



Job-major match and job satisfaction in Italy

Journal:	<i>International Journal of Manpower</i>
Manuscript ID:	IJM-03-2014-0083.R1
Manuscript Type:	Research Paper
Keywords:	Graduates, Job-major match, Job Satisfaction, Parental background, Structural equation modeling

SCHOLARONE™
Manuscripts

Review

1. Introduction

Individuals matriculate in and graduate from university studies in order to improve their abilities in the labour market. Their jobs after graduation may or may not fit their expectations, but in principle that job should conform to their attended study programme.

The extent to which graduates acquire qualifications that exceed those required to perform their job is called *overeducation* (Büchel and Pollmann-Schult, 2004). The published literature shows a wide focus on the relevance of overeducation among graduates (Allen and Van der Velden, 2001; Battu *et al.*, 1999; Caroleo and Pastore, 2013; Chevalier and Lindley, 2009; Green and Zhu, 2010; Robert, 2014; Wolniak and Pascarella, 2005). Results from the Reflex project, a large-scale European survey among higher education graduates, show that over 25% of European graduates report their competences as not fully exploited, and this percentage is even higher (30%) in Italy (Allen and Van der Velden, 2007).

Overeducation may have important effects on several employment outcomes. On the one hand, overeducated workers are more likely to take home low earnings (Battu *et al.*, 1999; Caroleo and Pastore, 2013), or the return in earnings of surplus education is lower than the return to the required education (Dolton and Vignoles, 2000). On the other hand, overeducation strongly negatively affects job satisfaction (Allen and Van der Velden, 2001, 2007; Green and Zhu, 2010). As a consequence of both effects, workers are more likely to change jobs (Maynard *et al.*, 2006).

From the entrepreneurial point of view, lower job satisfaction results in lower individual productivity (Verhaest and Omey, 2009). Moreover, workers satisfied with their job have a significantly decreased absenteeism (Farrell and Stamm, 1988), work late (Koslowsky *et al.*, 1997), and improper behaviour at work (Dalal, 2005).

Job satisfaction is a complex and multifaceted concept that depends on earnings but also other factors. In several European countries, the type of work is the main determinant of job satisfaction, not earnings (Skalli *et al.*, 2008; Sousa-Poza and Sousa-Poza, 2000), and this is true with regard to recent graduates in Italy (Bocuzzo and Gianecchini, 2014).

Job satisfaction also depends on individual expectations so that people with a higher level of education show lower levels of job satisfaction as a consequence of higher expectations from their job (Ganzach, 2003; Poggi, 2010).

To fully understand and analyse the overeducation issue and its relationship with job satisfaction, researchers have to take into account that any academic degree is the result

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

of a sequential process starting just after the end of compulsory education. According to the country-specific characteristics of the educational system, any individual career comprises first the choice of a high school (and its successful completion), then the choice of a University faculty. However, any educational decision is necessarily affected by the cultural and socio-economic context in which the student lives (Flint, 1992; Hearn, 1984). This means that parental and socio-economic backgrounds play an important role in determining educational and employment outcomes during the individual's life. The extent to which individuals move (up or down) the social ladder relative to one's parents is known as intergenerational social mobility. In a relatively immobile society, individual outcomes, such as education, occupation, or income, tend to be strongly related to those of their parents (Corak, 2004). On the one hand, in less mobile societies human skills may be wasted or misallocated. On the other hand, motivations, effort, and individual productivity may be affected by the lack of equal economic opportunities. These in turn may affect the overall efficiency and growth potential of a country. An interesting discussion on the different channels through which educational attainments of future generations may be affected by educational choices of previous generations is provided by Checchi (2006).

The influence of parental socio-economic status on the descendants' education, incomes, and occupation has been widely investigated (Dustmann, 2004; Solon, 1999). Thus, mothers and fathers play a different role in shaping the educational achievements of their children (Dustmann, 2004; Ermisch and Francesconi, 2001). Mediterranean countries show low intergenerational social mobility, and this phenomenon is particularly noticeable in Italy (Checchi, 2006). However, in Italy, the educational background of parents does not directly affect the probability of being overeducated but indirectly affects this probability through the choice of the type of high school (Caroleo and Pastore, 2012). Moreover, risk of overeducation is mainly determined by the type of school diploma and to a less extent, the high school diploma grade (Büchel and Pollmann-Schult, 2004).

Several studies have analysed the relationships between overeducation and the level and type of degree. Having a second-level degree does have a positive effect on attaining a job in which the acquired knowledge and skills are fully utilised (Allen and De Weert, 2007; Caroleo and Pastore, 2013), whereas discordant results appear with respect to the disciplinary area of the degree (Cutillo and Di Pietro, 2006; Wolniak and Pascarella, 2005).

Caroleo and Pastore (2013) showed that Italian graduates from Law, Medicine, and technical disciplines are less likely to experience overeducation. These authors also

provide an interesting interpretation of the educational mismatch in Italy: overeducation is the result of the inefficiencies of the tertiary educational and training system and particularly of the difficulties in enhancing job-related competences. This interpretation is consistent with recent theories of educational mismatch that trace it back to the low supply of human capital rather than to an excess of it; despite the growing level of youth education, job competences continue to be insufficient (Leuven and Oosterbeek, 2011). There is a potential demand for skills in the production system which remains unexploited because of the youth experience gap and their educational mismatch. With this perspective, overeducation could be a result of wrong abilities provided by universities.

In the following, we analyse data gathered from a sample of University of Padua graduates. Data refer to graduates' perceived match between the competencies implied by their job and those achieved at university. Our data were collected during the three years after graduation, which is a sufficient amount of time for the majority of graduates to settle down professionally. Our analyses respond to the following research questions:

- (i) Is there an observed mismatch between education characteristics and job profiles in the sample of Italian graduates?
- (ii) Does major job consistence affect the level of job satisfaction?
- (iii) Do consistence and satisfaction depend on graduates' characteristics?

The remainder of the paper is organised as follows: Section 2 describes the research and provides some information on the Italian educational system, while Section 3 describes the theoretical background and the methodology adopted in this manuscript. Section 4 reports the results of the analysis, and Section 5 draws some conclusions and policy implications.

2. Italian context, data and model

2.1 *The Italian educational system*

The Italian educational and training system has been characterised by several reforms during the last century (see Garrouste [2010] for a comprehensive overview of the entire educational reform process in Italy). However, the system that describes the educational career of the cohort of graduates involved in this analysis can be summarised as follows:

- a) A primary (compulsory) education, divided in two cycles lasting 8 years in total. Primary education usually begins at age 6.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
- b) An upper secondary (high) school, comprising a generalist (classical, scientific, linguistic, artistic) gymnasium (in Italian *liceo*) and a professional (*istituto tecnico*) and a vocational (*istituto professionale*) training system. High schools usually consist of 5 years of schooling.
 - c) The university system, divided into two cycles: the bachelor's degree is awarded at completion of the first cycle, which lasts 3 years; the entrance age to this level is typically 19-years old. The master's degree is awarded at completion of the second cycle, which lasts 2 years; to continue to the master's degree, a bachelor's degree is required.
 - d) Post-graduate education.

22 2.2 The survey

23 Data analysed in this study come from a longitudinal survey (called *Agorà*) that
24 investigated the professional outcomes of 2007 and 2008 graduates (Fabbris, 2012)
25 from the University of Padua, one of the most important universities in Italy. The
26 graduate number is usually larger than 10,000; specifically, there were 12,167 graduates
27 in 2007 and 11,757 in 2008.
28

29 A representative sample of graduates of all faculties except Medicine was
30 interviewed 6, 12, and 36 months after graduation, using a computer-assisted telephone
31 interview technique (CATI). Graduates were asked to provide a wide range of
32 information about their current jobs (e.g. duties and tasks, working hours, salary,
33 characteristics of the firm), the search activities they performed to obtain their jobs, any
34 skill or educational mismatches, and a general assessment of their academic and
35 professional careers. The survey also collected information about the respondents'
36 demographic and educational backgrounds and work experience.
37

38 A question on global job satisfaction is present in the survey: '*On a 1 to 10 scale,*
39 *how satisfied are you with your job?*'. The satisfaction levels for several specific job
40 aspects were also measured.
41

42 The following questions were posed to specifically collect the feelings of graduates
43 about their job-education consistency:
44

- 45
- a) Necessity of degree: 'For serving your current job, (i) the university degree you hold is specifically required; (ii) a graduate from any major could obtain similar results; (iii) a university degree is not necessary, a high school degree could suffice; (iv) a qualification lower than high school could suffice.'
 - b) Skill exploitation: 'To what degree can you exploit your professional skills at work? (i) Not at all; (ii) Not much; (iii) Quite; and (iv) Very much.'
- 46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
- c) Adequacy of professional background: ‘All in all, on a 1 to 10 scale, how adequate for your job is the professional background you achieved at university?’
 - d) Coherence with studies: ‘All in all, on a 1 to 10 scale, to what degree does your job cohere with the education you achieved at university?’
 - e) Forma mentis: ‘To what degree can you exploit at work the ‘forma mentis’, that is the comprehensive discipline knowledge deriving from education in a specific major? (i) Not at all; (ii) Not much; (iii) Quite; and (iv) Very much.’

19
20
21
22
23
24
25

The response rate was 94.3% 6 months after graduation, 91.4% after 12 months, and 83% after 36 months (Table 1); 2,436 graduates answered the survey and were employed 36 months after graduation. To our purposes, we refer only to the employed graduates at their first job or at a different job if they already worked during their studies. In total, the analysed sample size was $n = 2,046$.

26
27

[Table 1 here]

28
29
30
31
32
33
34
35
36
37

The final sample was mainly composed by women (57.4%). The study programmes in Engineering and in Humanities were the most represented faculties (17.6% and 17.2%, respectively). The third most- represented faculty in terms of graduates was Science (12.8%), and the remaining faculties each accounted for about 5-7% of graduates; people from the Law (3.3%) and Veterinary (2.6%) programmes represented the smallest proportions of graduates.

38 39

2.3. Structural equation modelling

40
41
42
43
44
45

Structural Equation Modelling (SEM) is the statistical approach we adopted for data analysis. It is a general technique aimed at evaluating the consistency of the collected data with a substantive theory. It is particularly useful for studying the relationships among latent constructs, to be specified a priori and usually measured through a multiplicity of indicators (Bollen, 1989).

46
47

A general SEM is specified as:

$$\begin{aligned}
 \eta &= B \eta + \Gamma \zeta + \varsigma \\
 y &= A_y \eta + \varepsilon \\
 x &= A_x \zeta + \delta,
 \end{aligned}
 \tag{1}$$

48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9 where η is the vector of latent endogenous variables, ζ is the vector of latent exogenous variables, and y and x are vectors of observed variables; B (where the elements in the main diagonal are set to 0) and Γ are the matrices of parameters to be estimated in the 'structural equation', and A_y and A_x are the matrices of factor loadings in the 'measurement equations' of model (1); ζ is the vector of errors in the structural equation, and ε and δ are the vectors of errors in the measurement equations.

10
11
12
13
14
15
16
17
18
19
20
21
22
23 Such a model allows the separation of the total effect of a causal variable into direct and indirect effects in order to better understand the mechanism through which that variable affects the outcomes. *Direct* is the effect of a variable not mediated in the model by any other variables, *indirect* is its effect mediated by other variables, and *total* is the overall causal relationship between that variable and other (latent or manifest) variables.

24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000

The usual approach to estimate model parameters in SEM is the maximum likelihood (ML) solution even though other estimation procedures can be adopted. Among them, the Full Information Maximum Likelihood (FIML) algorithm, performed using SAS software (SAS Institute Inc., 2011), was used to estimate our final model. We opt for an FIML solution because the information on parents' level of education was not collected for students who graduated in 2007. FIML is a model-based method for estimating parameters in the presence of missing data. Strictly speaking, it is not an imputation method since it does not impute missing values into newly created data sets but provides parameter estimates derived from the available data as well as implied values of the missing data (Arbuckle, 1996). This estimation procedure provides roughly unbiased estimates, particularly with small sample sizes.

The traditional measure for evaluating the overall model fit in SEM is provided by chi-square statistics. Since severe shortcomings are associated with its use (Kline, 2005), a variety of alternative goodness-of-fit indices have been proposed. There is still disagreement among researchers about the application of these alternative statistics, but a good practice is to report a variety of indices (Boomsma, 2000): one should always be the Standardized Root Mean Square Residual (SRMR; Hu and Bentler, 1999); another could be the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI) or the Goodness of Fit index (GFI).

The SRMR is a measure of the mean absolute correlation residual; it computes the overall difference between the observed and the predicted correlations. Its main advantage is the lack of any distributional assumption of the outcome variables. SRMR ranges from 0 to 1, where 0 means a perfect model fit. According to Hu and Bentler (1999), SRMR values lower or equal to 0.08 can be considered acceptable.

1
2
3
4
5
6
7
8
9 RMSEA is a popular fit statistic because of its sensitivity to the number of estimated
10 parameters in the model. This index basically follows a non-central chi-square
11 distribution; a value of 0 indicates the *best fit* even though this does not necessarily
12 mean the *perfect fit*. Most SEM researchers agree on a cut-off value close to 0.06 (Hu
13 and Bentler, 1999) or 0.07 (Steiger, 2007). Moreover, a confidence interval around the
14 value can be specified; in a well-fitting model the lower bound of the 90% confidence
15 interval should be close to 0, while the upper bound should be lower than 0.10 (Browne
16 and Cudeck, 1993).

17
18 In SEM applications, some fit indices (i.e. GFI) are undefined under the FIML
19 procedure even though several other popular fit statistics can still be computed (Enders,
20 2001).
21

22 23 24 2.4. *The analytic model*

25 To measure the educational outcomes that are the focus of our analyses, two latent
26 variables were defined through confirmatory factor analysis: job-major match and job
27 satisfaction. The indicators to measure job-major match are necessity of the achieved
28 degree (its standardized factor score [*sfs*] equals 0.589), coherence with studies (*sfs* =
29 0.811), *forma mentis* (0.560), and adequacy of professional background (0.586). Job
30 satisfaction is measured by overall job satisfaction (0.751), satisfaction for
31 professionalism (0.710), satisfaction for cultural interests (0.807) and skill exploitation
32 (0.563). Job-major match and job satisfaction are then affected by individual and social
33 characteristics of graduates, as well as their educational paths. .
34

35
36 The theoretical model behind our analysis is based on the literature reviewed in the
37 Introduction and follows a logical and temporal structure that is summarised in Figure
38 1.
39

40 Social capital is set at the beginning of the individual educational pathway. The
41 parental level of education (both father and mother) and their professional activities are
42 assumed as measures of social capital as a latent variable. Since Italy shows a low
43 intergenerational social mobility, we might expect a positive relationship between
44 parental socio-economic status and high school choice (gymnasium versus all other
45 types of schools) as well as social capital and final high school grade. Therefore, gender
46 and social capital are assumed to affect high school choices, while gender, social
47 capital, and high school type are the main determinants of the final high school grade.
48 Since gymnasium is an academic-oriented high school type in Italy, its educational
49 standards are expected to be higher than those of the other high schools; as a result, the
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

gymnasium final grade is expected to be lower than the grade obtained by students who attended a professional or training system.

The next step of the educational path is the faculty choice, which is assumed to depend on gender, social capital, high school type, and final high school grade; the same variables, together with the attended university course of study, affect in turn the final degree grade. As a consequence of the low intergenerational social mobility trait that characterises Italy, a higher the social capital results in students most likely attending elitist and historical faculties (such as Law, Medicine, Humanities), whilst these students are less likely to choose other less traditional university schools.

Although we might expect that a higher high school grade will result in a higher university grade, because of the university-oriented training provided by the gymnasium, a positive relationship between gymnasium attendance and university degree grade is also expected.

For graduates who found a job, the job-major match may depend on gender, high school and its final grade, major and level (bachelor or master) of the attended university programme, and degree final grade. As highlighted in the Introduction, social capital is assumed to affect the job-major match only indirectly.

We therefore hypothesise that job satisfaction may be affected by the same variables defined as explanatory variables investigating the consistency between job and major plus the latent variable 'job-major match' itself. We also assume a direct effect of social capital on job satisfaction. Social capital may be a measure of the networking capabilities of a graduate and his or her family by leveraging social relations, which are generally supposed to be richer and more extensive for parents with higher education and better occupations, graduates are more likely to find more satisfactory jobs.

The model is identified according to the recursive rule with no correlated errors in the endogenous variables (Bollen, 1989). The notation and specification of the SEM model are shown in Appendix 1.

[Figure 1 here]

3. Results

3.1. Job-education match

According to 44.2% of graduates, the degrees they hold are necessary for performing their current job, whilst 38.1% of graduates believe that any university degree could suffice for their activity (Table 2).

A high variability among disciplines characterises these data; necessity of the awarded degree ranges from 30.5% for graduates in the humanities area [1] to 57.2% for workers in technical or scientific areas. The interval is even higher if faculties (not shown) are considered. At one extreme, only 12.7% of graduates in Political Science and 18.6% in Humanities stated that the gained degree was necessary; at the other extreme, 94.0% of graduates in Law and 69.3% in Pharmacy stated that the degree they had was required for their jobs. A remarkable one out of every four graduates in the Humanities area declared that a high school degree would have sufficed for their current job.

The slight disadvantage of female graduates with respect to males in job-education consistency is mainly attributable to the higher percentage of women graduating with concentrations in the Humanities. The analysis stratified by faculty (not shown) often reveals no clear pattern of mismatch between male and female graduates. Sometimes women seem advantaged over men with regard to consistency (study programmes in Pharmacy or Education), in other cases (in particular, Agriculture and Economics), men possess this advantage.

Job-education mismatch is higher for graduates who achieved a bachelor's degree; only 30.2% of them gained a job where the achieved degree was necessary, while 28.5% could be considered over-educated. Conversely, more than half of those with master's degrees held a degree appropriate for the job they were in, and only one out of ten accepted a job for which the possession of a high school degree would have sufficed.

Graduates with better high school and academic performance seem to have jobs that match their educational levels. Final grades for both high school and university were significantly higher ($p < 0.0001$) for people who found a job that matched their higher studies.

Given the large heterogeneity in grading practice among the faculties (the lowest average grade was 96.3 for Statistics and the highest was 108.3 for Psychology), the final university grade is in better agreement with the level of job-major consistency

1
2
3
4
5
6
7
8
9 when the analysis is stratified by faculty (not shown). Graduates in Economics showed
10 a mean grade of 91.3 if a high school diploma was sufficient for their job and a mean of
11 100.7 if their degree was strictly necessary for their chosen work. Similar results can be
12 observed for Pharmacy (mean values were 90.0 and 100.2, respectively), Humanities
13 (101.0 and 106.4), Engineering (97.3 and 103.2), Statistics (90.7 and 98.8), and
14 Political Science (95.0 and 103.8).

15
16 From Table 2 it is also worth noting that graduates having the right degree for the
17 job, or having a job that required a university degree, feel more satisfied with their jobs.
18 Work positions matching the major of the achieved degree involve higher incomes and,
19 for more than 40% of graduates, job guarantee.

20
21 Parents' education is weakly related to job-education consistency. For jobs that
22 require specific university titles, a clear tendency exists for parents to be more educated,
23 whilst job mismatches are associated mainly with lower parental educational status. It
24 can be hypothesized that, when choosing a university course, highly educated parents
25 are able to direct descendants towards a proper discipline and, after their graduation,
26 activate their own social networks to help their descendants get better jobs.
27
28

29 [Table 2 here]
30

31
32 The necessity of a certain degree at work is highly correlated with coherence between
33 completed studies: the Goodman and Kruskal co-graduation index $\gamma = 0.671$ is large
34 and significant (95% confidence interval: 0.639-0.702). It is less correlated with
35 indicators of the skills' use: the co-graduation with adequacy of professional
36 background is $\gamma = 0.467$ (0.423-0.511) and with skill exploitation is $\gamma = 0.463$ (0.405-
37 0.520). Indeed, skill exploitation could depend on other aspects in addition to job-
38 education match, such as the organisational structure, the number and role of
39 colleagues, the type and level of tasks (the higher the level and the more diversified the
40 tasks, the more restrained the use of strictly technical skills and the wider that of cross-
41 occupational skills for managing and solving problems).
42

43
44 University studies are generally relevant for work; 24.8% of graduates very
45 frequently use and another 60.6% quite frequently use the skills acquired at university
46 (Table 3).

47
48 The use of superior skills is highly associated with job satisfaction. On a ten-point
49 scale, satisfaction ranged from 5.5 of 10 if skills are not used to 8.1 if they are
50 repeatedly used. From Tables 2 and 3 we can deduce that 'over-educated' graduates are
51 less satisfied with their jobs, in concordance with the current literature.
52
53
54
55
56
57
58
59
60

[Table 3 here]

3.2. Pathways from social and educational capital to job satisfaction

We now investigate the pathways from graduates' social capital to job satisfaction, moving through high school and university performance. Results are reported in Tables 4 to 10.

The null hypothesis of the chi-square test for evaluating the model fit is rejected. However, model residuals are far from normality. Thus, the SRMR index, which is equal to 0.06, seems to be more apt to evaluate the model's goodness of fit; it has a lower value than the cut-off reported by Hu and Bentler (1999). In addition, the RMSEA statistic is 0.099, a value somewhat larger than the cut-off suggested by Steiger (2007). However, the upper bound of the 90% confidence interval for RMSEA is equal to 0.101, a value just beyond the upper bound proposed by Browne and Cudeck (1993). Therefore, taking into account the complexity of the estimated model, its fit to the data seems good.

Our analysis begins with family social capital. In this paper, the parental socio-economic background is evaluated by means of the parents' education and employment activity (Table 4). *Ceteris paribus*, parents' education contributes to descendants' social capital to a greater degree than does parents' occupational status. The role played by fathers is stronger compared to the mothers' contribution. Regardless of the indicators, children acquire stronger social capital according to the strength of the position or condition of their parents (Table 4).

[Table 4 here]

Any higher educational career starts with the choice of the type of high school to attend (Table 5). As expected, family social capital is crucial in choosing high school type; individuals living in better off and better-educated contexts are significantly inclined to choose a gymnasium ($p < 0.010$). A significant positive direct effect ($p = 0.013$) may be observed for young females.

[Table 5 here]

The final high school grade is negatively correlated ($p < 0.010$) with gymnasium attendance (Table 6). This is likely, because in general, educational standards and

1
2
3
4
5
6
7
8
9 learning diligence required by the gymnasium are higher than those by other high
10 schools. So, the direct effect of social capital on the final grade is no longer significant.
11 Social capital affects the high school grade through the attended school type ($p < 0.010$)
12 and it is negative because of lower grades achieved by students at gymnasium. Other
13 things being equal, women get better marks at the end of high school than men
14 ($p < 0.010$).
15

16
17 [Table 6 here]
18

19
20 The next step in a high school graduate's career is the choice of the study programme
21 and the university to attend (Table 7). The high school final grade plays a significant
22 ($p < 0.010$) role in the study programme choice—positive for Economics, Engineering,
23 and Law, negative for the remaining faculties but the Humanities and Statistics (for
24 which it is neutral).
25

26 Moreover, having attended a gymnasium affects directly and positively the choice
27 of a study programme at the faculties of Engineering, Law, Pharmacy and Sciences
28 ($p < 0.010$) and negatively the choice of enrolment in all other faculties but Humanities,
29 Psychology and Statistics. Indirect effects are often in the opposite direction than direct
30 ones (because the indirect effect passes through the high school final grade, which is
31 lower for gymnasium).
32

33 Women are inclined to choose programmes in Education, Pharmacy, Psychology, or
34 Humanities (the total effects are significant, $p < 0.010$). This is a new demonstration
35 that, in comparison to men, young women tend to choose liberal arts and health
36 programmes in larger numbers (the faculty of Medicine did not contribute to the survey,
37 but two-thirds of its students are women).
38

39 The role of social capital on the choice of the study programme is noteworthy; the
40 more substantial the social capital, the larger the tendency to choose Engineering or
41 Law programmes. The opposite applies to the Education and Agriculture programmes,
42 which means that the higher the parents' status the less likely students are to enrol in
43 these faculties after graduating from high school.
44

45
46 [Table 7 here]
47

48 A further step in one's higher educational career is graduation (Table 8). Other
49 factors being equal, the final grade of women is higher than that of men (analogously to
50 high school). Social capital still shows important effects that are stronger ($p < 0.010$)
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9 when indirect and weaker ($p=0.043$) when direct. The sum of these two effects is
10 positive and significant with stronger family social capital resulting in a higher final
11 university grade ($p<0.010$). Both variables representing high school attendance (type of
12 school and final grade) mutually agree; a positive and significant direct effect is
13 opposed to a negative and significant indirect effect. Merging the two effects, we obtain
14 a positive and significant overall effect of the basic high school descriptors on marks at
15 graduation.
16

17 Apart from Pharmacy (which is not statistically different with respect to Veterinary
18 Medicine), faculties show significant direct effects on the final mark; students in
19 Economics or Statistics get the lowest grades at graduation, whilst the highest are in
20 Education, Humanities and Psychology. Hence, in interpreting the effectiveness of the
21 study programme on graduates' external outcomes, it will be necessary to mentally
22 stratify the final marks by faculty.
23
24

25 [Table 8 here]
26
27
28

29 The last stage of our analysis is to investigate if and how the human (that is, the
30 merge of social and educational) capital accumulated by these graduates affects job
31 quality as measured by job-major match and job satisfaction.
32

33 We sketched in Figure 1 that social capital indirectly affects the gap between major
34 and skills used by graduates at work, but according to the estimated model, this
35 relationship is not significant (Table 9). The high school final grade shows as a good
36 predictor of a student's ability rather than the graduation final grade; both the direct and
37 the indirect effects of the high school grade on job-major consistency are significant
38 ($p<0.010$), whilst the effects of the final grade are not. This is not a surprise as evidence
39 exists of a wide heterogeneity across faculties as well as homogeneity within faculties
40 in terms of the final grade. As anticipated in Section 3.1, large proportions of students
41 in liberal arts, or in education or psychology programmes attain top grades, whilst in
42 other programmes (in particular, in economics or statistics) the average grades are low.
43
44

45 The gymnasium attendance together with the high school final mark remains a
46 good predictor of a graduate's use of major-specific skills. To support this view, Table
47 9 shows that the effects of gymnasium attendance and those of the attended faculty
48 work in different directions with respect to job-major consistency; the effects of the
49 former attendance are positive and indirect ($p=0.044$) and no direct effects are
50 significant, whilst the indirect effects of the attended faculty are not. Other aspects
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9 being the same, the attendance of a programme in Agriculture, Political Science,
10 Humanities, or Psychology has a negative direct effect on the consistency between
11 university major and the achieved skills use, while a positive effect applies for
12 programmes in the faculties of Economics, Pharmacy, Education, Law, and
13 Engineering.
14

15
16 [Table 9 here]
17

18 Hence, the choice of the faculty is the crucial step in one's educational pathway because
19 it may affect in a positive or a negative manner the education that graduates can use to
20 their advantage in the labour market. The match between education and work activity is
21 also lower with lower degree levels (bachelor versus master degree).
22

23 As expected, if job skills match the university major, even job satisfaction will be
24 high ($p < 0.01$; Table 10). The relationship between expectations from and satisfaction
25 with a job can explain why the direct effect of the bachelor's degree on job satisfaction
26 is positive and significant ($p < 0.010$), signalling that graduates with bachelor's degrees
27 are more satisfied with their job than those with master's degrees. This inverse of what
28 is expected is likely due to the lower expectations of lower titled graduates.
29

30 On the other hand, if mediated by job-major matching, the job satisfaction of a
31 bachelor graduate is lower than that of a master graduate. Bachelors are less satisfied
32 because of lower job-major matching (indirect effect) but more satisfied because of
33 lower expectations (direct effect). The merge of the direct and indirect effects results in
34 a lack of total effects of the degree level on job satisfaction. This finding can be
35 considered a valuable example of the advantages provided by our approach in
36 disentangling direct from indirect effects.
37

38 In relation to job satisfaction, the university final grade is not significant, whilst the
39 high school final grade still presents a positive and significant indirect effect ($p < 0.010$).
40 No faculty shows a negative and significant direct relationship with job satisfaction.
41 Only programmes in Agriculture, Education, Political Sciences, Psychology, and
42 Humanities show significant direct effects and other than programmes in Education, all
43 of these also have a negative indirect effect. In order to understand such results, it is to
44 be noted that the labour expectations of graduates from the liberal arts or social
45 programmes are low, and often these graduates might feel that just finding a job was
46 amazing, regardless of the low consistency between their job activities and their past
47 studies. After controlling for the different stages of the educational career, social capital
48 vanishes as a covariate of job satisfaction.
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Even if women perform better than men with respect to both school and university outcomes, their job-major consistency is lower than that of males, both directly ($p=0.026$) and indirectly ($p=0.017$). This may mean that jobs gained by women are less qualified than those of equally educated men. Women are also less satisfied than men with their jobs ($p=0.019$), *ceteris paribus*.

[Table 10 here]

4. Conclusions and discussion

A major conclusion of our analyses is that the proportion of graduates from Padua University with more skills than required by their job is lower than the percentages usually detected in Italy and Europe. Padua is located in northeastern Italy, a geographical region whose economic system, unlike that of the rest of Italy, is affected by the presence of 'local production systems'. These areas are characterised by high concentrations of small and medium-sized firms in manufacturing and service activities, high levels of innovation, and a strong relationship with universities and research centres.

There is evidence that graduates' occupational destiny is strongly affected by the choice of the type of high school and university study programme. The reason is strictly social. For any individual, there is a common thread from family social status to high school and performance, from high school's distinctive features to a higher educational programme and performance, and from that on to work. Our results clearly show that in Italy the type of high school is a crucial step in the individual educational pathway and might shape the future professional career. The counselling and orientation activities provided by both teachers and the family environment assume a key role in the educational career of each youth. These activities have to be carried out at early stages of any educational path, probably earlier than expected. The choice of the high school is likely driven by parents, relatives, and sometimes youths' friends. This means that social capital strongly determines one's outcomes until the end of high school. Policies should be devoted to enhance both the mentoring support of the 'educators', according to the skills, abilities, and expectations of their students, and the conscious parental involvement in their children's high school choices. This finding strongly supports other conclusions for the Italian case. Checchi (2000) argued that 'the educational career is significantly predetermined by the choice of the secondary school undertaken at the age of 14, mainly by the family'; Checchi and Jappelli (2004) claimed that 'since parents make decisions on the basis of their perception of school quality, it would be important

1
2
3
4
5
6
7
8
9 to improve parents' information about school characteristics and students' performance
10 in later schooling'.

11 Regarding university studying, it is evident that the match between education and
12 work activity is lower with the lowest degree level, and this could signal a failure of the
13 bachelor programme in Italy. Bachelor studies are supposed to have a more
14 occupational-oriented character than the master ones; hence, bachelor graduates should
15 be more likely to find a job qualified as matched. It is likely that the current
16 characteristics of the Italian bachelor degree do not achieve the purposes behind this
17 branch of university reform. Policy should be devoted to fill in the current gap in order
18 to really improve training provided by this low degree level.

19 Our mismatch rate ranged between 17.7% (overt irrelevance of the university title)
20 and 55.8% (included 38.1% of cases for which any university degree would be equally
21 valid). We are tempted to state that overeducation is an inappropriate term and, as
22 claimed by Caroleo and Pastore (2013), there is a skill mismatch due to 'wrong'
23 abilities. In effect, skills mismatch and low job satisfaction are greater for majors of a
24 nontechnical nature (Political Science, Humanities, and Psychology). Thus, the
25 university major is pivotal in determining the graduates' perception of being over- or
26 undereducated and of being satisfied with the job they are in. The different degrees are
27 relevant signals of the skills held by graduates, possibly affecting an individual's
28 chance of finding a qualified job.

29 We conclude that it would be beneficial for a higher educational institution to both
30 appraise which jobs are the 'graduate jobs' (the job market share for graduates) and to
31 inform students of this appraisal at any stage of their lives—before they choose a higher
32 educational programme, when they are in it, and at its end. On the other hand, students
33 should and can change such a rather deterministic social chain between social capital,
34 high school choice and results, higher educational choices and final grade, and
35 occupation. A student might be able to design his/her own investments in higher
36 education and long-term labour strategies. This calls for strategic counselling at the
37 very early stages of choosing a path through higher education. This type of counselling,
38 which should involve a forecast of the occupational opportunities in a plausible future,
39 is likely to enhance students' positive attitudes towards choosing a university path that
40 is labour-oriented, even if this purpose may be weakened if labour markets are poor.

41 42 43 44 45 46 47 48 **Notes**

49 [1] Disciplinary areas are: Humanities (Humanities Psychology, Education), Social Science
50 (Economics, law, Political Science, Statistics), Life Sciences (Veterinary Medicine,
51 Pharmacy, Agriculture), Technical and Scientific (Engineering, Science).
52
53
54
55
56
57
58
59
60

References

- Allen, J. and Van der Velden, R. (2001), "Educational mismatches versus skill mismatches: Effects on wages, job satisfaction and on-the-job search", *Oxford Economic Papers*, Vol. 53, pp. 434-52.
- Allen, J. and Van der Velden, R. (2007), "The Flexible Professional in the Knowledge Society: General Results of the REFLEX Project", Research Centre for Education and the Labour Market Maastricht University, The Netherlands.
- Allen, J. and de Weert, E. (2007), "What do educational mismatches tell us about skill mismatches? A cross-country analysis", *European Journal of Education*, Vol. 42, pp. 59-73.
- Arbuckle, J.L. (1996), "Full information estimation in the presence of incomplete data", in Marcoulides, G.A. and Schumacker, R.E. (Eds.) *Advanced Structural Equation Modeling*, Lawrence Erlbaum Associates Inc., Mahwah, NJ, pp. 243-77.
- Battu, H., Belfield, C.R., and Sloane, P.J. (1999), "How well can we measure graduate over-education and its effects?", *National Institute Economic Review*, Vol. 171, pp. 82-93.
- Boccuzzo, G. and Gianecchini M.(2014), "Measuring Young Graduates' Job Quality through a Composite Indicator", *Social Indicator Research*, DOI: 10.1007/s11205-014-0695-6.
- Bollen K. (1989), *Structural Equations with Latent Variables*, Wiley, New York.
- Boomsma, A. (2000), "Reporting analyses of covariance structures", *Structural Equation Modeling*, Vol. 7, pp. 461-83.
- Browne, M.W. and Cudeck, R. (1993), "Alternative ways of assessing model fit", in Bollen, K.A. and Long, J.S. (Eds.) *Testing Structural Equation Models*, Sage, Newbury Park, CA, pp. 136-62.
- Büchel, F. and Pollmann-Schult, M. (2004), "Overeducation and human capital endowments", *International Journal of Manpower*, Vol. 25, pp. 150-66.
- Caroleo, F.E. and Pastore, F. (2012), "Talking about the Pigou Paradox. Socio-Educational Background and Educational Outcomes of AlmaLaurea", *International Journal of Manpower*, Vol. 33, pp. 27-50.
- Caroleo, F.E. and Pastore, F. (2013), "Overeducation at a Glance: Determinants and Wage Effects of the Educational Mismatch, Looking at the AlmaLaurea Data", IZA Discussion Paper No. 7788, Germany.
- Cecchi, D. (2000), "University education in Italy", *International Journal of Manpower*, Vol. 21, pp. 177 – 205.
- Cecchi, D. (2006), *The Economics of Education: Human Capital, Family Background and Inequality*, Cambridge University Press, Cambridge.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
- Checchi, D. and Jappelli, T. (2004), "School Choice and Quality", CEPR Discussion Papers 4748, C.E.P.R. Discussion Papers.
- Chevalier, A. and Lindley, J. (2009), "Over-education and the skills of UK graduates", *Journal of the Royal Statistical Society, Series A*, Vol. 172, pp. 307-37.
- Corak, M. (2004), *Generational Income Mobility in North America and Europe*, Cambridge University Press, Cambridge.
- Cuttillo, A. and Di Pietro, G. (2006), "The effects of overeducation on wages in Italy: A bivariate selectivity approach", *International Journal of Manpower*, Vol. 27, pp. 143-68.
- Dalal, R.S. (2005), "A meta-analysis of the relationship between organizational citizenship behavior and counterproductive work behavior", *Journal of Applied Psychology*, Vol. 90, pp. 1241-55.
- Dolton, P. and Vignoles, A. (2000), "The incidence and effects of overeducation in the U.K. graduate labour market", *Economics of Education Review*, Vol. 19, pp. 179–198.
- Dustmann, C. (2004), "Parental background, secondary school track choice, and wages", *Oxford Economic Papers*, Vol. 56, pp. 209–230.
- Enders, C.K. (2001), "A Primer on Maximum Likelihood Algorithms Available for Use With Missing Data", *Structural Equation Modeling*, Vol. 8, pp. 128-41.
- Ermisch, J. and Francesconi, M. (2001), "Family matters: impacts of family background on educational attainments", *Economica*, Vol. 68, pp. 137–156.
- Fabbris, L. (2012), "Preface: Graduates as informants of higher education effectiveness", in Fabbris, L. (Ed.), *Indicators of Higher Education Effectiveness*, McGraw-Hill Education, Milan, pp. V-XI.
- Farrell, D. and Stamm, C.L. (1988), "Meta-analysis of the correlates of employee absence", *Human Relations*, Vol. 41, pp. 211–27.
- Flint, T.A. (1992), "Parental and planning influences on the formation of student college choice sets", *Research in Higher Education*, Vol. 33, pp. 689-708.
- Ganzach, Y. (2003), "Intelligence, education and facets of job satisfaction", *Work and Occupations*, Vol. 30, pp. 97-122.
- Garrouste, C. (2010), "100 Years of Educational Reforms in Europe: A contextual database" Luxembourg: Publications Office of the European Union, EUR 24487 EN.
- Green, F. and Zhu, Y. (2010), "Overqualification, job dissatisfaction, and increasing dispersion in the returns to graduate education", *Oxford Economic Papers*, Vol. 62, 740-63.
- Hearn, J.C. (1984), "The relative roles of academic, ascribed, and socioeconomic characteristics in college destinations", *Sociology of Education*, Vol. 57, pp. 22-30.
- Hu, L.T. and Bentler, P.M. (1999), "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives", *Structural Equation Modeling*, Vol. 6, pp. 1-55.

- 1
2
3
4
5
6
7
8
9 Kline, R.B. (2005), *Principles and Practice of Structural Equation Modeling* (2nd ed.),
10 The Guilford Press, New York.
- 11 Koslowsky, M., Sagie, A., Krausz, M. and Singe, A.D. (1997), "Correlates of employee
12 lateness: Some theoretical considerations", *Journal of Applied Psychology*, Vol. 82,
13 pp. 79–88.
- 14 Leuven, E. and Oosterbeek, H. (2011), "Overeducation and Mismatch in the Labor
15 Market". IZA Discussion Paper No. 5523. Available at SSRN:
16 <http://ssrn.com/abstract=1771245>.
- 17 Maynard, D. C., Joseph, T. A. and Maynard, A. M. (2006), "Underemployment, job
18 attitudes, and turnover intentions." *Journal of Organizational Behavior*, Vol. 27, pp.
19 509-36.
- 20 Poggi, A. (2010), "Job satisfaction, working conditions and aspirations", *Journal of*
21 *Economic Psychology*, Vol. 31, pp. 936-49.
- 22 Robert, P. (2014), "Job mismatch in early career of graduates under post-communism",
23 *International Journal of Manpower*, Vol. 35, pp. 500-13.
- 24 SAS Institute Inc. (2011), *SAS/STAT 9.3 User's Guide*, SAS Institute Inc., Cary, NC.
- 25 Skalli, A., Theodossiou, I. and Vasileiou, E. (2008), "Jobs as Lancaster goods: Facets
26 of job satisfaction and overall job satisfaction", *Journal of Socio-Economics*, Vol.
27 37, pp. 1906-20.
- 28 Solon, G. (1999), "Intergenerational Mobility in the Labor Market," in Ashenfelter,
29 O.C. and Card, D. (Eds), *Handbook of labor economics*, Vol. 3, Part A, North-
30 Holland, Amsterdam, pp. 1761-1800.
- 31 Sousa-Poza, A. and Sousa-Poza, A.A. (2000), "Well-Being at Work: A Cross-National
32 Analysis of the Levels and Determinants of Job Satisfaction", *Journal of Socio-*
33 *Economics*, Vol. 29, pp. 517-38.
- 34 Steiger, J.H. (2007), "Understanding the limitations of global fit assessment in
35 structural equation modelling", *Personality and Individual Differences* Vol. 42, pp.
36 893-98.
- 37 Verhaest, D. and Omeij, E. (2009), "Objective overeducation and worker well-being: A
38 shadow price approach", *Journal of Economic Psychology*, Vol. 30, pp. 469-481.
- 39 Wolniak, G.C. and Pascarella, E.T. (2005), "The effects of college major and job field
40 congruence on job satisfaction", *Journal of Vocational Behavior*, Vol. 67, pp. 233–
41 51.
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1. Introduction

Individuals matriculate in and graduate from university studies in order to improve their abilities in the labour market. Their jobs after graduation may or may not fit their expectations, but in principle that job should conform to their attended study programme.

The extent to which graduates acquire qualifications that exceed those required to perform their job is called *overeducation* (Büchel and Pollmann-Schult, 2004). The published literature shows a wide focus on the relevance of overeducation among graduates (Allen and Van der Velden, 2001; Battu *et al.*, 1999; Caroleo and Pastore, 2013; Chevalier and Lindley, 2009; Green and Zhu, 2010; Robert, 2014; Wolniak and Pascarella, 2005). Results from the Reflex project, a large-scale European survey among higher education graduates, show that over 25% of European graduates report their competences as not fully exploited, and this percentage is even higher (30%) in Italy (Allen and Van der Velden, 2007).

Overeducation may have important effects on several employment outcomes. On the one hand, overeducated workers are more likely to take home low earnings (Battu *et al.*, 1999; Caroleo and Pastore, 2013), or the return in earnings of surplus education is lower than the return to the required education (Dolton and Vignoles, 2000). On the other hand, overeducation strongly negatively affects job satisfaction (Allen and Van der Velden, 2001, 2007; Green and Zhu, 2010). As a consequence of both effects, workers are more likely to change jobs (Maynard *et al.*, 2006).

From the entrepreneurial point of view, lower job satisfaction results in lower individual productivity (Verhaest and Omey, 2009). Moreover, workers satisfied with their job have a significantly decreased absenteeism (Farrell and Stamm, 1988), work late (Koslowsky *et al.*, 1997), and improper behaviour at work (Dalal, 2005).

Job satisfaction is a complex and multifaceted concept that depends on earnings but also other factors. In several European countries, the type of work is the main determinant of job satisfaction, not earnings (Skalli *et al.*, 2008; Sousa-Poza and Sousa-Poza, 2000), and this is true with regard to recent graduates in Italy (Bocuzzo and Gianecchini, 2014).

Job satisfaction also depends on individual expectations so that people with a higher level of education show lower levels of job satisfaction as a consequence of higher expectations from their job (Ganzach, 2003; Poggi, 2010).

To fully understand and analyse the overeducation issue and its relationship with job satisfaction, researchers have to take into account that any academic degree is the result

of a sequential process starting just after the end of compulsory education. According to the country-specific characteristics of the educational system, any individual career comprises first the choice of a high school (and its successful completion), then the choice of a University faculty. However, any educational decision is necessarily affected by the cultural and socio-economic context in which the student lives (Flint, 1992; Hearn, 1984). This means that parental and socio-economic backgrounds play an important role in determining educational and employment outcomes during the individual's life. The extent to which individuals move (up or down) the social ladder relative to one's parents is known as intergenerational social mobility. In a relatively immobile society, individual outcomes, such as education, occupation, or income, tend to be strongly related to those of their parents (Corak, 2004). On the one hand, in less mobile societies human skills may be wasted or misallocated. On the other hand, motivations, effort, and individual productivity may be affected by the lack of equal economic opportunities. These in turn may affect the overall efficiency and growth potential of a country. An interesting discussion on the different channels through which educational attainments of future generations may be affected by educational choices of previous generations is provided by Checchi (2006).

The influence of parental socio-economic status on the descendants' education, incomes, and occupation has been widely investigated (Dustmann, 2004; Solon, 1999). Thus, mothers and fathers play a different role in shaping the educational achievements of their children (Dustmann, 2004; Ermisch and Francesconi, 2001). Mediterranean countries show low intergenerational social mobility, and this phenomenon is particularly noticeable in Italy (Checchi, 2006). However, in Italy, the educational background of parents does not directly affect the probability of being overeducated but indirectly affects this probability through the choice of the type of high school (Caroleo and Pastore, 2012). Moreover, risk of overeducation is mainly determined by the type of school diploma and to a less extent, the high school diploma grade (Büchel and Pollmann-Schult, 2004).

Several studies have analysed the relationships between overeducation and the level and type of degree. Having a second-level degree does have a positive effect on attaining a job in which the acquired knowledge and skills are fully utilised (Allen and De Weert, 2007; Caroleo and Pastore, 2013), whereas discordant results appear with respect to the disciplinary area of the degree (Cutillo and Di Pietro, 2006; Wolniak and Pascarella, 2005).

Caroleo and Pastore (2013) showed that Italian graduates from Law, Medicine, and technical disciplines are less likely to experience overeducation. These authors also

provide an interesting interpretation of the educational mismatch in Italy: overeducation is the result of the inefficiencies of the tertiary educational and training system and particularly of the difficulties in enhancing job-related competences. This interpretation is consistent with recent theories of educational mismatch that trace it back to the low supply of human capital rather than to an excess of it; despite the growing level of youth education, job competences continue to be insufficient (Leuven and Oosterbeek, 2011). There is a potential demand for skills in the production system which remains unexploited because of the youth experience gap and their educational mismatch. With this perspective, overeducation could be a result of wrong abilities provided by universities.

In the following, we analyse data gathered from a sample of University of Padua graduates. Data refer to graduates' perceived match between the competencies implied by their job and those achieved at university. Our data were collected during the three years after graduation, which is a sufficient amount of time for the majority of graduates to settle down professionally. Our analyses respond to the following research questions:

- (i) Is there an observed mismatch between education characteristics and job profiles in the sample of Italian graduates?
- (ii) Does major job consistence affect the level of job satisfaction?
- (iii) Do consistence and satisfaction depend on graduates' characteristics?

The remainder of the paper is organised as follows: Section 2 describes the research and provides some information on the Italian educational system, while Section 3 describes the theoretical background and the methodology adopted in this manuscript. Section 4 reports the results of the analysis, and Section 5 draws some conclusions and policy implications.

2. Italian context, data and model

2.1 The Italian educational system

The Italian educational and training system has been characterised by several reforms during the last century (see Garrouste [2010] for a comprehensive overview of the entire educational reform process in Italy). However, the system that describes the educational career of the cohort of graduates involved in this analysis can be summarised as follows:

- a) A primary (compulsory) education, divided in two cycles lasting 8 years in total. Primary education usually begins at age 6.

- b) An upper secondary (high) school, comprising a generalist (classical, scientific, linguistic, artistic) gymnasium (in Italian *liceo*) and a professional (*istituto tecnico*) and a vocational (*istituto professionale*) training system. High schools usually consist of 5 years of schooling.
- c) The university system, divided into two cycles: the bachelor's degree is awarded at completion of the first cycle, which lasts 3 years; the entrance age to this level is typically 19-years old. The master's degree is awarded at completion of the second cycle, which lasts 2 years; to continue to the master's degree, a bachelor's degree is required.
- d) Post-graduate education.

2.2 The survey

Data analysed in this study come from a longitudinal survey (called *Agorà*) that investigated the professional outcomes of 2007 and 2008 graduates (Fabbris, 2012) from the University of Padua, one of the most important universities in Italy. The graduate number is usually larger than 10,000; specifically, there were 12,167 graduates in 2007 and 11,757 in 2008.

A representative sample of graduates of all faculties except Medicine was interviewed 6, 12, and 36 months after graduation, using a computer-assisted telephone interview technique (CATI). Graduates were asked to provide a wide range of information about their current jobs (e.g. duties and tasks, working hours, salary, characteristics of the firm), the search activities they performed to obtain their jobs, any skill or educational mismatches, and a general assessment of their academic and professional careers. The survey also collected information about the respondents' demographic and educational backgrounds and work experience.

A question on global job satisfaction is present in the survey: 'On a 1 to 10 scale, how satisfied are you with your job?'. The satisfaction levels for several specific job aspects were also measured.

The following questions were posed to specifically collect the feelings of graduates about their job-education consistency:

- a) Necessity of degree: 'For serving your current job, (i) the university degree you hold is specifically required; (ii) a graduate from any major could obtain similar results; (iii) a university degree is not necessary, a high school degree could suffice; (iv) a qualification lower than high school could suffice.'
- b) Skill exploitation: 'To what degree can you exploit your professional skills at work? (i) Not at all; (ii) Not much; (iii) Quite; and (iv) Very much.'

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

5

- c) Adequacy of professional background: 'All in all, on a 1 to 10 scale, how adequate for your job is the professional background you achieved at university?'
- d) Coherence with studies: 'All in all, on a 1 to 10 scale, to what degree does your job cohere with the education you achieved at university?'
- e) Forma mentis: 'To what degree can you exploit at work the 'forma mentis', that is the comprehensive discipline knowledge deriving from education in a specific major? (i) Not at all; (ii) Not much; (iii) Quite; and (iv) Very much.'

The response rate was 94.3% 6 months after graduation, 91.4% after 12 months, and 83% after 36 months (Table 1); 2,436 graduates answered the survey and were employed 36 months after graduation. To our purposes, we refer only to the employed graduates at their first job or at a different job if they already worked during their studies. In total, the analysed sample size was $n = 2,046$.

[Table 1 here]

The final sample was mainly composed by women (57.4%). The study programmes in Engineering and in Humanities are-were the most represented faculties (17.6% and 17.2%, respectively). The third most-represented faculty in terms of graduates is-was Science (12.8%), and the remaining faculties each accounted for about 5-7% of graduates; people from the Law (3.3%) and Veterinary (2.6%) programmes represented the smallest proportions of graduates.

2.23. Structural equation modelling

Structural Equation Modelling (SEM) is the statistical approach we adopted for data analysis. It is a general technique aimed at evaluating the consistency of the collected data with a substantive theory. It is particularly useful for studying the relationships among latent constructs, to be specified a priori and, usually measured through a multiplicity of indicators (Bollen, 1989).

A general SEM is specified as:

$$\begin{aligned} \eta &= B \eta + \Gamma \zeta + \varsigma \\ y &= A_y \eta + \varepsilon \\ x &= A_x \zeta + \delta, \end{aligned} \quad (1)$$

where η is the vector of latent endogenous variables, ζ is the vector of latent exogenous variables, and y and x are vectors of observed variables; B (where the elements in the main diagonal are set to 0) and Γ are the matrices of parameters to be estimated in the so-called 'structural equation', and A_y and A_x are the matrices of factor loadings in the 'measurement equations' of model (1); ζ is the vector of errors in the structural equation, and ε and δ are the vectors of errors in the measurement equations.

Such a model allows the separation of the total effect of a causal variable into direct and indirect effects in order to better understand the mechanism through which that variable affects the outcomes. *direct-Direct* is the effect of a variable not mediated in the model by any other variables, *indirect* is its effect mediated by other variables, and *total* is the overall causal relationship between that variable and other (latent or manifest) variables.

The usual approach to estimate model parameters in SEM is the maximum likelihood (ML) solution, even though other estimation procedures can be adopted. Among them, the Full Information Maximum Likelihood (FIML) algorithm, performed using SAS software (SAS Institute Inc., 2011), was used to estimate our final model. We opt for an FIML solution because the information on parents' level of education was not collected for students who graduated in 2007. ~~Indeed~~, FIML is a model-based method for estimating parameters in the presence of missing data. Strictly speaking, it is not an imputation method, since it does not impute missing values into newly created data sets, but provides parameter estimates derived from the available data as well as implied values of the missing data (Arbuckle, 1996). This estimation procedure provides roughly unbiased estimates, particularly with small sample sizes.

The traditional measure for evaluating the overall model fit in SEM is provided by the chi-square statistics. Since severe shortcomings are associated with its use (Kline, 2005), a variety of alternative goodness-of-fit indices have been proposed. There is still disagreement among researchers about the application of these alternative statistics, but a good practice is to reporting a variety of indices (Boomsma, 2000): one should always be the Standardized Root Mean Square Residual (SRMR; Hu and Bentler, 1999); another could be one among the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI) or the Goodness of Fit index (GFI).

The SRMR is a measure of the mean absolute correlation residual; it computes the overall difference between the observed and the predicted correlations. Its main advantage is the lack of any distributional assumption of the outcome variables. SRMR ranges from 0 to 1, where 0 means a perfect model fit. According to Hu and Bentler

(1999)'s ~~rule of thumb~~, SRMR values lower or equal to 0.08 can be considered acceptable.

RMSEA is a popular fit statistic because of its sensitivity to the number of estimated parameters in the model. This index basically follows a non-central chi-square distribution; a value of 0 indicates the *best fit*, even though this does not necessarily mean the *perfect fit*. Most SEM researchers agree on a cut-off value close to 0.06 (Hu and Bentler, 1999) or 0.07 (Steiger, 2007). Moreover, a confidence interval around the value can be specified; in a well-fitting model the lower bound of the 90% confidence interval should be close to 0, while the upper bound should be lower than 0.10 (Browne and Cudeck, 1993).

In SEM applications, some fit indices (i.e. GFI) are undefined under the FIML procedure; even though several other popular fit statistics can ~~be still~~ be computed (Enders, 2001).

2.4. The analytic model

To measure the educational outcomes that are the focus of our analyses, two latent variables were defined through confirmatory factor analysis: job-major match and job satisfaction. The indicators to measure job-major match are: necessity of the achieved degree (its standardized factor score, [sfs], equals 0.589), coherence with studies ($sfs = 0.811$), *forma mentis* (0.560), and adequacy of professional background (0.586). Job satisfaction is measured by: overall job satisfaction (0.751), satisfaction for professionalism (0.710), satisfaction for cultural interests (0.807) and skill exploitation (0.563). Job-major match and job satisfaction are then affected by individual and social characteristics of graduates, as well as their educational paths. Individual and social characteristics of graduates and their university paths are inserted in the model as explanatory variables of job-major match and job satisfaction

~~Figure 1 represents both the structural and measurement equations of the SEM model. The structural model follows a logical and temporal structure: it starts with the choice of high school programme (*liceo* [4] vs. other school types), which may depend on gender and social capital. Parental level of education (both father and mother) and professional activity are assumed as measures of social capital as a latent variable.~~

~~The second step of the model is given by the final grade in high school, which may depend on gender, social capital and high school programme. After high school, young people interested in university studies proceed to choose a course of study (faculty), which in turn also could depend on gender, social capital, high school programme and~~

final grade. The final grade for the university degree may depend again on gender, social capital, high school programme and final grade, and the faculty (school within the university) attended.

~~According to the literature reviewed in the Introduction,~~ The theoretical model behind our analysis is based on the literature reviewed in the Introduction and follows a logical and temporal structure, that is summarised in Figure 1.

Social capital is set at the beginning of the individual educational pathway. The ~~P~~parental level of education (both father and mother) and their professional activities are assumed as measures of social capital as a latent variable. Since Italy shows a low intergenerational social mobility, we might expect a positive relationship between parental socio-economic status and high school choice (~~gymnasium versus all other types of schools~~), as well as social capital and final high school grade. Therefore, gender and social capital are assumed to affect high school choices, while gender, social capital, and high school type are the main determinants of the final high school grade. Since gymnasium is an academic-oriented high school type in Italy, its educational standards are expected to be higher than those of the other high schools; as a result, ~~the gymnasium~~ final grade is expected to be lower than the grade obtained by ~~the~~ students who attended a professional or training system.

The next step of the educational path is the faculty choice, ~~that~~which is assumed to depend on gender, social capital, high school type, and final high school grade ~~and~~; the same variables, together with the attended university course of study, affect in turn the final degree grade. As a consequence of the low intergenerational social mobility trait that characterises Italy, ~~the~~ higher the social capital ~~the most likely~~ results in students ~~most likely~~ attending elitist and historical faculties (such as Law, Medicine, Humanities), ~~whilst these students are less likely~~ ~~they~~o choose other ~~and~~ less traditional university schools.

~~On the one hand,~~ Although we might ~~think~~ ~~the~~ expect that a higher ~~the~~ high school grade will result in a ~~the~~ higher ~~the~~ university grade. ~~On the other hand,~~ because of the university-oriented training provided by the ~~gymnasium~~, a positive relationship between ~~gymnasium~~ attendance and university degree grade is also expected.

For graduates who found a job, the job-major match may depend on gender, high school ~~programme~~ and ~~its~~ final grade, major and level (bachelor or master) of the attended ~~study~~ university programme, and ~~university~~ degree final grade. ~~In this last equation,~~ social capital does not have a direct effect on job-major match. ~~As highlighted in the Introduction,~~ social capital is assumed to affect ~~the job-major match~~ only indirectly ~~job-major match~~.

Finally, we hypothesize that job satisfaction may be directly affected by the same variables affecting the consistency between job and major, and also by the social capital and by ~~In the end, we~~ we therefore hypothesize that job satisfaction may be affected by the same variables defined as explanatory variables investigating the consistency between job and major, plus the latent variable 'job-major match' itself. ~~We assume that social capital may have also direct effects on job satisfaction, because we hypothesize that graduates could find more satisfactory jobs by leveraging social relations, which are generally supposed to be richer and more extensive for parents with higher education and better occupations.~~ We also assume a direct effect of social capital on job satisfaction. Indeed, social capital may be a measure of the networking capabilities of a graduate and his or her family by leveraging social relations, which are generally supposed to be richer and more extensive for parents with higher education and better occupations, graduates are more likely to find more satisfactory jobs.

The model is identified according to the recursive rule with no correlated errors in the endogenous variables (Bollen, 1989). The notation and specification of the SEM model are shown in Appendix 1.

[Figure 1 here]

3. Results

3.1. Job-education match

According to 44.2% of graduates, the degrees they hold are necessary for performing their current job, while 38.1% of graduates believe that any university degree could suffice for their activity (Table 42).

A high variability among disciplines characterizes these data: necessity of the ~~owned-awarded~~ degree ranges from 30.5% for graduates in the humanities area [51] to 57.2% for workers in technical or scientific areas. The interval is even higher if faculties (not shown) are considered. ~~at~~ At one extreme, only 12.7% of graduates in Political Science and 18.6% in Humanities stated that the gained degree was necessary; at the other extreme, 94.0% of graduates in Law and 69.3% in Pharmacy stated that the degree they ~~have had~~ was required for their jobs. A remarkable one out of every four graduates in the Humanities area declared that a high school degree would have sufficed d for their current job.

The slight disadvantage of female graduates with respect to males in job-education consistency is mainly attributable to the higher percentage of women graduating with concentrations in the Humanities. The analysis stratified by faculty (not shown) often reveals no clear pattern of mismatch between male and female graduates: ~~sometimes~~ Sometimes women seem advantaged over men ~~as for~~ with regard to consistency (study programmes in Pharmacy or Education), in other cases (in particular, Agriculture and Economics), men possess this advantage.

~~As expected, the job~~ Job-education mismatch is higher for graduates who achieved a bachelor's degree: ~~only~~ only 30.2% of them gained a job where the achieved degree ~~was~~ is necessary, ~~and, on the opposite side, while~~ and 28.5% ~~can~~ could be considered over-educated. Conversely, more than half of those with master's degrees held a degree appropriate for the job they ~~are~~ were in, and only one out of ten accepted a job for which the possession of a high school degree would have sufficed.

Graduates with better high school and academic performance seem to have jobs that match ~~with~~ their educational levels. Final grades for both high school and university were significantly higher ($p < 0.0001$) for people who found a job that matched ~~up with~~ their higher studies.

~~Given the large heterogeneity in grading practice among the faculties (the lowest average grade was 96.3 for Statistics and the highest was 108.3 for Psychology), The the final university grade seems not to~~ is in better agreement ~~better agree~~ with the level of job-major consistency ~~when the analysis is stratified by faculty (not shown):~~ Graduates in Economics showed a mean grade of 91.3 if a high school diploma was sufficient for their job and a mean of 100.7 if their degree was strictly necessary for their chosen work. Similar results can be observed for Pharmacy (mean values were 90.0 and 100.2, respectively), Humanities (101.0 and 106.4), Engineering (97.3 and 103.2), Statistics (90.7 and 98.8), and Political Science (95.0 and 103.8). final grades vary from 100.2 (for no consistency at all) to 102.9 (for full match), but the analysis of grades suffers from a large heterogeneity in grading practice among the faculties (not shown): the lowest average grade is 96.3 for Statistics and the highest is 108.3 for Psychology. Graduates in Economics show a mean grade of 91.3 if a high school diploma would suffice for their job, and a mean of 100.7 if their degree is strictly necessary for their chosen work. Similar results can be observed for Pharmacy (mean values are 90.0 and 100.2, respectively), Humanities (101.0 and 106.4, respectively), Engineering (97.3 and 103.2), Statistics (90.7 and 98.8) and Political Science (95.0 and 103.8).

Formatted: Font: Italic

From Table 42 it is also worth noting that graduates having the right degree for the job ~~they are in~~, or having a job ~~for which~~that required a university degree ~~is required anyway~~, feel more satisfied with their jobs. Work positions matching ~~with~~ the major of the achieved degree involve higher incomes and, for ~~about half the graduates~~more than 40% of graduates, ~~also a~~ job guarantee.

Parents' education is ~~mildly-weakly~~ related to job-education consistency: ~~for~~For jobs that require specific university titles, a clear tendency exists for parents to be more educated, whilst job mismatches are associated mainly with lower parental educational status. It can be hypothesized that, when choosing a university course, highly educated parents are able to direct descendants towards a proper discipline and, after their graduation, activate their own social networks to help their descendants get better jobs.

[Table 42 here]

The necessity of a certain degree at work is highly correlated with coherence between completed studies: the Goodman and Kruskal co-graduation index $\gamma = 0.671$ is large and significant (95% confidence interval: 0.639-0.702). It is less correlated with indicators of the skills' use: the co-graduation with adequacy of professional background is $\gamma = 0.467$ (0.423-0.511) and with skill exploitation is $\gamma = 0.463$ (0.405-0.520). Indeed, skill exploitation could depend on other aspects in addition to job-education match, such as the organisational structure, the number and role of colleagues, the type and level of tasks (the higher the level and the more diversified the tasks, the more restrained the use of strictly technical skills and the wider that of cross-occupational skills for managing and solving problems).

University studies are generally relevant for ~~labour work~~: 24.8% of graduates very frequently use and another 60.6% quite frequently use the skills acquired at university (Table 23).

The use of superior skills is highly associated with job satisfaction: ~~in~~On a ten-point scale, satisfaction ranged ~~s~~ from 5.5 of 10 if skills are not used to 8.1 if they are repeatedly used. From Tables 42 and 23 we can deduce that 'over-educated' graduates are less satisfied with their jobs, in concordance with the current literature.

[Table 3 here]

3.2. Pathways from social and educational capital to job satisfaction

We now investigate the pathways from graduates' social capital to job satisfaction, moving through high school and university performance. Results are reported in Tables 34 to 40.

The null hypothesis of the chi-square test for evaluating the model fit is rejected. However, model residuals are far from normality. Thus, the SRMR index, which is equal to 0.06, seems to be more apt to evaluate the model's goodness of fit; it is equal to 0.06, has a lower value than the cut-off reported by Hu and Bentler (1999). In addition, the RMSEA statistic is 0.099, a value somewhat larger than the cut-off suggested by Steiger (2007). However, the upper bound of the 90% confidence interval for RMSEA is equal to 0.101, a value right just beyond the upper bound proposed by Browne and Cudeck (1993). Therefore, taking into account the complexity of the estimated model, its fit to the data seems quite good.

[Table 23 here]

Our analysis begins with family social capital. In this paper, the parental socioeconomic background is evaluated by means of the parents' education and employment activity (Table 34). *Ceteris paribus*, parents' education contributes to descendants' social capital to a greater degree than does parents' occupational status. The role played by fathers is stronger compared to the mothers' contribution. Regardless of the indicators, children acquire stronger social capital according to the strength of the position or condition of their parents (Table 34).

[Table 34 here]

Any higher educational career starts with the choice of what the type of high school to attend (Table 45). As expected, family social capital is crucial in choosing high school type; individuals living in better off and better-educated contexts are significantly inclined to choose a *liceo-high-school-programme-gymnasium* ($p < 0.010$). A significant positive direct effect ($p = 0.013$) may be observed for young females.

[Table 45 here]

The final high school grade is negatively correlated ($p < 0.010$) with *liceo-gymnasium* attendance (Table 56). This is likely, due to the fact that, because in general, educational standards and learning diligence required by the *liceo-school-gymnasium* are

higher than those by other high schools. So, the direct effect of ~~the~~ social capital on the final grade is no longer significant. Social capital affects the high school grade through the attended school type ($p < 0.010$) and it is negative because of lower grades achieved by students at ~~liceo schools~~gymnasium. Other things being equal, women get better marks at the end of high school than men ($p < 0.010$).

[Table ~~56~~ here]

The next step in a high school graduate's career is the choice of the study programme and the university to attend (Table ~~67~~). ~~Other things being equal,~~ ~~the~~ high school final grade plays a significant ($p < 0.010$) role in the study programme choice—positive for Economics, Engineering, and Law, negative for the remaining faculties but the Humanities and Statistics (for which it is neutral).

Moreover, having attended a ~~liceo programme~~gymnasium affects directly and positively the choice of a study programme at the faculties of Engineering, Law, Pharmacy and Sciences ($p < 0.010$), and negatively the choice of enrolment in all other faculties but Humanities, Psychology and Statistics. Indirect effects are always often in the opposite direction than direct ones (because the indirect effect passes through the high school final grade, ~~that which~~ is lower for ~~liceo gymnasium~~) ~~with the exception of attendance of the Pharmacy and Economics programmes (for which indirect effects of the high school type follow the same direction of the direct effect—positive for the former faculty and negative for the latter one) and Humanities and Statistics programmes (both direct and indirect effects are not significant).~~

Women are inclined to choose programmes in Education, Pharmacy, Psychology, or Humanities (the total effects are significant: $p < 0.010$), ~~even though indirect effects are negative (Education and Psychology) or not significant (Pharmacy and Humanities).~~ This is a new demonstration that, in comparison to men, young women tend to choose liberal arts and health programmes in larger numbers (the faculty of Medicine did not contribute to the survey, but two-thirds of its students are women).

The role of ~~family~~ social capital on the choice of the study programme is noteworthy: ~~the~~ the more substantial the social capital, the larger the tendency to choose Engineering or Law programmes. The opposite applies to the Education and Agriculture programmes, which means that the higher the parents' status the less likely students are to enrol in these faculties after graduating from high school.

[Table ~~67~~ here]

A further step in one's higher educational career is graduation (Table 78). Other factors being equal, the final grade of women is higher than that of men (analogously to high school). Social capital still shows important effects, that are stronger ($p < 0.010$) ~~from when~~ indirect ~~slants~~ and weaker ($p = 0.043$) when direct ~~directly~~. The sum of these two effects is positive and significant with ~~the~~ stronger ~~the~~ family social capital resulting in a ~~the~~ higher ~~the~~ final university grade ($p < 0.010$). Both variables representing high school attendance (type of school and final grade) mutually agree: a positive and significant direct effect is opposed to a negative and significant indirect effect. Merging the two effects, we obtain a positive and significant overall effect of the basic high school descriptors on marks at graduation.

Apart from Pharmacy (which is not statistically different with respect to Veterinary Medicine), faculties show significant direct effects on the final mark: students in Economics or Statistics get the lowest grades at graduation, while the highest are in Education, Humanities and Psychology. Hence, in interpreting the effectiveness of the study programme on graduates' external outcomes, it will be necessary to mentally stratify the final marks by faculty.

[Table 78 here]

~~The effect of gender on the graduation grade is positive and significant, all other variables kept constant. Our findings about the effects of gender, faculty and high school attendance are consistent with the international literature (Hossler and Stage, 1992; Trusty, 2004).~~

The last stage of our analysis is to investigate if and how the human (that is, the merge of social and educational) capital accumulated by these graduates affects job quality, as measured by job-major match and job satisfaction.

We sketched in Figure 1 that ~~the~~ social capital indirectly affects ~~indirectly~~ the gap between major and skills used by graduates at work, but, according to the estimated model, this relationship is not significant (Table 89). The high school final grade comes outshines as a good predictor of a student's ability, rather than the graduation final grade: both the direct and the indirect effects of the high school grade on job-major consistency are significant ($p < 0.010$), while the effects of the final grade are not, ~~once the former is in~~. This is not a surprise ~~and sheds light on the debate about when the destiny of graduates was written. In particular, is the university graduation mark alone able to effectively discriminate graduates who can use their major-specific skills at~~

work from others who cannot? Probably not, as evidence exists of a wide heterogeneity across faculties as well as homogeneity within faculties in terms of the final grade. As anticipated in Section 3.1, large proportions of students in liberal arts, or in education or psychology programmes, attain top grades, while in other programmes (in particular, in economics or statistics) the average grades are rather low.

Thus, the 'filter' of the grading styles of university programmes downgrades the predictive capacity of university performance as measured by the final mark; it is the *lieeo-gymnasium* attendance together with the high school final mark that remains a good predictor of a graduate's use of major-specific skills. To support this view, we can observe from Table 89 shows that the effects of *lieeo-gymnasium* attendance and those of the attended faculty work in different directions with respect to job-major consistency: the effects of the former attendance are positive and indirect ($p=0.044$), and no direct effects are significant, while the indirect effects of the latter-attended faculty are not significant (for Engineering, Sciences and Statistics programmes even the direct and total effects are not significant). Other aspects being the same, and with respect to Veterinary Medicine as a measurement baseline, the attendance of a programme in Agriculture, Political Science, *Sociology-Humanities*, or Psychology has a negative direct effect on the consistency between university major and the achieved skills use, while a the opposite relationship positive effect applies for programmes in the faculties of Economics, Pharmacy, Education, Law, and Engineering.

[Table 89 here]

Hence, the choice of the faculty is the crucial step in one's educational pathway because it may affect in a positive or a negative manner the education that graduates can use to their advantage in the labour market. The match between education and work activity is also lower with lower degree levels (bachelor versus master degree).

As expected, if job skills match with the university major, even job satisfaction will be large high ($p<0.01$), all other things being the same (Table 910). However, for some majors or for graduates entering a sluggish labour market, finding any job could be cause for satisfaction. Nevertheless, job satisfaction has a multidimensional nature and job-major match represents just one of the facets: earning, occupational position, worked hours, contract terms, physical and social work context, and task autonomy are other relevant aspects of this complex concept. In this work we do not control for most of these personal and contextual aspects, because our goal is not to investigate job satisfaction causes or educational returns on job satisfaction. The relationship between

expectations from and satisfaction with a job can explain why the direct effect of the bachelor's degree on job satisfaction is positive and significant ($p < 0.010$), signalling that bachelor-graduates with bachelor's degrees are more satisfied with their job than those with master's degrees-ones. This inverse -than-of what is expected relationship is likely due to the lower expectations of lower titled graduates.

On the other hand, if mediated by job-major matching, the job satisfaction of a bachelors graduate is lower than that of a master's graduates; bachelors-Bachelors are less satisfied because of lower job-major matching (indirect effect); but more satisfied because of lower expectations (direct effect). The merge of the direct and indirect effects results in ~~the~~ lack of total effects of the degree level on job satisfaction. This finding can be considered a valuable example of the advantages provided by our approach in disentangling direct from indirect effects.

In relation to job satisfaction, the university final grade is not significant, while the high school final grade still presents a positive and significant indirect effect ($p < 0.010$). No faculty shows a negative and significant direct relationship with job satisfaction; Only programmes in Agriculture, Education, Political Sciences, Psychology, and Humanities show significant direct effects and; other than programmes in Education, all of these also have a negative indirect effect. In order to understand such results, it is to be noted that the labour expectations of graduates from the liberal arts or social programmes are low, and often ~~they~~these graduates might feel that ~~even~~just finding a job was amazing, regardless of the low consistency between their job activities and their past studies. After controlling for the different stages of the educational career, social capital vanishes as a covariate of job satisfaction.

~~In the end, e~~Even if women perform better than men with respect to both ~~to~~ school and university outcomes, their job-major consistency is lower than that of males, both directly ($p = 0.026$) and indirectly ($p = 0.017$). This may mean that jobs gained by women are less qualified than those of equally educated men. Women are also less satisfied than men with their jobs ($p = 0.019$), ceteris paribus.

[Table 910 here]

4. Conclusions and discussion

A major conclusion of our analyses is that the proportion of graduates from Padua University with more skills than required by their job is lower than the percentages usually detected in Italy and Europe. Padua is located in northeastern Italy, a geographical region whose economic system, unlike that of the rest of Italy, is affected

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

by the presence of 'local production systems'. These areas are characterised by high concentrations of small and medium-sized firms in manufacturing and service activities, high levels of innovation, and a strong relationship with universities and research centres.

There is evidence that graduates' occupational destiny is strongly affected by the choice of the type of high school and university study programme. The reason is strictly social. For any individual, there is a common thread from family social status to high school and performance, from high school's distinctive features to a higher educational programme and performance, and from that on to work. Our results clearly show that in Italy the type of high school is a crucial step in the individual educational pathway and might shape the future professional career. The counselling and orientation activities provided by both teachers and the family environment assume a key role in the educational career of each youth. These activities have to be carried out at early stages of any educational path, probably earlier than expected. The choice of the high school is likely driven by parents, relatives, and sometimes youths' friends. This means that social capital strongly determines one's outcomes until the end of high school. Policies should be devoted to enhance both the mentoring support of the 'educators', according to the skills, abilities, and expectations of their students, and the conscious parental involvement in their children's high school choices. This finding strongly supports other conclusions for the Italian case. Checchi (2000) argued that 'the educational career is significantly predetermined by the choice of the secondary school undertaken at the age of 14, mainly by the family'; Checchi and Jappelli (2004) claimed that 'since parents make decisions on the basis of their perception of school quality, it would be important to improve parents' information about school characteristics and students' performance in later schooling'.

Regarding university studying, it is evident that the match between education and work activity is lower with the lowest degree level, and this could signal a failure of the bachelor programme in Italy. Bachelor studies are supposed to have a more occupational-oriented character than the master ones; hence, bachelor graduates should be more likely to find a job qualified as matched. It is likely that the current characteristics of the Italian bachelor degree do not achieve the purposes behind this branch of university reform. Policy should be devoted to fill in the current gap in order to really improve training provided by this low degree level.

Our mismatch rate ranged between 17.7% (overt irrelevance of the university title) and 55.8% (included 38.1% of cases for which any university degree would be equally valid). We are tempted to state that overeducation is an inappropriate term and, as

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

claimed by Caroleo and Pastore (2013), there is a skill mismatch due to ‘wrong’ abilities. In effect, skills mismatch and low job satisfaction are greater for majors of a nontechnical nature (Political Science, Humanities, and Psychology). Thus, the university major is pivotal in determining the graduates’ perception of being over- or undereducated and of being satisfied with the job they are in. The different degrees are relevant signals of the skills held by graduates, possibly affecting an individual’s chance of finding a qualified job.

We conclude that it would be beneficial for a higher educational institution to both appraise which jobs are the ‘graduate jobs’ (the job market share for graduates) and to inform students of this appraisal at any stage of their lives—before they choose a higher educational programme, when they are in it, and at its end. On the other hand, students should and can change such a rather deterministic social chain between social capital, high school choice and results, higher educational choices and final grade, and occupation. A student might be able to design his/her own investments in higher education and long-term labour strategies. This calls for strategic counselling at the very early stages of choosing a path through higher education. This type of counselling, which should involve a forecast of the occupational opportunities in a plausible future, is likely to enhance students’ positive attitudes towards choosing a university path that is labour-oriented, even if this purpose may be weakened if labour markets are poor.

Notes

[1] Disciplinary areas are: Humanities (Humanities Psychology, Education), Social Science (Economics, law, Political Science, Statistics), Life Sciences (Veterinary Medicine, Pharmacy, Agriculture), Technical and Scientific (Engineering, Science).

References

- Allen, J. and Van der Velden, R. (2001), “Educational mismatches versus skill mismatches: Effects on wages, job satisfaction and on-the-job search”, *Oxford Economic Papers*, Vol. 53, pp. 434-52.
- Allen, J. and Van der Velden, R. (2007), “The Flexible Professional in the Knowledge Society: General Results of the REFLEX Project”, Research Centre for Education and the Labour Market Maastricht University, The Netherlands.
- Allen, J. and de Weert, E. (2007), “What do educational mismatches tell us about skill mismatches? A cross-country analysis”, *European Journal of Education*, Vol. 42, pp. 59-73.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
- Arbuckle, J.L. (1996), "Full information estimation in the presence of incomplete data", in Marcoulides, G.A. and Schumacker, R.E. (Eds.) *Advanced Structural Equation Modeling*, Lawrence Erlbaum Associates Inc., Mahwah, NJ, pp. 243–77.
- Battu, H., Belfield, C.R., and Sloane, P.J. (1999), "How well can we measure graduate over-education and its effects?", *National Institute Economic Review*, Vol. 171, pp. 82-93.
- Boccuzzo, G. and Gianecchini M.(2014), "Measuring Young Graduates' Job Quality through a Composite Indicator", *Social Indicator Research*, DOI: 10.1007/s11205-014-0695-6.
- Bollen K. (1989), *Structural Equations with Latent Variables*, Wiley, New York.
- Boomsma, A. (2000), "Reporting analyses of covariance structures", *Structural Equation Modeling*, Vol. 7, pp. 461-83.
- Browne, M.W. and Cudeck, R. (1993), "Alternative ways of assessing model fit", in Bollen, K.A. and Long, J.S. (Eds.) *Testing Structural Equation Models*, Sage, Newbury Park, CA, pp. 136-62.
- Büchel, F. and Pollmann-Schult, M. (2004), "Overeducation and human capital endowments", *International Journal of Manpower*, Vol. 25, pp. 150-66.
- Caroleo, F.E. and Pastore, F. (2012), "Talking about the Pigou Paradox. Socio-Educational Background and Educational Outcomes of AlmaLaurea", *International Journal of Manpower*, Vol. 33, pp. 27-50.
- Caroleo, F.E. and Pastore, F. (2013), "Overeducation at a Glance: Determinants and Wage Effects of the Educational Mismatch, Looking at the AlmaLaurea Data", IZA Discussion Paper No. 7788 , Germany.
- Cecchi, D. (2000), "University education in Italy", *International Journal of Manpower*, Vol. 21, pp. 177 – 205.
- Cecchi, D. (2006), *The Economics of Education: Human Capital, Family Background and Inequality*, Cambridge University Press, Cambridge.
- Cecchi, D. and Jappelli, T. (2004), "School Choice and Quality", CEPR Discussion Papers 4748, C.E.P.R. Discussion Papers.
- Chevalier, A. and Lindley, J. (2009), "Over-education and the skills of UK graduates", *Journal of the Royal Statistical Society, Series A*, Vol. 172, pp. 307-37.
- Corak, M. (2004), *Generational Income Mobility in North America and Europe*, Cambridge University Press, Cambridge.
- Cuttillo, A. and Di Pietro, G. (2006), "The effects of overeducation on wages in Italy: A bivariate selectivity approach", *International Journal of Manpower*, Vol. 27, pp. 143-68.
- Dalal, R.S. (2005), "A meta-analysis of the relationship between organizational citizenship behavior and counterproductive work behavior", *Journal of Applied Psychology*, Vol. 90, pp. 1241-55.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14 Dolton, P. and Vignoles, A. (2000), "The incidence and effects of overeducation in the
15 U.K. graduate labour market", *Economics of Education Review*, Vol. 19, pp. 179–
16 198.
- 17 Dustmann, C. (2004), "Parental background, secondary school track choice, and
18 wages", *Oxford Economic Papers*, Vol. 56, pp. 209–230.
- 19 Enders, C.K. (2001), "A Primer on Maximum Likelihood Algorithms Available for Use
20 With Missing Data", *Structural Equation Modeling*, Vol. 8, pp. 128-41.
- 21 Ermisch, J. and Francesconi, M. (2001), "Family matters: impacts of family
22 background on educational attainments", *Economica*, Vol. 68, pp. 137–156.
- 23 Fabbris, L. (2012), "Preface: Graduates as informants of higher education
24 effectiveness", in Fabbris, L. (Ed.), *Indicators of Higher Education Effectiveness*,
25 McGraw-Hill Education, Milan, pp. V-XI.
- 26 Farrell, D. and Stamm, C.L. (1988), "Meta-analysis of the correlates of employee
27 absence", *Human Relations*, Vol. 41, pp. 211–27.
- 28 Flint, T.A. (1992), "Parental and planning influences on the formation of student
29 college choice sets", *Research in Higher Education*, Vol. 33, pp. 689-708.
- 30 Ganzach, Y. (2003), "Intelligence, education and facets of job satisfaction", *Work and
31 Occupations*, Vol. 30, pp. 97-122.
- 32 Garrouste, C. (2010), "100 Years of Educational Reforms in Europe: A contextual
33 database" Luxembourg: Publications Office of the European Union, EUR 24487
34 EN.
- 35 Green, F. and Zhu, Y. (2010), "Overqualification, job dissatisfaction, and increasing
36 dispersion in the returns to graduate education", *Oxford Economic Papers*, Vol. 62,
37 740-63.
- 38 Hearn, J.C. (1984), "The relative roles of academic, ascribed, and socioeconomic
39 characteristics in college destinations", *Sociology of Education*, Vol. 57, pp. 22-30.
- 40 Hu, L.T. and Bentler, P.M. (1999), "Cutoff Criteria for Fit Indexes in Covariance
41 Structure Analysis: Conventional Criteria Versus New Alternatives", *Structural
42 Equation Modeling*, Vol. 6, pp. 1-55.
- 43 Kline, R.B. (2005), *Principles and Practice of Structural Equation Modeling* (2nd ed.),
44 The Guilford Press, New York.
- 45 Koslowsky, M., Sagie, A., Krausz, M. and Singe, A.D. (1997), "Correlates of employee
46 lateness: Some theoretical considerations", *Journal of Applied Psychology*, Vol. 82,
47 pp. 79–88.
- 48 Leuven, E. and Oosterbeek, H. (2011), "Overeducation and Mismatch in the Labor
49 Market". IZA Discussion Paper No. 5523. Available at SSRN:
50 <http://ssrn.com/abstract=1771245>.
- 51 Maynard, D. C., Joseph, T. A. and Maynard, A. M. (2006), "Underemployment, job
52 attitudes, and turnover intentions." *Journal of Organizational Behavior*, Vol. 27, pp.
53 509-36.
54
55
56
57
58
59
60

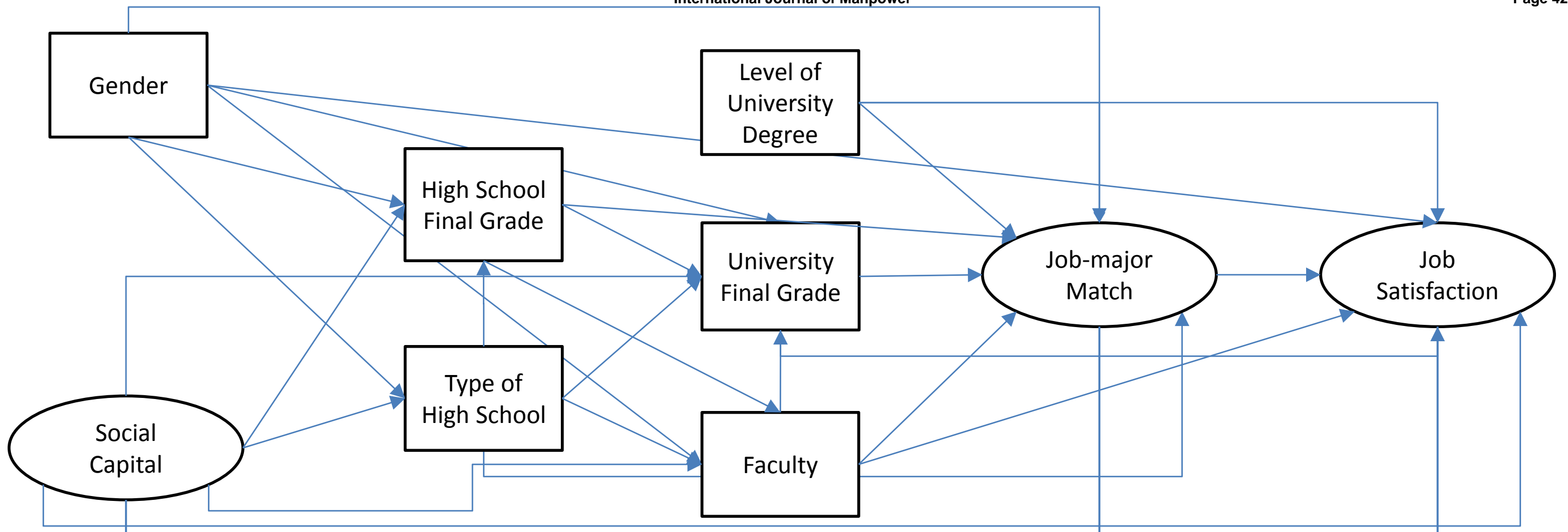
- 1
2
3
4
5
6
7
8
9
10
11
12
13
14 Poggi, A. (2010), "Job satisfaction, working conditions and aspirations", *Journal of*
15 *Economic Psychology*, Vol. 31, pp. 936-49.
- 16 Robert, P. (2014), "Job mismatch in early career of graduates under post-communism",
17 *International Journal of Manpower*, Vol. 35, pp. 500-13.
- 18 SAS Institute Inc. (2011), *SAS/STAT 9.3 User's Guide*, SAS Institute Inc., Cary, NC.
- 19 Skalli, A., Theodossiou, I. and Vasileiou, E. (2008), "Jobs as Lancaster goods: Facets
20 of job satisfaction and overall job satisfaction", *Journal of Socio-Economics*, Vol.
21 37, pp. 1906-20.
- 22 Solon, G. (1999), "Intergenerational Mobility in the Labor Market," in Ashenfelter,
23 O.C. and Card, D. (Eds), *Handbook of labor economics*, Vol. 3, Part A, North-
24 Holland, Amsterdam, pp. 1761-1800.
- 25 Sousa-Poza, A. and Sousa-Poza, A.A. (2000), "Well-Being at Work: A Cross-National
26 Analysis of the Levels and Determinants of Job Satisfaction", *Journal of Socio-*
27 *Economics*, Vol. 29, pp. 517-38.
- 28 Steiger, J.H. (2007), "Understanding the limitations of global fit assessment in
29 structural equation modelling", *Personality and Individual Differences* Vol. 42, pp.
30 893-98.
- 31 Verhaest, D. and Omey, E. (2009), "Objective overeducation and worker well-being: A
32 shadow price approach", *Journal of Economic Psychology*, Vol. 30, pp. 469-481.
- 33 Wolniak, G.C. and Pascarella, E.T. (2005), "The effects of college major and job field
34 congruence on job satisfaction", *Journal of Vocational Behavior*, Vol. 67, pp. 233-
35 51.
- 36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Figure 1: Structural Equation Model analysing education effectiveness

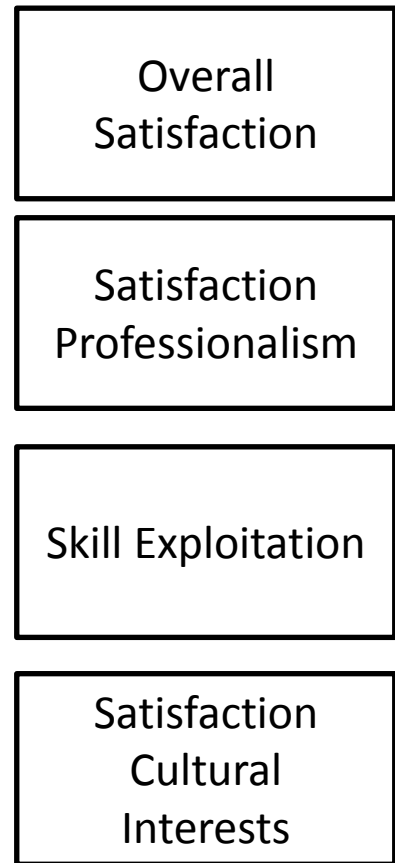
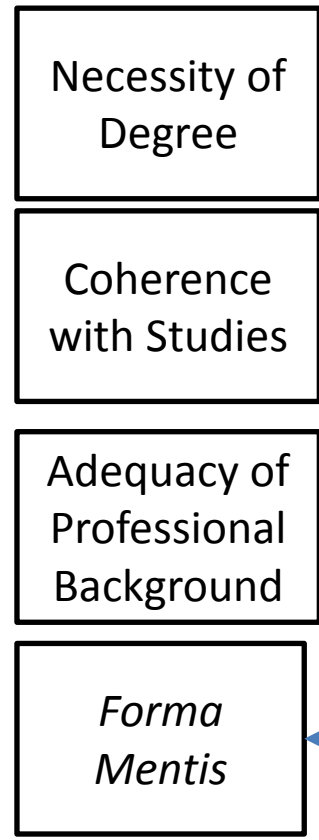
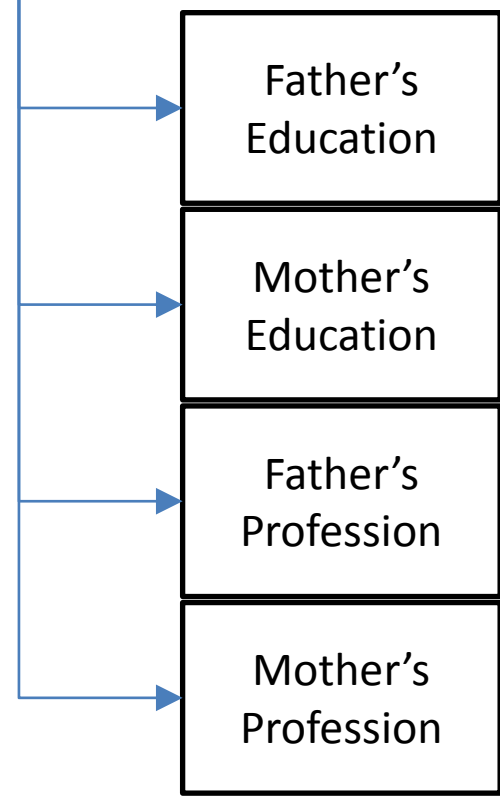
For Peer Review

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60



Structural Model

Measurement Model



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1 Sample size and response rate at every wave of the survey.

	Initial sample size	Enrolled again ^a	Actual sample size	Non respondents	Interviewed	Response rate ^b	Employed
6 months	4,769	802	3,967	225	3,742	94.3%	2,443 (65.3%)
1 year	3,742	274	3,468	299	3,169	91.4%	2,426 (76.6%)
3 years	3,443	151	3,292	558	2,734	83.0%	2,436 (89.1%)

^a People excluded from the initial sample because, after the graduation, they enrolled again into a University course longer than one year.

^b Interviewed/actual sample size

For Peer Review

Table 2 Distribution of employed graduates according to the necessity of their degrees for their job functions and other characteristics

	<i>The degree is necessary (%)</i>	<i>Any degree suffices (%)</i>	<i>High school suffices (%)</i>	<i>Even lower education (%)</i>	<i>Total (%)</i>	<i>Sign.</i>
All graduates (n=2,042)	44.2	38.1	16.7	1.0	100	
Graduates' characteristics						
<i>Male (n=870)</i>	47.6	38.1	13.9	0.5	100	0.0017
<i>Female (n=1,172)</i>	41.7	38.1	18.8	1.4	100	
<i>Father's level of education:</i>						
<i>Low (n=538)</i>	41.1	35.9	21.6	1.5	100	0.0041
<i>Medium (n=541)</i>	42.9	39.7	16.1	1.3	100	
<i>High (n=231)</i>	51.1	37.7	11.3	0	100	
<i>Mother's level of education:</i>						
<i>Low (n=597)</i>	42.9	33.8	21.8	1.5	100	0.0035
<i>Medium (n=554)</i>	43.9	40.6	14.4	1.1	100	
<i>High (n=166)</i>	45.8	42.2	12.1	0	100	
<i>Bachelor degree (n=779)</i>	30.2	41.3	27.1	1.4	100	<0.0001
<i>Master degree (n=1,263)</i>	52.9	36.1	10.3	0.7	100	
<i>Humanities (n=649)</i>	30.5	42.1	25.7	1.7	100	<0.0001
<i>Social sciences (n=434)</i>	38.2	47.0	14.5	0.2	100	
<i>Life sciences (n=338)</i>	54.4	28.4	15.4	1.8	100	
<i>Technical scientific (n=621)</i>	57.2	33.0	9.5	0.3	100	
<i>Years for getting degree – Bachelor's (mean)</i>	4.8	4.8	4.9	4.5	4.8	0.648
<i>Years for getting degree – Master's (mean)</i>	3.4	2.9	3.0	2.6	3.2	<0.0001
<i>Final grade (mean)</i>	102.9	102.3	100.5	100.2	102.2	<0.0001
<i>High school grade (mean)</i>	84.9	82.3	81.2	78.9	83.3	<0.0001
Job characteristics						
<i>Hourly income (Euros, mean)</i>	7.8	7.6	6.7	6.3	7.5	<0.0001
<i>Overall job satisfaction (mean)</i>	7.6	7.5	6.8	6.4	7.4	<0.0001
<i>% permanently employed</i>	41.2	44.9	39.0	25.0	42.1	0.091
<i>% self-employed</i>	9.6	5.8	6.2	5.0	7.5	0.017

Notes: Parents' educational data have been collected only for 64% of graduates.

Table 3 Characteristics of employed graduates and their jobs according to skills' exploitation

	Skills' exploitation				Total (%)	Sign.
	A lot (%)	Quite well (%)	Not much (%)	Not at all (%)		
All graduates (n=2,046)	24.8	60.6	12.6	2.0	100	
Graduates' characteristics						
<i>Male (n=872)</i>	27.4	61.3	10.6	0.7	100	<0.0001
<i>Female (n=1,174)</i>	22.9	60.1	14.0	3.0	100	
<i>Father's level of education:</i>						
<i>Low (n=539)</i>	24.3	58.6	14.7	2.4	100	0.037
<i>Medium (n=543)</i>	25.1	62.2	11.2	1.5	100	
<i>High (n=232)</i>	31.5	58.6	7.3	2.6	100	
<i>Mother's level of education:</i>						
<i>Low (n=597)</i>	23.9	60.0	13.7	2.3	100	0.055
<i>Medium (n=557)</i>	25.1	62.1	11.1	1.6	100	
<i>High (n=167)</i>	34.7	55.1	7.8	2.4	100	
<i>Bachelor degree (n=782)</i>	22.6	60.1	14.8	2.4	100	0.031
<i>Master degree (n=1264)</i>	26.2	60.9	11.2	1.7	100	
<i>Humanities (n=651)</i>	23.8	58.1	15.4	2.8	100	0.027
<i>Social sciences (n=434)</i>	24.2	61.3	12.7	1.8	100	
<i>Life sciences (n=340)</i>	25.6	58.2	13.8	2.3	100	
<i>Technical scientific (n=621)</i>	25.9	64.1	8.9	1.1	100	
<i>Years for getting degree – Bachelor's (mean)</i>	4.7	4.9	4.8	4.7	4.8	0.726
<i>Years for getting degree – Master's (mean)</i>	3.2	3.2	3.2	3.3	3.2	0.974
<i>Degree grade (mean)</i>	102.6	102.1	102.0	102.5	102.2	0.642
<i>High school grade (mean)</i>	83.8	83.7	81.2	76.9	83.2	0.0002
Job characteristics						
<i>Hourly income (Euros, mean)</i>	7.9	7.5	7.1	6.6	7.5	<0.0001
<i>Overall job satisfaction (mean)</i>	8.1	7.5	6.2	5.5	7.4	<0.0001
<i>% permanently employed</i>	42.3	42.9	39.3	34.1	42.1	0.526
<i>% self-employed</i>	10.0	7.5	3.9	0.0	7.5	0.005

Table 4 Factor loadings of the latent variable 'social capital'

Indicator	Estimate
Father's occupation: high qualification	2.329*** (0.306)
Father's occupation: low qualification	-3.762*** (0.411)
Mother's occupation: high qualification	0.758*** (0.132)
Mother's occupation: low qualification	-1.914*** (0.240)
Mother's occupation: housewife	-2.018*** (0.311)
Father's educational level: high	4.268*** (0.465)
Father's educational level: low	-6.044*** (0.645)
Mother's educational level: high	3.281*** (0.369)
Mother's educational level: low	-6.284*** (0.667)

Notes: *** p-value<0.01, ** p-value<0.05, * p-value<0.1.
Standard errors in parentheses.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 5 Total, direct and indirect standardised effects on the choice of high school

Variable	Total	Direct	Indirect
Female	0.054** (0.021)	0.054** (0.021)	--
Social capital	0.384*** (0.024)	0.384*** (0.024)	--

Notes: *** p-value<0.01, ** p-value<0.05, * p-value<0.1.
Standard errors in parentheses

For Peer Review

Table 6 Total, direct and indirect standardised effects on high school final grade

Variable	Total	Direct	Indirect
Female	0.091*** (0.022)	0.095*** (0.022)	-0.004* (0.002)
Social capital	0.008 (0.028)	0.037 (0.031)	-0.028*** (0.010)
Gymnasium attendance	-0.074*** (0.025)	-0.074*** (0.025)	--

Notes: *** p-value<0.01, ** p-value<0.05, * p-value<0.1.
Standard errors in parentheses

For Peer Review

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 7 Direct, indirect and total standardised effects of graduates' characteristics
on the choice of the study programme, by faculty

	Variable	Total	Direct	Indirect
Agriculture	Female	-0.1677*** (0.0215)	-0.1573*** (0.0216)	-0.0105 (0.0032)***
	Social capital	-0.0847*** (0.0270)	-0.0610** (0.0300)	-0.0238** (0.0097)
	<i>Gymnasium</i> attendance	-0.0544** (0.0246)	-0.0602** (0.0246)	0.0058** (0.0025)
	High school final grade	-0.0792*** (0.0218)	-0.0792*** (0.0218)	--
Economics	Female	0.0334 (0.0221)	0.0266 (0.0222)	0.0068* (0.0035)
	Social capital	0.0396 (0.0274)	0.0558* (0.0304)	-0.0162 (0.0101)
	<i>Gymnasium</i> attendance	-0.0520** (0.0250)	-0.0445* (0.0249)	-0.0075** (0.0030)
	High school final grade	0.1019*** (0.0220)	0.1019*** (0.0220)	--
Education	Female	0.1752*** (0.0213)	0.1938*** (0.0210)	-0.0186*** (0.0045)
	Social capital	-0.1712*** (0.0264)	-0.1255*** (0.0292)	-0.0456*** (0.0101)
	<i>Gymnasium</i> attendance	-0.1059*** (0.0242)	-0.1159*** (0.0240)	0.0100*** (0.0037)
	High school final grade	-0.1357*** (0.0212)	-0.1357*** (0.0212)	--
Engineering	Female	-0.03352*** (0.0196)	-0.3585*** (0.0191)	0.0233*** (0.0545)
	Social capital	0.0994*** (0.0257)	0.0725*** (0.0279)	0.0270** (0.0106)
	<i>Gymnasium</i> attendance	0.0494** (0.0234)	0.0655*** (0.0228)	-0.0160*** (0.0056)
	High school final grade	0.2181*** (0.0199)	0.2181*** (0.0199)	--
Law	Female	0.0312 (0.0221)	0.0171 (0.0220)	0.0140*** (0.0038)
	Social capital	0.1127*** (0.0272)	0.0790*** (0.0302)	0.0337*** (0.0100)
	<i>Gymnasium</i> attendance	0.0779*** (0.0248)	0.0855*** (0.0247)	-0.0076** (0.0030)
	High school final grade	0.1035*** (0.0219)	0.1035*** (0.0219)	--
Humanities	Female	0.2165*** (0.0211)	0.2200*** (0.0212)	-0.0035 (0.0026)
	Social capital	-0.0172 (0.0268)	-0.0056 (0.0299)	-0.0116 (0.0095)
	<i>Gymnasium</i> attendance	-0.0281 (0.0244)	-0.0297 (0.0245)	0.0015 (0.0017)
	High school final grade	-0.0210 (0.0217)	-0.0021 (0.0217)	--
Pharmacy	Female	0.0691*** (0.0220)	0.0700*** (0.0219)	-0.0009 (0.0043)
	Social capital	0.0299 (0.0274)	-0.0192 (0.0302)	0.0491*** (0.0104)
	<i>Gymnasium</i> attendance	0.1361*** (0.0246)	0.1297*** (0.0246)	0.0064** (0.0027)
	High school final grade	-0.0873*** (0.0219)	-0.0873*** (0.0219)	--
Political Sciences	Female	0.0104 (0.0222)	0.0258 (0.0221)	-0.0154*** (0.0040)
	Social capital	-0.0078 (0.0275)	0.0223 (0.0304)	-0.0301*** (0.0103)
	<i>Gymnasium</i> attendance	-0.0664*** (0.0250)	-0.0756*** (0.0248)	0.0092*** (0.0035)

	High school final grade	-0.1247*** (0.0219)	-0.1247*** (0.0219)	---
Psychology	Female	0.1632*** (0.0216)	0.1715*** (0.0216)	-0.0083*** (0.0030)
	Social capital	0.0668** (0.0271)	0.0811*** (0.0301)	-0.0143 (0.0098)
	<i>Gymnasium</i> attendance	-0.0305 (0.0247)	-0.0357 (0.0247)	0.0052** (0.0024)
	High school final grade	-0.0703*** (0.0219)	-0.0703*** (0.0219)	--
Science	Female	-0.0092*** (0.0220)	-0.0997*** (0.0220)	0.0077** (0.0031)
	Social capital	0.0134 (0.0274)	-0.0165 (0.0304)	0.0299*** (0.0098)
	<i>Gymnasium</i> attendance	0.0743*** (0.0248)	0.0771*** (0.0249)	-0.0028 (0.0019)
	High school final grade	0.0384* (0.0221)	0.0384* (0.0221)	--
Statistics	Female	-0.0096 (0.0221)	-0.0048 (0.0223)	-0.0048* (0.0027)
	Social capital	-0.0781*** (0.0274)	-0.0653** (0.0305)	-0.0128 (0.0097)
	<i>Gymnasium</i> attendance	-0.0303 (0.0250)	-0.0328 (0.0250)	0.0024 (0.0019)
	High school final grade	-0.0330 (0.0222)	-0.0330 (0.0222)	--

Notes: *** p-value<0.01, ** p-value<0.05, * p-value<0.1. Standard errors in parentheses.
Reference: Veterinary medicine.

Peer Review

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 8 Direct, indirect and total standardised effects of graduates' characteristics on university final grade

Variable	Total	Direct	Indirect
Female	0.198*** (0.021)	0.081*** (0.020)	0.117*** (0.016)
Social capital	0.125*** (0.027)	0.051** (0.025)	0.075*** (0.018)
Gymnasium attendance	0.125*** (0.024)	0.172*** (0.020)	-0.047*** (0.015)
High school final grade	0.363*** (0.019)	0.400*** (0.018)	-0.037*** (0.012)
Faculty (Ref: Veterinary Medicine)			
Agriculture	0.081*** (0.018)	0.081*** (0.018)	–
Economics	-0.080*** (0.018)	-0.080*** (0.018)	–
Education	0.126*** (0.018)	0.126*** (0.018)	–
Engineering	0.083*** (0.019)	0.083*** (0.019)	–
Law	0.067*** (0.018)	0.067*** (0.018)	–
Humanities	0.226*** (0.018)	0.226*** (0.018)	–
Pharmacy	-0.001 (0.018)	-0.001 (0.018)	–
Political Science	0.081*** (0.018)	0.081*** (0.018)	–
Psychology	0.285*** (0.018)	0.285*** (0.018)	–
Science	0.064*** (0.018)	0.064*** (0.018)	–
Statistics	-0.072*** (0.018)	-0.072*** (0.018)	–

Notes: *** p-value<0.01, ** p-value<0.05, * p-value<0.1. Standard errors in parentheses

Table 9 Direct, indirect and total standardised effects of graduates' characteristics on job-major match

Variable	Total	Direct	Indirect
Female	-0.115*** (0.025)	-0.051* (0.026)	-0.064*** (0.017)
Social capital	0.012 (0.016)	–	0.012 (0.016)
<i>Gymnasium</i> attendance	0.060** (0.025)	0.033 (0.024)	0.027** (0.014)
High school final grade	0.157*** (0.024)	0.091*** (0.026)	0.066*** (0.017)
Faculty (Ref: Veterinary Medicine)			
Agriculture	-0.073*** (0.023)	-0.076*** (0.023)	0.003 (0.002)
Economics	0.069*** (0.023)	0.072*** (0.023)	-0.003 (0.002)
Education	0.084*** (0.023)	0.079*** (0.024)	0.004 (0.004)
Engineering	0.035 (0.025)	0.032 (0.025)	0.003 (0.002)
Law	0.047** (0.023)	0.044* (0.023)	0.002 (0.002)
Humanities	-0.258*** (0.023)	-0.266*** (0.023)	0.008 (0.006)
Pharmacy	0.052** (0.023)	0.052** (0.023)	-0.0001 (0.001)
Political Sciences	-0.143*** (0.023)	-0.146*** (0.023)	0.003 (0.002)
Psychology	-0.272*** (0.022)	-0.282*** (0.024)	0.010 (0.008)
Science	-0.009 (0.023)	-0.011 (0.023)	0.002 (0.002)
Statistics	-0.028 (0.023)	-0.025 (0.023)	-0.002 (0.002)
Bachelor degree	-0.186*** (0.022)	-0.186*** (0.022)	–
University final grade	0.034 (0.028)	0.034 (0.028)	–

Notes: *** p-value<0.01, ** p-value<0.05, * p-value<0.1. Standard errors in parentheses

Table 10 Direct, indirect and total standardised effects of graduates' characteristics on job satisfaction

Variable	Total	Direct	Indirect
Female	-0.057** (0.024)	-0.028 (0.025)	-0.029 (0.021)
Social capital	0.042 (0.028)	0.048 (0.029)*	-0.006 (0.010)
<i>Gymnasium</i> attendance	0.018 (0.018)	–	0.018 (0.018)
High school final grade	0.070*** (0.019)	–	0.070*** (0.019)
Faculty (Ref: Veterinary Medicine)			
Agriculture	-0.017 (0.025)	0.039* (0.022)	-0.055*** (0.017)
Economics	0.038 (0.024)	-0.014 (0.022)	0.052*** (0.017)
Education	0.110*** (0.025)	0.052** (0.022)	0.058*** (0.017)
Engineering	-0.007 (0.026)	-0.031 (0.023)	0.024 (0.018)
Law	0.015 (0.024)	-0.018 (0.022)	0.033* (0.017)
Humanities	-0.083*** (0.025)	0.110*** (0.024)	-0.193*** (0.019)
Pharmacy	0.023 (0.024)	-0.015 (0.022)	0.038** (0.017)
Political Science	-0.060** (0.024)	0.046** (0.022)	-0.106*** (0.017)
Psychology	-0.068*** (0.024)	0.136*** (0.024)	-0.204*** (0.020)
Science	-0.024 (0.024)	-0.016 (0.022)	-0.008 (0.017)
Statistics	-0.007 (0.024)	0.012 (0.022)	-0.019 (0.017)
Bachelor degree	-0.032 (0.025)	0.104*** (0.023)	-0.136*** (0.017)
University final grade	0.004 (0.029)	-0.021 (0.024)	0.025 (0.021)
Job-major match	0.730*** (0.025)	0.730*** (0.025)	–

Notes: *** p-value<0.01, ** p-value<0.05, * p-value<0.1. Standard errors in parentheses

Appendix 1. Variables used in SEM model

Symbol	Variable	Description
η_5	Job-major match	Latent endogenous variable
η_6	Job satisfaction	Latent endogenous variable
ζ_1	Social capital	Latent exogenous variable
$y_1=\eta_1$	High school	Dichotomous (1: <i>liceo</i> / 0: other)
$y_2=\eta_2$	High school final grade	60-100 scale
$y_{31}=\eta_{31}$	Faculty: Agriculture	Eleven dichotomous variables referred to faculties (Reference: Faculty of Veterinary Medicine)
...		
$y_{3\ 11}=\eta_{3\ 11}$	Faculty: Statistics	
$y_4=\eta_4$	University degree final grade	66-110 scale
y_{51}	Necessity of degree	Dichotomous (1: yes / 0: no)
y_{52}	Job-major coherence	1-10 scale
y_{53}	<i>Forma mentis</i>	Dichotomous (1: very much+quite / 0: not at all+not much)
y_{54}	Adequacy of professional background	1-10 scale
y_{61}	Overall job satisfaction	1-10 scale
y_{62}	Satisfaction with professionalism	1-10 scale
y_{63}	Satisfaction with cultural interests	1-10 scale
y_{64}	Skill exploitation	Dichotomous (1: very much+quite / 0: not at all+not much)
x_{11}	Father's education: high	Dichotomous (1: at least degree / 0: other)
x_{12}	Father's education: low	Dichotomous (1: junior high school or lower / 0: other)
x_{13}	Mother's education: high	Dichotomous (1: at least degree / 0: other)
x_{14}	Mother's education: low	Dichotomous (1: junior high school or lower / 0: other)
x_{15}	Father's occupation: high	Dichotomous (1: manager, entrepreneur and similar / 0: other)
x_{16}	Father's occupation: low	Dichotomous (salaried worker or similar)
x_{17}	Mother's occupation: high	Dichotomous (manager, entrepreneur and similar)
x_{18}	Mother's occupation: low	Dichotomous (1: salaried worker or similar / 0: other)
x_{19}	Mother's occupation: housewife	Dichotomous (1: yes / 0: no)
$x_2=\zeta_2$	Gender	Dichotomous (1: Female / 0: Male)
$x_3=\zeta_3$	Type of degree	Dichotomous (1: Bachelor / 0: Master degree)

Appendix 2. Specification of SEM model.

$$x_{11} = \lambda_{111}\xi_1 + \delta_{11}$$

$$x_{12} = \lambda_{121}\xi_1 + \delta_{12}$$

...

$$x_{19} = \lambda_{191}\xi_1 + \delta_{19}$$

$$x_2 = \lambda_{22}\xi_2 + \delta_2 \quad ({}_x\lambda_{22} = 1 \text{ and } \text{Var}(\delta_2) = 0)$$

$$x_3 = \lambda_{33}\xi_3 + \delta_3 \quad ({}_x\lambda_{33} = 1 \text{ and } \text{Var}(\delta_3) = 0)$$

$$y_1 = \lambda_{11}\eta_1 + \varepsilon_1 \quad ({}_y\lambda_{11} = 1 \text{ and } \text{Var}(\varepsilon_1) = 0)$$

$$y_2 = \lambda_{22}\eta_2 + \varepsilon_2 \quad ({}_y\lambda_{22} = 1 \text{ and } \text{Var}(\varepsilon_2) = 0)$$

$$y_3 = \lambda_{33}\eta_3 + \varepsilon_3 \quad ({}_y\lambda_{33} = 1 \text{ and } \text{Var}(\varepsilon_3) = 0)$$

$$y_{51} = \lambda_{515}\eta_5 + \varepsilon_{51}$$

....

$$y_{54} = \lambda_{545}\eta_5 + \varepsilon_{54}$$

$$y_{61} = \lambda_{616}\eta_6 + \varepsilon_{61}$$

....

$$y_{64} = \lambda_{646}\eta_6 + \varepsilon_{64}$$

$$\eta_1 = \gamma_{11}\xi_1 + \gamma_{12}\xi_2 + \zeta_1$$

$$\eta_2 = \beta_{21}\eta_1 + \gamma_{21}\xi_1 + \gamma_{22}\xi_2 + \zeta_2$$

$$\eta_{31} = \beta_{311}\eta_1 + \beta_{312}\eta_2 + \gamma_{311}\xi_1 + \gamma_{312}\xi_2 + \zeta_{31}, \dots,$$

$$\eta_{311} = \beta_{3111}\eta_1 + \beta_{3112}\eta_2 + \gamma_{3111}\xi_1 + \gamma_{3112}\xi_2 + \zeta_{311}$$

$$\eta_4 = \beta_{41}\eta_1 + \beta_{42}\eta_2 + \beta_{431}\eta_{31} + \dots + \beta_{4311}\eta_{311} + \gamma_{41}\xi_1 + \gamma_{42}\xi_2 + \zeta_4$$

$$\eta_5 = \beta_{51}\eta_1 + \beta_{52}\eta_2 + \beta_{531}\eta_{31} + \dots + \beta_{5311}\eta_{311} + \beta_{54}\eta_4 + \gamma_{52}\xi_2 + \gamma_{53}\xi_3 + \zeta_5$$

$$\eta_6 = \beta_{61}\eta_1 + \beta_{62}\eta_2 + \beta_{631}\eta_{31} + \dots + \beta_{6311}\eta_{311} + \beta_{64}\eta_4 + \beta_{65}\eta_5 + \gamma_{61}\xi_1 + \gamma_{62}\xi_2 + \gamma_{63}\xi_3 + \zeta_6$$