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Birds of a Feather Flock Together. Evidence from a Study on the Networks of First-Year University Students

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Birds of a Feather Flock Together

Evidence from a Study on the Networks of First-Year University Students

Tiziano Gerosa, **Marco Romito**, **Gianluca Argentin** and **Teodora Erika Uberti**

ABSTRACT: *Research in higher education highlighted that students' dispositions toward social interaction with peers represent fundamental resources for their long-term academic success. These resources facilitate access to relevant knowledge and opportunities but are not equally distributed across the population. Non-traditional students coming from less advantaged social groups (e.g. working-class, racial minorities, first-in-family students) may lack familiarity with the university system and confidence in their academic ability compared to their middle-/upper-class peers, with negative consequences for the overall quality of their academic experience. In a country such Italy, where upper secondary school track allocations are highly conditioned by students' socioeconomic backgrounds, and where access to university has long been the prerogative of lyceum students, there is a lack of discussion on how previous school pathways relate to students' social networking once they enter university. In this study we present the first results of an ongoing research project aimed at exploring whether students' upper secondary school tracking is associated with their short-term ability to build social networks in a university context. The analyses are carried out on a sample of 267 bachelor's students in the field of social sciences, enrolled at a single university in northern Italy. Thanks to the collection of peer nominations and the adoption of sociometric techniques and network analysis, we found that students developed differentiated social connections among peers at the beginning of their academic experience depending on the type of upper secondary school they attended. Students from lyceums, in particular, started*

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their academic career with a relational advantage and developed new connections more frequently with peers coming from the same school track.

Introduction

In today's context of growing international competition, public discourse and institutional documents identify an increase in educational attainments as a crucial lever to enhance human capital and thus to achieve economic growth objectives. National and supra-national institutions promote policies to increase the proportion of graduates in the population, and fostering educational aspiration is a key element in the political agenda of many countries. At the same time, governments are adopting measures to evaluate and monitor student careers and the functioning of university institutions, in order to achieve 'efficient' objectives and reduce dropout and time to degree.

In recent decades university participation has increased remarkably at the global level. This growth has mainly involved middle-class students, but also a large proportion of students who would not usually enrol in academic studies due to their social origin and previous educational pathways (Schuetze and Slowey, 2002). Despite growing participation in the academic system, and despite the increasing heterogeneity of students' backgrounds, the experience of higher education is still primarily addressed at the singular, and does not adequately consider the increasing variety of previous educational pathways, cognitive, social and economic resources. In this regard, sociological research has shown persisting inequalities not only in students' enrolment at university, but also in their dropout risk, pathways through academia and post-tertiary educational choices. Higher education transition and higher education pathways are indeed multiple and the growing body of research on 'non-traditional' students[1]

[1] In the international literature, 'non-traditional students' is a broad category grouping together working-class, minority, first-generation, adult, and working students, or students with immigrant origins. In short, it includes those students who have been traditionally excluded from higher education and whose relationship with university is more complex and, on average, more difficult than the ones experiences by middle- or upper-class students (Bowl, 2001).

provides important insights through which to explore the processes at stake in the (re)production of inequalities within academic studies.

In particular, these studies are increasingly pointing to the crucial role played by the social and relational dimension of students' university experiences. It has been shown that troubled pathways and decisions to dropout are frequently associated with a lack of social integration with peers at university. Students at risk frequently show weak relational links, limited networks and the perception of being isolated and sometimes marginalized within the university context. This is an issue that has largely been overlooked by studies on higher education inequalities in Italy.

This paper draws on an ongoing research project carried out on first-year bachelor's students on a social sciences course at a university in the north of Italy. The project aims to investigate a wide set of individual and sociodemographic predictors of students' academic performance and how to better handle groupwork in classes. In this paper we focus only on one aspect of the larger research, namely students' relational integration in class at the beginning of the first academic year. The following analysis will estimate the influence of this characteristic along with several others on students' education pathways and academic careers.

Specifically, we investigate students' social networks in their classes through a questionnaire section based on peer nomination. Adopting statistical sociometric techniques and network analysis, we analyse the extent to which first-year students rely on and develop social connections with their peers at the beginning of their academic experience. More importantly, we explore whether there are differences in students' networks based on their upper secondary school track: the lyceum (academic), technical or vocational track. It is well known that, in Italy, upper secondary school tracking is a powerful mechanism of segregation among students from different social backgrounds and contributes to the reproduction of social inequalities in education (Romito, 2016). For this reason, we test whether segregation among students generated through tracking in upper secondary schools persists even with students' transition to university. We interpret these results using the concept of *institutional habitus* to acknowledge how the previous school tracks of first-year students contribute to shaping their capacities to develop social connections within the university context.

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The next section provides a brief literature review on the relationships between students' characteristics, their social networks and consequential education pathways. We then formulate our research hypotheses (section 2) and describe data and analytical strategies (sections 3 and 4). Hence, we share our findings about the structure and density of students' social networks and their linkage with previous school tracks (section 5). Finally, in the concluding section, we argue that such relational inequalities at the beginning of the first year of university may persist and even strengthen over time and briefly present future research paths exploring the consequences of the unequal distribution of social connections among university students.

1. Social networks, upper secondary school tracking and higher education pathways

The social dimension of university experience is attracting increasing attention in the international literature, notably among studies exploring issues related to inequalities and retention. Previous research had highlighted that university life is constituted by a complex articulation of various fields of social interaction and belonging (Galland, 1995). It has been emphasized that university massification has increased the number of ways through which students live their study experience (Dubet, 1994; Felouzis, 2001; Millet, 2001) and that students' connectedness with peers represents a key element in fostering feelings of affiliation and belonging to educational institutions (Coulon, 2005).

Holding almost paradigmatic status in the retention literature, Tinto's Social Integration Model constitutes a key theoretical contribution attempting to interpret the relationships between academic success and students' social connectedness with peers. Tinto's key hypothesis – which has been widely tested and reviewed (Cabrera *et al.*, 1993; Chrysikos *et al.*, 2017; Heublein, 2014; Pascarella and Terenzini, 1991; Yorke, 1999) – is that academic and social integration impacts on student commitment, and the more students are integrated, the more they successfully graduate.

Establishing meaningful social relationships in the academic context is particularly relevant for students lacking familiarity with the university system and confidence in their academic ability (Leathwood and O'Connell, 2003): the

ones previously labelled as 'non-traditional'. Studies conducted in Europe, the United States and Australia have shown how working-class, racial minority and first-in-family students frequently experience a lack of 'fitting' in a largely middle-class, white, social environment. Research has documented the feelings of social isolation experienced by non-traditional students and their consequences for educational careers.

Developing social networks allows students to access valuable information, guidance and emotional support in a new and difficult educational environment. University friends can provide study assistance, help interpret faculty instructions and may allow to answer academic requests in a climate of productive cooperation. Moreover, social relationships developed within the university context provide a sense of belonging to the institution, acquiring an important role in boosting student engagement and learning. In this respect, it has been shown that, despite having less social resources, a lower sense of belonging and less academic engagement compared to their middle-/upper-class peers, working-class students have a higher sense of belonging and academic engagement if they perceive themselves to be more socially connected.

Scholars in the field of education have long acknowledged the importance of peer networks for the analysis of students' academic achievements and class-based inequalities. Recent ethnographic studies are pointing out that university sociability and the creation of social networks are shaped by social class and ethno-racial identities. Peer networks structure the way students have access to relevant resources, knowledge and information and students' participation in specific university-based social niches shape the benefits they get from their university experience (in terms of academic results and post-university careers).

Overall, these studies provide important insights on the relevance of peer networks and relational integration to explain the production of inequalities through university pathways. However, one major gap can be identified in the literature. Although we know that social background is relevant in conditioning students' social connectedness, the factors influencing the development of peer networks at the beginning of the university experience have not been analysed in depth.

Scholars working within a Bourdieusian framework have developed the concept of *institutional habitus*, which is adopted in this paper to account for how previous schooling shapes students' ability to establish social connections

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at the start of their university experience. It has been remarked that, as with individual habitus, it is possible to identify distinctive habituses pertaining to specific educational institutions (or groups of similar institutions). Starting from a non-deterministic interpretation of the habitus, scholars have thus discussed how, with familial habitus, institutional habitus contributes to shaping students' attitudes, practical sense and capacity to move across social fields. A crucial concept here is *navigational capacities*, namely students' capacity to anticipate academic requests, their sense of membership in the university context and their ease or unease in creating social relationships in a new environment. This crucial set of attitudes and skills is conditioned not only by students' family backgrounds, but also by their previous schooling. It would be possible then to acknowledge whether the multiple ways through which students articulate their university experience (Dubet, 1994) is shaped not only by their social position, but also by their goals, projects and vocations. In this regard, there is need to account for how students' attendance to specific secondary schools' organizations or tracks contributes to structuring this set of attitudes towards academic experience.

This aspect seems particularly relevant for Italy, at least for two related reasons. First, in this country tracking within upper secondary school is crucial to processes of differentiation and reproduction of social inequalities. Native-born students belonging to the middle and upper social classes mainly obtain their graduation in lyceums, which prepare them for university in both humanistic and scientific disciplines and are considered the most prestigious types of upper secondary school. By contrast, technical and professional schools (vocational institutes) are primarily attended by students from less privileged socioeconomic backgrounds or of migrant origin (Gasperoni, 1996; Checchi, 2010; Panichella and Triventi, 2014; Gerosa and Romito, forthcoming). Second, the upper secondary school track followed by students plays a crucial role in conditioning their chances of enrolling at university and obtaining a tertiary degree. Recent studies show that having attended a technical or vocational school in Italy significantly reduces students' chances of enrolling at university, even after controlling for parental education (Ballarino and Panichella, 2016). Moreover, the risk of leaving university before obtaining a degree are significantly higher among students coming from these upper secondary school tracks (Contini *et al.*, 2017).

In this context, the strength of previous schooling in shaping students' dispositions and capacities to navigate the higher education environment assumes relevance. Our focus on the social relations of first-year students, which are largely overlooked in the Italian literature on students' university experiences and retention, leads us to ask to what extent previous tracking affects students' networks at the beginning of their academic career. Specifically, and considering the rigid Italian tracking system – in which access to university has long been a prerogative of lyceum students – we ask ourselves whether students coming from this track acquire any advantages in their social ties or in their ability to develop these ties at the beginning of their university experience.

2. Research hypotheses

In view of the crucial role played by social connectedness in shaping students' educational pathways and careers, the relevance of the Italian tracking system in upper secondary school and its link with the entry into tertiary education, in this study we aim to investigate whether upper secondary school tracking is associated with the relational resources of first-year students. In particular, we are interested in estimating whether upper secondary school tracking is associated with the developmental patterns and the strength of students' social networks at the beginning of their academic careers.

Keeping in mind insights from the research outlined above, we hypothesize that students' social networks are shaped by their previous upper secondary school track allocations. On the one hand, due to higher transition rates for students from lyceums (H1), we expect that these students begin their university experience with a higher number of already-established peer relationships compared to colleagues with technical and vocational secondary education who less frequently enrol in tertiary education. On the other hand, we expect that previous schooling paths are differently associated both with students' capacities to navigate university social life and with their sociability. In this respect, we hypothesize that (H2) being more at ease within the university context and having a higher sense of cultural proximity with higher education, students from lyceums more easily develop new contacts with their classmates in university courses.

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3. Data

The analyses are conducted on a sample of bachelor's degree students attending the first semester of courses in the field of social sciences at a university located in Milan, northern Italy. Compared to other fields of study, social sciences has the advantage of being attractive to a more heterogeneous group of students in terms of previous school experience. Data published by the Italian Ministry of Education[2] for the 2017-2018 academic year showed that, at the national level, social sciences courses were followed by students coming from a technical or a vocational school in 39% of cases. This percentage decreased to 33% for health sciences and 27% for the humanities, confirming that individuals coming from vocational and technically-oriented schools find more space in our reference field of study.

The data for this study were collected two weeks after the start of the 2019-2020 academic year and included only first-year students who had not previously attended other courses at the same university.

Participants were invited to fill a questionnaire though a PAPI (Paper And Pencil Interviewing) methodology, during class time and under the supervision of an external observer. Of the 315 students formally enrolled in the course 267 filled the questionnaire, with a final response rate of 85%.

The survey was designed to gather information on students' sociodemographic characteristics and previous school experience. Table 1 shows the samples' descriptive statistics for all variables included in the analyses. In line with our initial expectations, the distribution of participants by upper secondary school track shows that only a small proportion of them came from technical/vocational schools (17%)[3].

The part of the data collection relevant to this paper was focused on the reconstruction of the entire relational network of each student through a peer-nomination approach. This way of collecting data was first applied by educational scientists to a mapping of classroom sociograms (Groundlund, 1959). More recently it has been adapted for a wider scope of applications, such as the evaluation of school policies for bullying prevention, the identification of students at risk, and the analysis of student sociability for the improvement of

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[2] Results of the descriptive analysis conducted by the authors on the data of the national student registry. For more details visit http://anagrafe.miur.it/index.php.
[3] Due to this small number, we will consider students from technical and vocational schools together.

TAB. 1. *Descriptive statistics of the overall sample (N = 267): percentages (%), means (M), Standard Deviation (SD) and minimum and maximum values*

VARIABLES	N	%	M	SD	MIN	MAX
Gender						
Male	92	34.5				
Female	175	65.5				
missing	–	–				
Residence						
City of Milan	59	22.1				
Province of Milan	58	21.7				
Other provinces of the Region	116	43.5				
Other Regions	33	12.4				
missing	*1*	*0.4*				
Parents ethnic origins						
Native	228	85.4				
Migrant (at list 1 parent)	39	14.1				
missing	–	–				
Parents education in years			12.4	3.1	5	21
missing	*1*	*0.4*				
Secondary school track						
Lyceum	222	83.2				
Technical & vocational	45	16.9				
missing	–	–				
N of given nominations			2.7	2.1	0	9
missing	–	–				
N of given nominations (pre university)			2.2	2.0	0	9
missing	–	–				
N of received nominated			2.6	2.0	0	11
missing	–	–				
N of received nominated (pre university)			0.5	0.8	0	3
missing	–	–				
N of received nominated (post university)			2.1	2.0	0	11
missing	–	–				

classroom climate and cooperation (Badalay *et al.*, 2013; Lansu and Cillessen, 2012). With the use of new statistical techniques for the analysis of relationships in various settings and at different degrees of complexity, peer nominations have now become a valid alternative to traditional survey methods for the study of social networks at multiple levels of analysis (Cillessen and Marks, 2017). In our study, we simply asked each participant to list those peers they were already acquainted with in the class at the time of the interview, encouraging them to distinguish between those they had met during the course and those they already knew before the beginning of their academic experience (Tab. 1).

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Previous research in this field has generally relied on a limited number of nominations, usually between three and five (Newcomb and Bukowski, 1983). This is particularly true for analyses of difficult and uncommon behaviours such as social withdrawal or victimization (Parkhurst and Asher, 1992). Due to the large size of our reference sample and the general nature of our request to participants, which was simply to indicate all the students in the class they know and spend time with, we decided to provide first-year students the opportunity to mention up to 12 students (Tab. 1). On average, interviewed students named 2.7 students in the class, ranging from none to nine. To measure students' social connectedness using this peer nominations data, we computed five indexes starting from each student ego-network: (*a*) the total number of alters mentioned by each student, and among these (*b*) how many were already existing before university enrolment; (*c*) total number of nominations received by each student, and of these (*d*) how many were links already existing before university enrolment and (*e*) how many were established in the first weeks of university enrolment.

In Table 1 we present also the descriptive statistics for all the control variables considered in our statistical analyses. Looking at gender, 66% of students were female, in line with the enrolment trends registered over the last decade in Italian universities for social science courses (Noé, 2012). About family background, we observed that one student out of seven had at least one parent born in another country than Italy, while distribution by household place of residence indicates that only 22% of participants were from the city in which the university is located. Finally, family educational level – measured as the number of years spent in education by the parent with the highest qualification (dominance criterion), and with a potential values ranging from 0 to 13 – shows that, on average, students came from families in which at least one parent had obtained a high school diploma.

4. Methods

In order to investigate the association between upper secondary school track and students' social connectedness at the individual level, we estimated three series of sociometric models based bivariate and multivariate OLS (Ordinary

Least Squares) regressions. In the first stage of analysis, we estimated the association between students' upper secondary school track (lyceum vs technical/vocational) and all their given and received nominations at the time of the interview, both bivariate and controlling also for the entire set of covariates described in the previous paragraph (gender, parental education, migration background, family residence). In the second stage of our analysis, we re-estimated the same models, focusing only on the connections made by students before the beginning of their academic experience. Finally, we estimated the difference between students from lyceums and technical/professional schools in the number of new relations established with classmates, namely those that were initiated after the start of the academic experience.

We also investigated students' relations at group level, looking at the networks emerging from peer nomination data. This is the domain of Social Network Analysis (SNA), a powerful statistical technique to describe networks of relations in educational contexts and to visualize them (Scott and Carrington, 2011; Wasserman and Faust, 1994). Using this analytical framework, we exploited our peer nomination data to map first-year students' relations and analyse their structural heterogeneity within the class, visualizing isolated subjects, small cohesive subgroups (triads and dyads) and bigger subgroups. In addition, we estimated network indexes that synthesize the broader features of these links and the driving forces enabling students to establish relations. According to our analytical approach, we first mapped the entire network of the class based on students' nominations. Secondly, we focused only on the relationships already established by students with classmates before the beginning of their academic experience. In addition, in order to evaluate the relevance of upper secondary school tracks in shaping students' networks, we identified participants according to their previous lyceum or technical/vocational schooling experience. We also computed the E-I indexes of homophily of students' networks along this characteristic.

The analyses were conducted with two different statistical software: data preparation and OLS regression models at individual level were carried out with STATA 15, while network analyses were conducted with PAJEK64 5.07.

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5. Results

In this section, we present the main results of our analyses. First, we look at the number of contacts that each student has with peers, testing whether there are differences between first-year students coming from lyceums or from technical/vocational schools (H1). Second, we explore the shape and distribution of students' networks within the class, again looking at the differences among those coming from different school tracks (H1). In both cases, we also compare social relations existing at the time of our data collection with students' pre-existing knowledge which was already active before enrolment at university (H2).

5.1. *Contacts among students*

To investigate the number of contacts existing among students in the class, we rely both on the nominations made by each subject and on those he/she received. Table 2 shows data about students' contacts in the class, comparing those coming from a lyceum with those coming from a technical/vocational school. On average, students named between two and three peers whom they knew in the class at the time of the interview. Similar results emerged for the number of nominations received by students, with an overall average of 2.6. Nonetheless, it must be noticed that more than one first-year student out of 10 did not know any colleague two weeks after the beginning of the courses. Comparing students by their upper secondary school track, we observe that those coming from vocational/technical schools – a minority in the class – display a lower mean number of contacts. The same result emerges for both the number of given and received nominations, suggesting a high degree of reciprocity in the naming process. Both differences do not change in size and are statistically significant (respectively, p-values 0.040 and 0.018) also in an OLS regression model, comparing students from the two school tracks and controlling for compositional characteristics of the two subsamples (gender, parental education, migratory background, family residence)[4].

[4] Here and in the following regression models, we took seriously the issue of extreme values potentially biasing our conclusions, based on a small sample. We always run sensitivity analyses, recoding the extreme values in the distributions, and the result presented in the article were always consisting across models.

TAB. 2. *Students' contacts in the class at the time of the interview, by upper secondary school track*

	NUMBER OF STUDENTS NAMED BY THE SUBJECT			NUMBER OF STUDENTS NAMING THE SUBJECT		
	Lyceum	Technical or Vocational	Total	Lyceum	Technical or Vocational	Total
Distribution %						
None	14.0	22.2	15.4	13.1	17.8	13.9
1	16.7	22.2	17.6	15.3	26.7	17.2
2 or 3	35.1	26.7	33.7	40.1	35.5	39.3
4 or more	34.2	28.9	33.3	31.5	20.0	29.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mean	2.82	2.16	2.70	2.77	2.02	2.64
Standard deviation	2.10	1.80	2.06	2.00	1.59	1.95
Median	3	2	2	3	2	3
Number of cases	222	45	267	222	45	267

Focusing not only on the average number of contacts, but also on the distribution of this variable, we see that differences between students coming from lyceums and technical/vocational schools are widespread along all possible relational situations. Students from technical/vocational schools are less included in larger networks (four or more contacts), are more frequently alone in class and are, at most, in contact only with a single student.

As stated above, we also asked students to tell us whether they knew named subjects before enrolling at the university, allowing us to identify the stock of contacts maintained by each first-year student at the start of his/her academic career (Tab. 3). In this case, we observe that the average number of contacts is much lower: two thirds of first-year students entered the class without knowing anybody there. This condition of isolation describes 84.4% of students coming from technical/vocational schools. In addition, while 10% of students coming from lyceums knew at least one other person, none among those coming from technical/vocational schools knew another person[5].

One may wonder to what extent the fact that students coming from lyceums already knew people in the class led to having a larger number of contacts at

[5] This difference does not vary and is statistically significant in a OLS regression model controlling for the entire list of covariates described above; p-value 0.01.

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TAB. 3. *Students' pre-existing contacts in the class, by upper secondary school track*

	NUMBER OF STUDENTS NAMED BY THE SUBJECT			NUMBER OF STUDENTS NAMING THE SUBJECT		
	Lyceum	Technical or Vocational	Total	Lyceum	Technical or Vocational	Total
Distribution %						
None	62.1	84.4	65.9	63.1	84.4	66.7
1	22.1	15.6	21.0	23.9	15.6	22.5
2 or 3	10.8	0.0	9.0	13.0	0.0	10.8
4 or more	5.0	0.0	4.1	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mean	0.59	0.16	0.52	0.55	0.16	0.48
Standard deviation	0.89	0.37	0.84	0.84	0.37	0.80
Median	0	0	0	0	0	0
Number of cases	222	45	267	222	45	267

the moment of the interview, as illustrated in Table 1. In order to answer this question, we developed further statistical analysis on our data. We modelled the number of new contacts developed by students. As a reliable measure of effectively established new relations, we considered for each subject the number of nominations received by peers claiming that they did not know the named student before enrolling at university. Results from these regression models are graphically displayed in Figure 1.

Overall, we see that – after controlling for composition characteristics – students coming from lyceums are named more frequently by students who did not previously know them, meaning that they established new relations. The comparison with students from technical/vocational schools shows a positive difference equal to 0.44, though not statistically significant (p-value 0.18). This difference rises to 0.61 and becomes statistically significant (p-value 0.06) once controlling for the number of pre-existing relations in the class. Overall this advantage may be the consequence of two mechanisms: (*a*) students from lyceums develop new contacts more easily in the class, thanks to the ones they already had there; or (*b*) students from lyceums develop new contacts with peers more easily even though they are not relying on their pre-existing contacts in the class. To test the relevance of both mechanisms, we compared once again the number of new relations for students coming from lyceums or from technical/

FIG. 1. *Difference between students from lyceums and students from technical/vocational schools in the mean number of new relations established in the class, by presence of pre-university relations with classmates (n = 267, coefficients from regression models)*
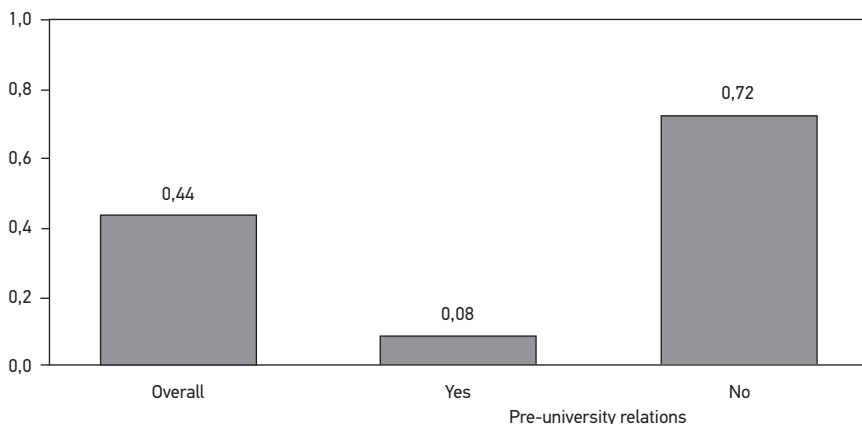
vocational schools, this time splitting both samples in two groups: students with pre-existing relations and those not relying on previous contacts in the class[6]. From Figure 1 it is clear that the advantage for students coming from lyceums in establishing new contacts is entirely due to the fact that the ones not relying on pre-existing contacts in the class developed new relations more easily.

Despite being limited to a small sample of students in a specific field of study and a single academic context, our results suggest that students coming from a lyceum are doubly advantaged in the development of academic networks. They more frequently undertake a bachelor course of study already knowing some of their classmates and, even when this is not the case, they more easily establish new contacts with unknown peers.

5.2. *Structures and homophily of students' networks*

The analysis in the previous section considered ego's relations (sent and/or received). In this section, we focus on the overall network structure to verify if our results can be reinforced. More precisely, we evaluate whether networks of students in the class show homophily based on their school track.

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[6] We considered here both nominating and being nominated by someone they already knew.

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FIG. 2. *Networks of relations in the class, by upper secondary school track (n = 267), black = lyceum, white = vocational*
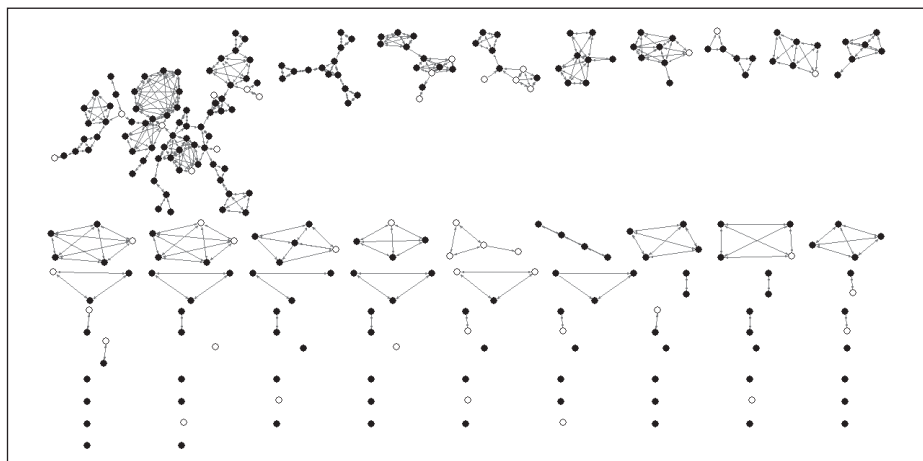
The first network structure includes peer nominations, in which each student listed all those peers she/he was already acquainted with in the class. The network is very sparse, as showed by the density index (out of all potential links, only 2% are actually at place). It is also quite fragmented (14% of total students are isolated), except for a main component defined by the 28% of the overall sample of students. No hubs emerge: students' community is at the early stages and no pivotal nodes concentrate relations. Focusing on link formation, we computed the E-I index according to students' upper secondary school track. E-I index ranges between –1 (all links are internal to the groups) to +1 (all links are external to the groups). In this network, E-I index is negative and equal to –0.595, hence there are homophilic patterns of link creation inside the same groups, proving that students from lyceums tend to aggregate with peers coming from the same track and that the same applies to students from technical/vocational schools.

Focusing on the network of students claiming to have met his/her classmates before university enrolment (Fig. 3), we detect a sparser (with a density equal to 0.002) and extremely fragmented network (62% of total students are isolated), with the largest subgroup including only 4% of the overall sample. Former acquaintances in the class are not common and the social resources coming from previous contacts are quite rare, as also seen above (Tab. 3). Nevertheless,

FIG. 3. *Networks of previous knowledge in the class, by upper secondary school track (n = 267), black = lyceum, white = vocational*
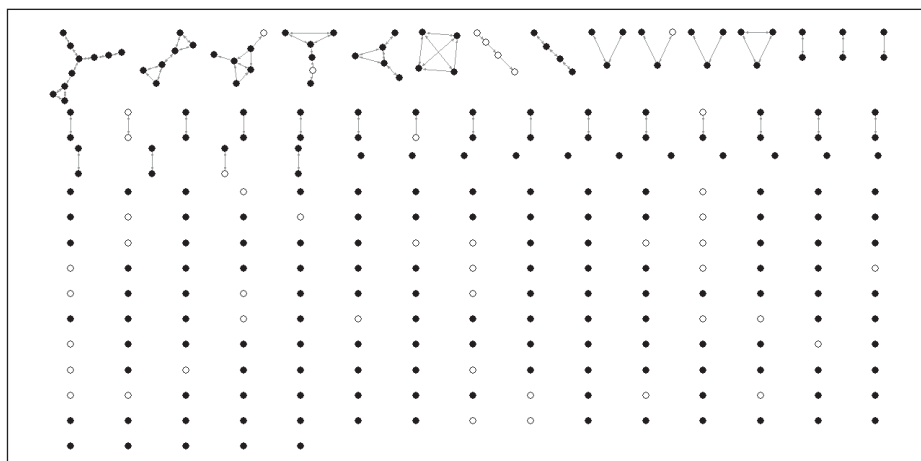
it is interesting to observe that this network is also extremely homophilic, with a highly negative E-I index (–0.851). In other words, first-year students at the beginning of their university experience, when in contact with classmates, tend to establish relations with individuals from the same type of school.

Overall, an investigation of both networks reinforces the results from the earlier analyses on the number of nominations. Students from lyceums start their academic career with a relational advantage due to homophilic pre-existing networks. Moreover, during the formation of the academic community in the class, they more frequently develop new connections with peers coming from the same school track.

Discussion

Recent research in higher education highlights that students' social dispositions and attitudes, such as their sense of belonging to university and their abilities in creating new bonds and friendships with peers, represent fundamental resources for long-term academic success.

These resources facilitate meeting new people and accessing relevant knowledge and opportunities, but they are not equally distributed among students.

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International research has shown how patterns of creation of social connections among peers within the university environment are significantly conditioned by students' ascribed memberships. It has been shown how students' participation in socially homophilic relational niches enforces the production of inequalities through their university journey. In particular, students coming from social contexts and educational pathways that do not fit the traditional recruitment pool basin for higher education institutions experience feelings of social isolation and lack of 'fit' with their peers.

In the Italian context, due partly to a lack of data available on this topic, the sociological literature has largely overlooked the patterns of social connections among university students and the ways in which they might enforce inequalities. Moreover, in a country such as Italy, where upper secondary school track allocations are highly conditioned by students' social backgrounds, and where access to university has long been a prerogative of lyceum students, there is a lack of discussion on how previous school pathways and social ties are associated with students' social networks once at university.

To fill these research gaps, the present study investigated whether and how upper secondary school tracking is associated with students' relational networks within the university context at the start of their tertiary studies.

Two main hypotheses were identified and empirically tested. First, we expected that students from lyceums would start their university experience with a relational advantage as they would have more frequently enrolled in courses also attended by classmates from their previous schools. Second, we expected that being more at ease within the university context and having a higher sense of cultural proximity with higher education, students from lyceums would more easily develop contacts with new classmates.

Results of the analyses confirmed, to some extent, our initial hypotheses, although in a rather unexpected way. Due to the higher transition rates displayed by lyceum students, we expected that their advantage in creating social connections would have been mainly explained by social ties that already existed before entering university (i.e. previous classmates or schoolmates). On the contrary, our data show that the large majority of students participating in our survey, even when coming from lyceums, did not have any previous contacts with their peers. The advantage for students coming from lyceums in establishing new contacts was largely due to the fact that they developed new relationships more

rapidly and easily than their technical/vocational counterparts. This is clearly confirmed by our network analysis, which showing patterns of link creations with a significant degree of social closure. Hence, students from lyceums started their academic journey with a relational advantage due to pre-existing homophilic networks, but when establishing new relationships they did so in ways that again reproduced the same patterns. The results suggest that students' segregation occurring due to tracking tends to be persistent and reproduces at the start of university studies. Previous upper secondary school tracking might play a major role in the articulation and differentiation of the relational life of first-year students.

In line with the already-mentioned patterns of social segregation characterizing Italian upper secondary school tracks, our results may be interpreted by referring to class-based cultural affinities in structuring social interaction. However, the same results hold, even when controlling for variables related to students' social and cultural background. This suggests that upper secondary school tracking imprints a specific direction onto students' dispositions and capacities to navigate the social environment in higher education. In this respect the concept of institutional habitus, elaborated by a particularly prolific strain of qualitative research, might constitute an interesting heuristic to account for how, along with family upbringing and background social contexts, the organization of schools plays a specific role in the shaping of students' social dispositions. Based on this research strain, our results might suggest that students' sense of 'fit' among peers, and their feeling more or less at ease in experimenting with social interactions within the university context, are structured not only by their social origins but also by their previous trajectories through educational organizations.

Before concluding we must also account for some limitations. These are primarily related to the pilot and local nature of our research project. We had the opportunity to work only on data from a single course within a specific university. A study on social science students has the advantage that members of this group are characterized by greater heterogeneity in their previous upper secondary school experience compared to others, but our focus on a single course of study did not allow us to investigate how contextual variables such as course organization or classroom composition affect students' sociability and networking strategies. Further research in this field should then address the issue of ex-

ternal validity, including collection of peer nomination data from students from different courses, or at least from those courses in which the distribution of upper secondary school track is strongly unbalanced. These could, for example, be health and medicine courses, where access is regulated by specific selection criteria based on students' previous performances and testing.

Another useful addition might be to collect longitudinal data on student networks, in order to understand whether what we detected is a temporary homophily or the first step in social closure processes leading to differentiation in their academic performances.

Overall, our results, though limited, reinforce the idea that students' social relations should be widely explored by sociological research interested in investigating academic dropout and inequalities within universities. Most importantly, we believe that this analytical focus can provide relevant insights for the investigation of institutional practices. The ways adopted by university institutions to structure university life are crucial in fabricating unequal pathways among students. Also students' sociality is shaped by institutional practices (or lack of them) and could actively contribute to the enhancement of academic differentiation among students (Galland, 1995; Romainville, 2002). As Coulon (2005) points out, there is a need to develop a 'pedagogy of affiliation' to foster the cognitive and practical skills needed to prosper in higher education, particularly among students from underprivileged backgrounds, and especially at the beginning of their academic careers.

Finally, we want to underline the need for additional research on social relations among first-year students in Italian academia. The research we have presented here is part of a larger project aimed at ascertaining if and how the introduction of groupwork in the first years of study actively contributes in changings the patterns of students' sociability and academic achievement. In our opinion, designing and assessing interventions targeted at first-year students seems a promising way to improve results coming from research in order to formulate policy recommendations aimed at improving students' wellbeing and performance and at promoting equal opportunities among students from different social and educational backgrounds.

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