0.255			−0.254		
High school	(0.365)			(0.293)		
Mother's education	−0.580			−0.433		
University	(0.463)			(0.377)		
Father's employment	0.805	0.607		0.589		
Don't know/don't remember	(0.985)	(0.937)		(0.748)		

Table 6: Logistic regression models of the probability of moving from Federico II University of Naples after bachelor's degree.

	Dependent variable:					
	Mover from University of Naples Federico II					
	(1)	(2)	(3)	(4)	(5)	(6)
Father's employment	0.743*	0.518		0.259		
Employed	(0.431)	(0.402)		(0.337)		
Mother's employment	0.817**	0.653**		0.383		
Employed	(0.326)	(0.294)		(0.244)		
Educational offer and organisation of course	−0.051	−0.194			−0.185	
	(0.259)	(0.192)			(0.220)	
Teaching quality	0.036				0.159	
	(0.222)				(0.186)	
Facilities	−0.137				−0.223	
	(0.190)				(0.155)	
Bachelor's degree quality	−0.117				−0.133	
	(0.119)				(0.092)	
Into socio-economic context	0.135				−0.008	
	(0.185)				(0.149)	
Cares about social changes	0.177				0.014	
	(0.189)				(0.156)	
Top university	−0.021				−0.109	
	(0.215)				(0.181)	
Top international university	−0.151	−0.203			−0.232*	
	(0.171)	(0.139)			(0.141)	
Developing ideas	−0.194				−0.062	
	(0.206)				(0.165)	
General university satisfaction	−0.119				0.007	
	(0.130)				(0.109)	
Would recommend my bachelor's degree ***More yes than no***	0.075	0.226			0.145	
	(0.360)	(0.329)			(0.300)	
Would recommend my bachelor's degree ***More no than yes***	1.800***	2.033***			1.461***	
	(0.552)	(0.498)			(0.443)	
Would recommend my bachelor's degree ***Definitely not***	0.671	1.421*			0.887	
	(0.932)	(0.766)			(0.747)	
Favourable post-graduate	−0.306***	−0.331***				−0.283***

Table 6: Logistic regression models of the probability of moving from Federico II University of Naples after bachelor's degree.

	Dependent variable:					
	Mover from University of Naples Federico II					
	(1)	(2)	(3)	(4)	(5)	(6)
	(0.086)	(0.079)				(0.058)
Observations	423	426	468	444	460	465
Log Likelihood	−182.157	−187.039	−281.704	−253.936	−238.572	−267.703
Akaike Inf. Crit.	424.313	412.078	567.408	527.872	505.145	539.407
Bayesian Inf. Crit.	545.7343	489.1121	575.7054	568.8303	562.9822	547.691

Note: *p<0.1; **p<0.05; ***p<0.01

Model (1) Complete model
Model (2) Selection of important variables from complete model
Model (3) Geographical aspects mode
Model (4) Parents' status mode
Model (5) University quality model
Model (6) Post-graduation model

Reference categories:
Gender (***Male***)
Abroad study periods (***No***)
Scientific area (***Socio-economic Sciences***)
Province (***Other province***)
Father's education (***Middle school***)
Mother's education (***Middle school***)
Father's employment (***Not employed***)
Mother's employment (***Not employed***)
Would recommend my bachelor's degree (***Definitely yes***)