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Horizontal Inequalities in Higher Education

Abstract: This paper aims to answer two questions concerning inequalities in tertiary education. First question concerns the effect of social origin on choice of field of study and the second question concerns the effect of gender. Existing research has demonstrated a significant relation between social background and the field of study. Individuals with more educated parents are more likely to study at prestigious faculties, such as law or medicine. Women are more willing than men to choose humanities and social studies whereas men more often choose technical studies. Will these patterns continue in the face of the rapid increase in number of students which began in Poland in the 1990s? A survey conducted in three state higher-education establishments in Białystok in 2008 shows that students' choices continue to be affected both by social background and gender. We also found a significant relationship between the field of study and general risk-proneness. These results are explained in terms of three different theories: cultural capital, critical theory, and rational choice.

Keywords: horizontal educational inequality; higher education; stratification; educational selection.

According to the Central Statistical Office in 2009 enrollment rate at higher level of education in Poland was 53.7%. At first glance, the dramatic increase in number of students since the 1990s may suggest that inequality in access to higher education has been reduced. Previous research have demonstrated time and again that the distributive aspect of inequality has indeed been systematically diminishing. However, although the number of years of schooling in society in general is systematically increasing, it does not mean that the correlation with social background will diminish. It is now one of the key hypotheses of educational inequality research that despite the increasing eligibility for higher education, class barriers continue to limit access to a university level diploma among the lower strata of society (Mare 1980; Shavit & Blossfeld 1993). It is believed that what the expansion of education has really led to is not the reduction of background-related inequality but the aggravation of horizontal inequalities in the educational structure (van de Werfhorst & Kraaykamp 2006; Shavit, Arum & Gamoran 2007). The increasingly dense network of higher educational establishments and the proliferation of new fields of study are forcing the high school graduate not only to decide whether or not to continue education but also to decide what to study and where. Considerable differences between and within higher education institutions are a fact and various academic rankings published in media keep reminding us about it. These rankings help the student-to-be to get a grasp of the current prestige hierarchy and social scientists view them as an indicator of

stratification within the higher education system. The question is why some candidates choose establishments or fields from the bottom of the ranking list whereas others go for the top of the list.

This article focuses on two possible determinants of choice of field of study: social background and gender. The conclusions are based on the results of a survey conducted in three public (i.e. state) universities in Białystok in 2008. Revealing a relationship between social background and field of study should shed new light on the process of generating educational inequalities. One of the objectives of this study is to fine-tune the hypothesis, which has functioned since the 1980s, that inequalities decline across thresholds (Mare 1980). Our analysis may very well demonstrate that, despite the increasing enrolment, social background is still the decisive factor in the choice of more prestigious options in higher education. Second, the fact that more women than men study does not necessarily mean that there are no longer gender-related barriers in access to field of study. Is the choice of faculty still a membrane dividing different social strata despite the rapid increase in number of students? Do men and women continue to make traditional choices? Before answering these questions I'm going to present a theoretical introduction which will provide basis for formulation of hypotheses and a context for interpreting the results.

Three Hypothetical Determinants of Educational Choices

Let us first situate the problem of social selection in higher education within a theoretical framework. There are three possible interpretations: conflict theory, cultural capital theory and rational choice theory. The most important assumption of the first paradigm is that education is instrumental for the reproduction of one's position in social structure. Thanks to cultural, financial and social resources, members of the upper classes are able to offer their offspring a better education which in turn will give the latter access to prestigious jobs on the labour market. One of the scholars sharing this perspective is Randal Collins. He suggests that ramified certification systems are means in the hands of economic elites who grant access to the most lucrative professions only to people of similar status (Collins 1979). Max Weber (1968) and his contemporary follower Frank Parkin (1979) also drew attention to this role of education. In their opinion, education serves to monopolize access to social rewards and forms of activity reserved for the advantaged groups.

The main conclusions from the empirical research converge with these theoreticians' approaches. German analyses have demonstrated that although social status is relatively insignificant as far as choice of most fields of study is concerned, representatives of the upper classes are more likely to study prestigious fields such as medicine or law whereas students from lower rungs of the social ladder are more likely to choose social, economics or engineering courses (Reimer & Pollak 2006). Other researchers found similar patterns. Access to most fields was relatively equal but again law and medicine attracted the largest number of students from elite backgrounds (Bratti 2003). Pierre Bourdieu and Jean Passeron (Bourdieu & Passeron 1977) and recently

Samuel Lucas (2001) suggested a conceptual framework for these patterns. In their opinion, educational expansion induced the dominant classes to send their children to universities. This process led to the emergence of a more hierarchical educational structure, offering various qualities of higher education. Underlying the prestigious or just seemingly prestigious diplomas are implicit mechanisms of background selection which induce lower-class students to choose the sciences, languages or technical courses and members of the elite to choose philosophy or law (Lucas 2001; Bourdieu & Passeron 1977).

Whether we conclude that these preferences are deliberate or are the outcome of a specific socialization which shaped high aspirations depends on how we understand these findings. The latter suggest that social reproduction via education is a fact albeit one of limited scope. Herman Werfhorst and Ruud Luijkx analyzed horizontal inequality in Holland and found that future students more often chose fields similar to their parents' professions. This pattern was stable and was confirmed for a variety of faculties but its intensity depended on social status: reproduction was more likely for categories with family academic traditions (Van de Werfhost & Luijkx 2006). Operationalizing the language of monopolization theories we can formulate the following hypothesis: elites have greater access to prestigious fields of study such as law or medicine.

The second source of hypotheses explaining the choice of field of study is cultural capital theory. According to Bourdieu and Passeron, the configuration of origin variables embodied in cultural dispositions is the key determinant of educational careers. Research in Western Europe and the United States of America has confirmed that parental reading habits (De Graff 1986) and other forms of cultural participation (Aschaffenburg & Mass 1997) have a positive effect on offspring achievement. The question is will these resources affect the decision concerning majors just as they do at lower levels of education? Some researchers found only a small effect of cultural capital and this was explained by students' relative independence from their family background (Mare 1980; Aschaffenburg & Mass 1997). However, it should be taken into account that that the dilemma concerning selection of fields at the most general level (social versus technical studies) is usually resolved at the secondary level—by attending certain high school (general versus technical) and profile within the school. Decisions concerning tertiary education are the effect of accumulated capital at home, reinforced at every prior level of education, rather than the spontaneous choices, independent of one's entire educational biography.

Basing on cultural capital theory we may assume that representatives of the upper classes will be positively selected for social and humanistic disciplines. Beside the fact that the latter provide a general world-knowledge and encourage critical thinking and social awareness, they are also viewed as traditional recruitment channels to the higher social strata. The reason for this is perhaps more deep-seated. Bourdieu and Passeron argue that the most precious form of capital and the one which is decisive for academic success is language. The ability to express one-self nicely consolidates social divisions because it exposes the distance between the way one communicates at home and academic jargon. The greater the distance, the more likely it is that

"commoner" students will study such fields as biology or chemistry, i.e. fields that place few demands on students with respect to elegant thought formulation (Bourdieu & Passeron 1977). To summarize: in light of the conceptions of these French scholars we may assume that individuals more favourably positioned in the social structure and more culturally competent will be more likely to choose courses which put more emphasis on rhetorical competence such as the humanities and social studies than to choose the sciences where linguistic capital is less essential.

Human capital theory (Boudon 1974; Goldthorpe 1996) takes a different approach to educational choices. It begins with the assumption that decisions concerning educational careers are based on cost/benefit analysis. Students and their families assumedly have sufficient information about the educational market to make rational assessments of the costs of education and the benefits of a diploma upon completion of a given educational pathway. The research findings suggest that students at various stages of their education are able to make down-to-earth assessments of the financial benefits of their education (Dominitz & Manski 1996; Davies et al. 2001; Botelho & Pinto 2004). Every decision involves a certain amount of risk, however. When deciding to continue our education we are unable to foresee with hundred-percent certainty that our calculations will be accurate and that investment will in fact yield the expected benefits. Neither can we be certain that a student will pass all the examinations successfully. If he or she fails, the financial cost, the time spent on learning, and the income one could have earned (had one spent that time working instead of studying) cannot be reclaimed. The risk of investment loss may be particularly important for representatives of the lower classes who, for fear of failure, may decide to terminate their education earlier or to choose less demanding pathways. In their case, the choice of more selective fields means intergenerational upward mobility but failure means loss of the opportunity to gain a university degree of any kind. Therefore, uncertainty of the future forces them to weigh their potential more carefully and if possible to do this on the basis of actual skills and previous educational achievement. Rational choice theorists argue that the key element in the decision process is to adhere to the relative risk aversion principle. This means that young people will make decisions which will either ensure advancement compared with their parents' position or at the very least, reproduction of parental position.

In the light of rational choice theory we may assume that students from higher socio-economic background will choose fields of study more selectively, first because even were they to fail, the loss would be less acute, and second because the high standards set by their parents' social status will strongly disincline them to degradation. Representatives of the lower classes will be more likely to choose fields which are generally thought to be easier to complete.

Gender-Related Selection

The most general pattern which emerges from the research on gender-related selection is the overrepresentation of women in social fields and men in technical fields

(Gerber & Schaefer 2004; Smyth & Hannan 2006). Janet Chafetz, a representative of the critical school, explains that gender-related stratification is a function of socially-accepted definitions of masculine and feminine roles. The more crystallized the belief in inherent differences between women and men, the greater the inequality (Chafez 1990). The life decisions which representatives of both sexes make are seemingly voluntary but in fact we do what we ought to do, as men and women, conforming to stereotypes and expectations ingrained in the bloodstreams of generation after generation. Bourdieu calls these expectations symbolic violence. Individuals fall prey to this violence during their socialization and various institutions such as school, church or state reinforce it. More important still, the coerced individual also maintains it (Bourdieu 2001). One clear manifestation of beliefs in what sort of education is proper for boys and girls are parental aspirations. A study conducted in the late 1990s found that parents were twice as likely to choose general secondary schools for girls than for boys and this pattern was repeated at all levels of the occupational structure (Domański 2002). The gender gap at the university level has gradually lessened within the last few years. As late as 1993, 27% of parents wanted a higher vocational education for their son but only 17% wanted one for their daughter. In 2007 the proportions for sons and daughters were 17% and 12% respectively (CBOS 2007). Parental preferences affect also the skills which their offspring acquire, even at the level of initial socialization. Women's lack of interest in technical matters manifests itself later in their lower competence regarding modern technology (so called 'digital gap') (cf. e.g. Volk & Ming 1999).

Alternatively, we can look at the gender-related choice of fields in terms of investment and expected returns upon graduation. Gender significantly differentiates between the estimation of profits to be gained from education. Women usually expect lower financial returns than men (Botelho & Costa 2004). Davis and Gruppy argue that in the USA men more often than women choose fields of study which are hoped to be a source of greater financial returns upon completion like engineering or science (Davies & Gruppy 1997). The reason for women's lower financial aspirations may lie in their different value systems. The high rank of maternity in women's hierarchy of life success causes them to pay less attention to financial success.

Data and Variables

My analysis aims to answer three questions regarding traditional patterns of background selection during educational expansion. First one refers to the monopolization hypothesis—the question is whether people of higher social background are more likely to choose prestigious fields and if so, what is the range of this phenomenon. I'm also going to determine the proportion of students of upper-class origin in other, less prestigious subjects. The second question, stemming from cultural capital hypothesis, concerns the preferential selection of the humanities and social studies by children from the aforementioned, advantaged families. Finally gender-related segregation will be examined. Additionally, I want to know whether more risk-prone individuals choose the prestigious majors more often.

The analysis is based on data collected in 2008 at three state universities, all situated in the same city: the University of Białystok (U), the Medical University (MU) and the Polytechnic of Białystok (P). Only full-time graduate and bachelor course sophomores were questioned (evening and extramural students were not included). Survey was conducted during classes, but excluding specialization and language tutorials (in order to avoid pre-selection effects). The sample size was proportional to the total number of students at each university and in each field (N = 906). Social background (measured in terms of parental education), gender, and place of residence were the independent variables. The detailed operationalization of variables will be given with the results.

Social Background and Horizontal Selection

Let us begin with a discussion of differences at the most general level, i.e. between universities. The question we want to answer is: which university recruits the largest number socially advantaged students (and whether the differences between universities are significant). The mean value of educational homogamy index (defined as the situation where both mother and father have higher education) indicates that more than double the number of students with a higher social background study at MU (23%) than at P (10%) or U (9.5%). The medical university is clearly the breeding ground for the elite whereas the two other are (in those terms) less selective. The fact that the strength of background barriers at P and U is similar may be attributed to the considerable diversity of courses offered at both these universities. The fact that they are offering both science and social faculties, ones which are more and less prestigious, offsets their selective power—these institutions attract students from various social strata. No such process can be observed at the MU, whose educational offer is relatively homogeneous and profiled. Although we cannot make temporal comparisons, we can hypothesize that the increase in number of students in recent years, combined with the increasing diversity of courses, has diminished the effect of selective barriers at the polytechnics and general universities. No such process has taken place at medical universities which have limited freedom of manoeuvre as far as new courses are concerned. We used the ANOVA to check whether the differences between the three institutions were significant.[1] Between-group comparison of means revealed a significant difference ($p < 0.001$) between MU and the two other, but not between P and U.

Let us now analyze the background differences more thoroughly. Figure 1 shows the mean value of the level of parental education index[2] for 13 faculties and 3 colleges.[3] The faculty stratification hierarchy replicates the hypothetical pattern according to

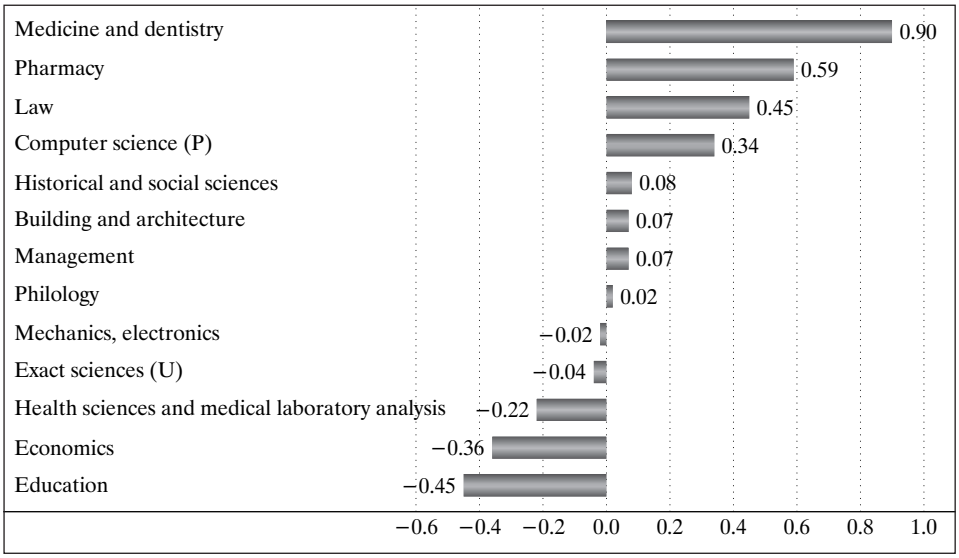
[1] ANOVA with a post-hoc Tukey test was adopted. The dependent variable was binary-coded parental educational homogamy (the value 1 was assigned when both mother and father had complete higher education) and college was the grouping variable.

[2] This index is based on the father's and mother's level of education. It assumes 5 categories. When one parent had higher education one point was added and when either father or mother did not have a secondary school diploma one point was subtracted. In other words, the index was −2 when neither

which the largest proportion of upper-class students can be found at the most prestigious faculties. The medical and dentist faculties open their doors particularly widely to students with better educated parents, followed directly by a third faculty at the same Medical University and then by law. Let us try to explain why this is so. Law and medical studies attract a large portion of men and women who want to invest their inherited capital in the literal sense (they want to continue the family professional tradition) or in the more metaphorical sense (linguistic or cultural distinction). Both fields of study lead to prestigious professions, of which it is openly said in public discourse that they are relatively inaccessible for people completely unconnected to respective professional milieus. As common knowledge has it—it's easier to become a doctor or lawyer when someone in one's close circle is already a member of one of these professions. Besides, the data presented below also indicate that there is considerable occupational reproduction among the higher strata.

Figure 1

Parental education index for different fields of study



Lower-background students at medical and legal fields are also worthy of attention. In their case, the lack of advantageous social position must be compensated for by other capital which induced them to choose such fields. Perhaps they did well at high school and hence developed enough self-confidence or someone in their

father nor mother had a secondary school diploma, 2 when both parents had higher education, 0 when both parents had secondary education and so on.

[3] Some fields of study were combined due to the low frequency of observations. Exact subjects at U include biology, chemistry, mathematics, and physics. Because the data for these fields are combined, I use the terms faculty and field of study interchangeably.

nearest environment stimulated their high aspirations. Investment in such prestigious occupations is a long-term investment. Not only must candidates complete the normal course of study. They must then specialize and sit more examinations qualifying them to practice their profession. If lower-class students fail they will pay a much higher price than their upper-class peers. But if they succeed, their profit will be relatively higher because they had to climb more rungs on the social ladder.

We may only speculate on why these lower-class students do not choose less prestigious but also less selective courses, such as health sciences and medical laboratory analysis, instead of the long years of hard study and uncertainty of success. What we can say, with considerable certainty, is that these students had more barriers to overcome during the entrance examinations than their more socially privileged peers. Whether or not the proportions would be closer to 1.00 among senior students must also remain a purely hypothetical question.

Despite the high position of law in the structure presented in Figure 1, this field seems to be much more egalitarian than the two medical departments. It attracts a considerable number of students who are still aspiring to high but not inherited social status. The difference in the share of upper-class students between law and medicine or dentistry may perhaps be attributed to the greater flexibility of the legal profession. A diploma in law opens the access to many jobs in the state administration or private firms without having to take prolonged legal training and professional exams. Presumably the background structure of pupilage candidates will be quite similar to the structure at both the medical departments. Physicians do not enjoy such flexibility and so medical studies are more risky.

Computer science is fourth on the list of upper-class students' preferences. There is a nine-point difference between IT and law but the motives behind the decision to study one or the other field may be quite different. Traditional definition of prestige does not seem to be the motivating factor as far as IT is concerned because, although employers have been very willing to employ information technologists recently and technological demands have made them an indispensible link in institutional functioning, IT specialists enjoy less status than physicians or lawyers. (Differences in status within the IT profession are quite a different story. Software writers have more status than implementers of existing software.)[4] It is quite probable that one of the incentives behind choice of IT is hope of a well paid and attractive job.

Next on the list are humanistic, social and technical studies. The background structure at the history and sociology, building and architecture, and management faculties is almost identical. Interestingly, architecture which has similar professional status to medicine and law is not attractive enough for candidates with well-educated parents. Apparently a technical degree is a profitable career path for people who have no family capital but are sufficiently talented to pass all their exams for which they can hope to be rewarded by upward mobility. Philology is the boundary between students whose parents often have higher education and students whose parents are

[4] We may take it for granted, however, that the occupational prestige hierarchy created by young people will differ from the classification produced by the general population. Technical and engineering occupations may rank quite highly.

less educated. A degree in languages offers outlets to at least several jobs, some more prestigious and well-paid than others, but none of these options, and no specific subject within the philological discipline, is interesting enough to attract upper-class high-school graduates. As far as the remaining fields are concerned, our attention is drawn to economics, at the very bottom of the list. Are economic studies really a school of enterprise which increases the chances of social advancement? To answer this question we must first analyze graduates' biographies but the fact that only small proportion of children of well-educated parents choose this subject suggests that this might indeed be the case. Even more socially disadvantaged students choose education. It's the most popular choice in Poland, but attracts students from lower-class backgrounds.

The patterns which have emerged do not corroborate the second of our hypotheses according to which social studies are more popular than the exact or technical sciences. The picture is not so simple. The data suggest that there are considerable differences in background structure, even between similar fields. This can be seen in the distance between history and sociology students on the one hand and students of education on the other hand, or between IT students and mechanics students. Perhaps the assumptions of cultural capital theory coined in the 1970s, according to which students from upper-class background prevail among the humanistic disciplines, now need to be revised due to the present demands of the labour market which is increasingly rewarding technical skills. Paradoxically, social and humanistic faculties, which expect their students to have acquired considerable linguistic proficiency at home, are seldom able to attract upper-class children. Disciplines which have always been considered elite enclaves continue to be at the top of the list. Reproduction via education continues to govern distribution of the most coveted places whatever the enrolment rate.[5]

It is noteworthy that the hierarchy of fields with respect to social background exhibits patterns which go beyond the three hypotheses tested here. The list of determinants of choice of majors cannot be reduced to the rewards gleaned from one's future job, the need to maintain one's social position, or differences in cultural capital. These mechanisms may have different effects on the unequal share of students inheriting high levels of education. Monopolization may be caused either by differences in educational aspirations depending on one's background or by the fact that, even when aspirations are similar, not everybody will be able to realize them. The contribution of each of these factors to social selection still needs to be explored but we already know that it is doubtful whether the problem can be solved unequivocally by studying students' declarations alone. Explanations based only on so-called internal concepts would have to assume that high-school graduates' decisions are calculated

[5] The background disproportions between faculties are statistically significant. ANOVA tests (with post-hoc Tukey tests) show that at least one faculty differs significantly from the remaining ones in terms of background structure ($p < 0.001$). To be more precise, the medical and dentistry faculty differs from all remaining faculties except pharmacy, law and IT. Pharmacy differs significantly from education whereas law differs significantly from education and economics, and differs at the borderline level from health sciences and management.

and completely conscious. How exactly particular preferences develop and how they are rationalized ex post facto is another matter altogether.

Also, how the data are analyzed depends on the structure of the college. We may formulate the hypothesis, to be tested on other student populations, that vocational faculties (including such prestigious ones as law and medicine) attract a higher proportion of lower-class candidates than faculties which offer general knowledge but no specific practical training. The latter, such as philosophy, may continue to attract mainly those high-school graduates who are more interested in knowing how to "play the glass bead game" than in financial gains.

Risk Proneness and Educational Decisions

We are now going to see whether more risk-prone individuals do indeed choose more prestigious fields of study as hypothesized by adherents of rational choice theory. The following questionnaire item measured risk-proneness: "If, on completing your studies, you had the choice of a job paying 1500 zloties a month that you were certain you would not lose for a long time and a job paying 2500 zloties but associated with the risk of rapid loss, which job would you choose?" Table 1 shows the results of three between-group tests. In the first test I compared binary-defined (0/1) risk in the group of students whose fathers had higher education with the group of students whose fathers did not have higher education. In the second test I compared students representing the four disciplines with the highest parental education indexes (medicine and dentistry, pharmacy, law, and information technology) with the remaining students. In the third test the explanatory variable was interaction between risk level and parental education and the grouping variable was the distinction between more and less prestigious fields. Between-group differences were significant in all three tests. Students whose fathers had higher education more often declared that they would make the risky decision, as did students who actually studied at prestigious faculties. The result of the second test approaches the adopted level of significance (0.05) but the hypothesized pattern emerged when the interaction with education was tested. The last test tells us about differences between colleges with respect to differences in risk-proneness.

Table 1

Risk level by social background and field of study: t-test (t) and levels of freedom (df)

	t	df
Differences in mean risk level in students whose fathers had higher or incomplete higher education	2.79	326.4
Differences in mean risk levels in students studying prestigious subjects and remaining students	2.05	336.6
Differences in mean levels of risk level x parental higher education interaction in students studying prestigious courses and remaining students	4.86	250.0
Differences between colleges	F = 3.899	2

All results significant at $p < 0.05$.

These results suggest that the decision to choose a prestigious field of studies is related to higher financial aspirations, even if higher income were to be short-lived. The fact that willingness to take risks is higher among students with socioeconomically advantaged background reflects the patterns found by American researchers in the 1950s (Hyman 1962). As I said before, resources in upper-class families ensure that if offspring fails in her or his educational path, this will not have serious consequences. Studying a prestigious fields leading to a widely, highly esteemed profession may be one of the sources of the self-confidence which is a trait of the typical upper-class mentality. Representatives of the lower classes, meanwhile, base their life decisions on premises which ensure employment stability, decent income and sense of security. In their case, getting a university degree is probably a success in itself rather and choosing an ambition major is a secondary matter. Many of them are just beginning to pave the academic way in their families, as attested to by their parents' low level of education. Interestingly, a trait which—according to theory—is a typically lower-class quality, disappears in students who already study prestigious fields. I found no significant differences in readiness to take risks between social strata at medicine, pharmacy, law and IT. There are two possible interpretations of this result. Perhaps socialization among peers with higher aspirations, together with the prospect of obtaining a highly esteemed profession, corrected the previous reluctance to take risks among lower-status students. On the other hand, these people may already have been more risk-prone before they went to university. Self-confidence may just as well have been the factor which led to their choice of a prestigious field of study.

Differences in levels of "risk proneness" between majors are shown in Table 2. Students of medicine and dentistry are significantly different from students of education and computer science. The difference between the first pair of fields shows greater risk proneness among future doctors and the difference between the second pair shows greater risk proneness among future information technologists.

Table 2

Risk-proneness at different faculties

(A)	(B)	Difference between means (A−B)	Level of significance
Medicine and dentistry	Education	0.210	0.007
	Computer science	−0.208	0.023
Pharmacy	Education	0.352	0.001
Law	Education	0.260	0.002
Computer science	Exact sciences (U)	0.239	0.010
	Building and architecture	0.235	0.006
	Mechanical, electrical	0.178	0.034
	Philology	0.209	0.040
	Economics (U)	0.219	0.020
	Education	0.419	0.000

Only results at $p < 0.05$ are shown.

Like law, pharmacy differs from education only, the latter having the lower mean score. Contrary to expectations following from the background hypothesis, but consistent with contemporary labour market patterns, most IT students would make a risky decision. This attitude distinguishes IT students from the other students (except medical students) studying the exact sciences, mechanical and electrical sciences, philology, economics, education, building and architecture.

Gender-Related Stratification

Now let us analyze the third research problem, i.e. gender-related stratification. According to the hypothesis which is well-rooted in international research findings, women were expected to be in the majority at the social, humanistic and medical faculties and men were expected to be in the majority at the legal and technical faculties. First let us analyze differences at the most general level (Table 3). As predicted, the largest proportion of women studied at U (72.5%) and MU (66.4%) and the lowest proportioned studied at P (33.8%). The differences between the polytechnic and the medical university, and between the polytechnic and the university are significant ($p < 0.001$, between-group comparisons).The segregation index is another indicator of the level of selection. It shows how many men and women at each college we would have to move to obtain equal gender proportions.[6] Segregation is greatest at P where over 45% of the women or men would have to be moved, and it is lowest at MU where over a third of the students would have to be moved to obtain an egalitarian distribution.

Table 3

Percentage of women at the three colleges and segregation index values

	% of women	Segregation index
Polytechnic	33.8	45.3
Medical University	66.4	29.9
University	72.5	37.5

Chi^2 102.472, df = 2, $p < 0.001$.

Now let us see how the different fields of study differ with respect to gender ratio. The values in Figure 2 show the extent to which the proportions of women and men depart from 50%, i.e. the situation where each gender was equally represented. We may take the Central Statistical Office (GUS) statistics as our point of reference. According to GUS, 58% of day students at Białystok colleges were women. It is enough just to take a glance at the figure to see that there are more women than men at most of the faculties we studied. When we our data into 35 fields of study, however, we find that the percentage of women is lower than 50% in only 9 cases

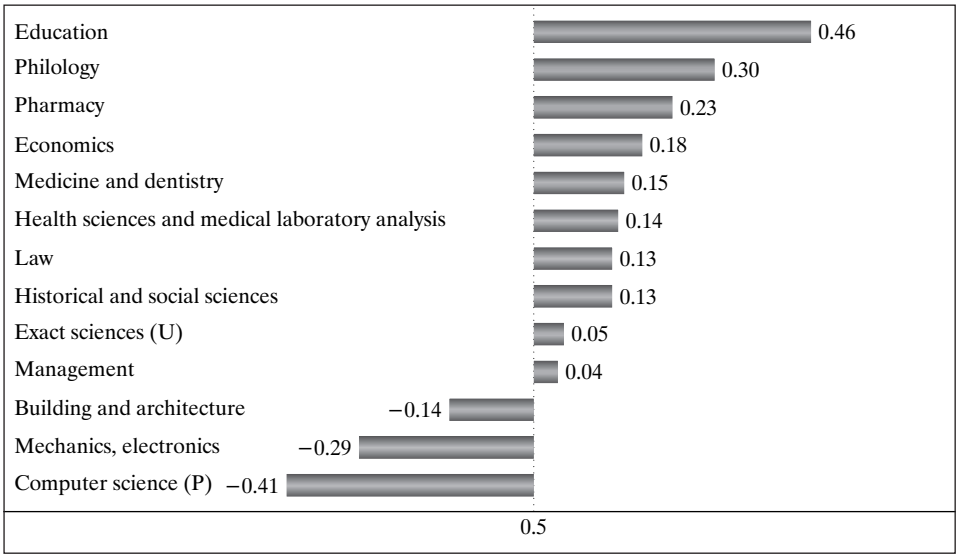
[6] This index is computed according to the following formula: $D = \sum | (F_j/F) - (M_j/M)*1/2*100$, where Fj and Mj are the numbers of women and men studying a particular subject, and F and M are the total numbers of women and men studying at a particular university. A value of 0 means lack of segregation by gender and 100 means complete segregation by gender.

out of 35. Female dominance is highest for education (96% of all students studying that subject). This is counterbalanced by computer sciences where only 8.88% of students are female. Here, as with education, we would have to move 40% of the students to obtain an equal gender ratio. The next faculties with a large women-to-men imbalance are philology (80.5%) and pharmacy (72%). The prevalence of women among medical students replicates the pattern found by other researchers but in contrast to other studies this pattern is not confirmed for law where we found more women than men. We only found a prevalence of male students at three faculties: IT (already mentioned), building and architecture (60%), and the mechanical and electrical faculty (78.7%).

The more detailed breakdown (not discussed here) revealed further differences. When we analyzed 35 different courses we found that the most feminized were: biology (94% female), nursing (80%) and mathematics (72%). Interestingly, the proportion of women studying IT at the polytechnic is similar to the proportion of women studying IT at the university. The distribution shown in Figure 2 converges with popular opinions as to which fields are appropriate for women or men. The overrepresentation of women can be found at courses associated with child-care, other kinds of care, and education whereas technical faculties are still typically masculine enclaves. It is obvious that the gender-related divisions among students reflect existing inequalities on the labour market. The young and much more educated generation is continuing to choose academic pathways leading to professions and occupations typical for their gender. One of the basic reasons for this is sex-role socialization.

Figure 2

Faculty feminization (departures from the 0.5 reference value)



Children observe division of responsibilities, ways of behaving or interests, first in their parents and then in various other institutions. Suffice it to mention schools which are full of female, not male, teachers. The media, another important link in the socialization process, also confirm our observation that traditional social role distinctions are well preserved. The combination of stereotypes and the tendency to spend time with people just like us (homophily) is partly responsible for the fact that men and women have little freedom of choice. It can be observed that women who are sufficiently competent in the exact sciences are more likely to choose courses leading to teaching (e.g. mathematics) than courses requiring the same level of ability at the entry examination but traditionally thought to be masculine domains (e.g., IT). It looks like these differences prevail despite equal access to higher education.

Chances of Choice of Field of Study

The foregoing review leads to the conclusion that there are several patterns of selection to various fields of study, both gender-related and background-related. Let us now look at these determinants in terms of probability. Our analysis will be based on the results of a multinominal logistic regression (MLR) model presented in Table 4 and Table 5.[7] The variable "educational homogamy" means that both father and mother have higher education. The size of a student's place of origin can assume two values: "small" with from under a thousand to 100 thousand inhabitants and "large" with over 100 thousand inhabitants. The variables to be explained are the chances of studying at one of two colleges, polytechnic or medical university, and university is the referential category. The second model explains the chances of studying a given profile. Categories of the fields of study were composed by combining 35 subjects according to content similarity. I have distinguished the following profiles: technical (engineering sciences), natural and life sciences (biology, chemistry, lower-level medical studies), economical (economics, management), humanities and social studies and, due to their high prestige, law and medicine. The reference category with which I shall compare the profiles in the table is the humanities and social studies profile.

High parental background trebles the chances of choosing the MU rather than the U but insignificantly reduces the chances choosing the polytechnic. This confirms our earlier findings concerning the elite nature of the MU and the relative similarity of social background structure at the P and the U. This effect may be accounted for by the relative homogeneity of courses at the MU and the prestige which attracts upper-class candidates. The prevalence of students whose parents have higher education can also be seen in the fact that these students have a three times greater chance of choosing a prestigious field of study. Gender has a differential effect on choice of field at two

[7] Multinominal logistic regression is applied when the outcome variable is a nominal and has more than two categories. Parameters are estimated for n − 1 categories of the outcome variable, in this case 2 colleges. The third college is a referential category with which we compare the remaining two colleges. We must also remove one category from the list of independent variables. The tables present those exp(b) coefficient values for which values higher than 1 are interpreted as more probable, and values lower than 1 are interpreted as less probable vis-à-vis the referential category.

Table 4

The chances of studying at the Polytechnic or Medical University compared with the University: exp(b) coefficients obtained using the MLR model

	Polytechnic	Medical University
Men versus women	4.337*	1.243
Small versus large place of origin	1.143	1.339
Parental educational homogamy	0.937	3.021*

Nagelkerke $R^2 = 0.146$; * $p < 0.05$.

Table 5

Determinants of choice of field of study: exp(b) coefficients obtained using the MLR model

	Technical	Natural	Economic	Prestigious
Compared with the humanities and social studies				
Men versus women	7.9*	1.7*	2.8*	3.1*
Small versus large place of origin	1.1	1.2	0.6*	1.1
Parental educational homogamy	1.6	1.2	0.6	3.2*

Nagelkerke $R^2 = 0.153$; * $p < 0.05$.

different points of the decision making process. It determines choice of college and choice of profile. Being male increased fourfold the chance of choosing P rather than U, and choosing a technical, natural science, economic, or prestigious course rather than a humanistic-social course. The size of place of origin had no significant effects except that it significantly reduced the chances of studying an economic profile. The specific regional structure may be responsible for this result. Many Białystok students come from smaller nearby towns. The effects of this variable may well have been different had the analysis been conducted in larger academic centres.

Conclusion

In this paper I've focused on horizontal inequality in tertiary education from the perspective of relation between field of study on the one hand and social background and gender on the other hand. Some results confirm the common intuitions: most upper-class students choose prestigious fields of study. Their background resources which allow them to access the higher education successfully are also utilized when choosing the most attractive majors. This conclusion supplements Mare's hypothesis: despite the relative reduction of selection when crossing the threshold between high school and college, social background continues to segregate men and women who have chosen to continue their education. The second evident result is the over-representation of men at exact sciences, technical faculties and the over-representation of women at faculties traditionally associated with the feminine role. This outcome may be attributed to socialization to gender roles and the influence of institutions which make

subtle but inseparable connections between gender and aspirations. However, the third aspect of background-related segregation which we tested, based on cultural capital theory, was not confirmed in the present study. We found significant differences in background structure within the humanistic curricula. For example, there is a great distance between students of education and law. The group of subjects requiring linguistic proficiency has a hierarchy of its own, topped by law. In our case, the humanistic and exact sciences, social and natural fields all had similar background structure, the only exception being the most prestigious faculties. Perhaps this can be attributed to the recent increase in number of students or to better adjustment to capitalism where specific competencies learned at non-humanistic faculties count most. Whatever the reason, upper-class students prefer subjects which have traditionally guaranteed high status to subjects which provide social expertise whereas humanistic studies are no different from the exact sciences as far as background segregation is concerned. More thorough analyses revealed a relation between risk-proneness, social background and choice of field of study. Students studying prestigious subjects are more risk-prone than students studying all other subjects but this relation is not very strong. The relation between background and college type was stronger. Viewed in a broader context, these findings illustrate the mechanism of social reproduction. Upper-class students tend to select the most prestigious fields and it does not matter whether their goal is to achieve the highest possible level of education or the best possible one. The mechanism of status inheritance is effective despite the dramatic increase in enrolment rates. The expansion of higher education among young Poles has led to a reduction of the distributive dimension of inequality but it has exposed other inequalities which were less prominent in the past. Inequality is a permanent aspect of social structure and no matter what changes take place in society at large, they will continue to determine individual achievement.

The validity of the present results may raise some questions. We know from earlier research that the pattern of background selection to various fields of study is similar across different countries. The most important conclusions from Białystok study are partly corroborated by the findings of a PGSS (Polish General Social Survey). Although the indicators are not fully equivalent, they do allow us to observe similar patterns among students. Of all the Polish women with higher education, 71% have diplomas from humanistic colleges and one in five completed a technical profile. Background-related differences also follow a similar pattern to the one which emerged in the present study. The proportion of medical university graduates is highest among individuals whose parents both have higher education.

On the other hand, there are many uncontrolled sources of variance which may have affected the results of our analyses, such as: college prestige (at more prestigious colleges background selection at entry may be stricter and background differences between faculties may be weaker than at less prestigious colleges) or the structure of fields of study and faculties (the distinction between applied and non-applied fields is particularly important). All these factors may affect a field's place in the social background and gender hierarchy. Further research (especially in other academic centres) is needed for more detailed insight into class selection in higher education.

Table 6

Proportions of women studying the four profiles and proportions of students whose parents both have higher education (percents)

	Proportion of women	Proportion of upper-class students
Polytechnic	22.1	8.1
Economical	65.8	5.6
Medical	60.9	13.0
Humanistic	71.6	6.0

Source: PGSS database 1997–2005. The variable is a combination of responses to the following question: "What sorts of diplomas and professional or academic titles did you receive on completion of your studies at this school (college)?" Only individuals with higher education were included.
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