

Gendered Educational Paths of Polish Youth.

Causes and Consequences.

Renata Siemieńska

Warsaw University

Introduction

In this paper, we will mainly discuss the relationship between exam results of girls and boys in junior high schools and their life aspirations as well as role of cultural and social factors which influence their choices.

After change of political system in 1989, in the new conditions of free market economy, demand for education increased. New educational institutions are being established and the number of students is systematically growing.

In 1999 the change in the structure of schooling system took place. The actual structure is as follow: obligatory 6 year primary school and 3 year junior high school, and as next, non – compulsory 3 year high school. Also, another change has taken place in the last years. Less children are being born, so the absolute number of children attending schools is decreasing (Demographical Yearbook, GUS 2004, p. 56).

The text is mainly based on published and unpublished data of the Central Statistical Office, and analyses conducted by the author within the framework of study conducted by Center of Study of Public Opinion and Market – Pentor on determinants of results of junior high school exams and their consequences.

Level of education of the Poles

Since the beginning of the nineties of the 20th century, the level of education of the society has been rising very quickly (Table 1). Incomplete elementary education (or no education at all) has become a rarely observed phenomenon. According to the data from 2003, in cities, regardless of their size, the percentage of persons with such education does not exceed 2%, and in the rural areas – about 4.5%. The percentage of women among these is very slightly higher than that of men. The percentage of persons with only elementary education, completed general secondary education, postsecondary or university education and who have obtained the M.A. degree is higher among women than among men. Among women, the group of those, who have completed basic vocational education, secondary vocational education, a bachelor degree and doctoral studies is lower than among men.

Specification	1988				1995				2002			
	Total in thousan ds	% T	% W	% M	Total in thousan ds	% T	% W	% M	Total in thousan ds	% T	% W	% M
Grand total	28269**	100, 0	100, 0	100, 0	29881**	100, 0	100, 0	100, 0	32435	100, 0	100, 0	100, 0
Tertiary	1838	6,5	5,9	7,2	2041	6,8	6,4	7,3	3204	10,2	10,4	9,3
Post-secondary	469	1,6	n/a	n/a	763	2,6	3,9	1,1	1024	3,3	4,6	1,6
Secondary, total	6980	24,7	28,4	20,6	7350	24,6	27,5	21,5	9185	29,4	30,4	26,0
Secondary vocational	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6383	20,4	18,7	20,6
Secondary general	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2802	9,0	11,7	5,4
Basic vocational	6666	23,6	16,3	31,5	7742	25,9	18,6	33,9	7540	24,1	16,9	30,1
Primary	10961	38,8	41,5	35,8	10058	33,7	35,8	31,3	9652	28,1	31,4	28,0
Incomplete primary and without school education	1721	6,1	7,5	4,5	1893	6,3	7,7	4,8	1180	2,8	4,3	3,0
Unknown educational level	102	0,4	n/a	n/a	n/a	n/a	n/a	n/a	652	2,1	2,0	2,0

Table 1. Polish population* aged 15 or more according to education level in years 1988-2002 (N, %)

* For 1988, data of the National Census, concerns the population aged 15 and more; for 2002, data of the Population and Housing Census,

** Further division does not take into account persons with unknown educational level.

Source: 1988 – GUS, Rocznik Statystyczny 1991, page 44; 1995 – GUS, Rocznik Statystyczny 1997, page 97; 2002 – GUS, Rocznik Statystyczny Rzeczypospolitej Polskiej, Warszawa 2004, page 196.

Educational paths of children and youth (primary schools, junior high schools, secondary schools)

The present structure of education is a result of the diversified concepts of life paths

selected by girls and boys, which have been present for years (Białycki 1997). Since the vocations that could be obtained at vocational schools were considered as appropriate for men, many girls have been enrolled at general education secondary schools. In the period of the political and economic transformation liquidation of many industrial plants was associated with closing by the Minister of Education of the affiliated basic vocational schools, as well as many other schools, due to changes in the profile of economy, and the devised educational reform. In the situation, boys, who graduate from primary schools (and now also junior high schools), increasingly often continue their education at general education secondary schools. Therefore, in the recent years, girls have constituted a decreasing percentage of general education and vocational secondary schools in comparison with the previous period (although the absolute number of girls is not lower). In year 2004/5, they constituted 60% of general education secondary school students (in 1990 – 73%) and less than half of all students of vocational secondary schools (in 1990/1 – 52%) (Fig. 1).

Figure 1. Students at general education secondary* schools and vocational secondary* schools in years 1990 – 2004** according to gender (%)

* Until academic year 2001/2 – postprimary, from 2002/3 – including postgrammar schools.

** In the academic year 2004/5, the proportions of male and female students of general education secondary schools for children and youth were identical as in year 2003/4.

Source: Oświata i wychowanie w roku szkolnym 2003/2004, Warsaw: GUS 2004, p. 4, own calculations

In the recent years, the differentiation of choices with regard to educational paths between the children from cities and from the rural areas has been decreasing, as well as those between girls and boys in the rural areas and in the cities.

At the basic vocational schools (3 year schools) the girls are focusing mostly on schools offering education in the fields of medicine, economy and administration, as well as the sector of services. They are practically absent from schools that offer curricula in engineering and technology, architecture and construction. At secondary vocational schools (4 year schools) girls very rarely select schools offering IT education, although the qualifications offered by them are valued highly on the labor market. The boys are equally reluctant to study fields considered to be feminized.

Results obtained by the Polish youth in age 15 in the survey of knowledge and skills of students in the international research project PISA 2003 conducted on representative random sample show that students' „inclination to select more innovative and less mechanical strategies depends on individual qualities of a

student, in the first place, the status of the parents and gender ... [B]oys display a less mechanical approach than girls and are more eager to search for new methods to reach the solution (a difference of 10 percentage points)" (Romaniuk, *PISA 2003*, the Polish report). „In Poland, in the entire population of students, no difference between the results of girls and boys was found, but ...at the task level.... Boys more often than girls received full scores for their answers, and girls more often received partial scores" (Ostrowska, *PISA 2003*, the Polish report). "... the results indicating the highest level of thinking in natural science was obtained by 18.1% boys ... 14.7% girls" (Ostrowska, *PISA 2003*, the Polish report, p. 22).

A nationwide research project on factors differentiating school marks at the level of grade 6 of primary and grade 1 of junior high school, conducted in Poland in 2001, show also that the economic and social background and the student's gender are the most important factors. "Girls get better marks than boys, and this difference becomes even more significant at the junior high school. Its growth is probably a result of a different response to the increased pressure exerted on the students at school: boys, more often than girls, react with resistance to such change, which influences their marks negatively" (Konarzewski 2000, p. 40). The quoted research conclusions may suggest also that the worse results obtained by girls in PISA project are an effect of the school curricula and methods applied, which the girls are unable to defy. Experiments (Wieczorkowska-Nejtardt 1997) aimed at lowering the level of fear of solving mathematical problems among girls, show that the differences in results between girls and boys decreased and were small when girls did not perceive the problems as difficult.

Socio-cultural factors influencing the exam results of boys and girls graduating from junior high school and their occupational plans (research conducted in 2006)

The research project, conducted by Pentor encompassed 94 schools drawn simply from 6 levels generated on the basis of the following criteria: (1) School location – city and village, (2) Classification accordance to the average result of the school, obtained during the external exams in the school year 2004/2005 within three groups: the best schools – above average, average and poor – below the average. Such method of selection of schools, although it is not representative, ensures that the sample will contain schools that have obtained varying results, which will allow for a precise analysis of conditions and ability to make comparisons between the urban and rural areas. In each of the schools drawn, among all students of grades subjected to the exam, 20 students were drawn using a simple method to participate in the research. Unfortunately, it was not possible to conduct all of the planned interviews at all schools. 1551 questionnaires were filled out by students (auditorium

questionnaire), and 1761 questionnaires were filled out by parents of students participating in the research project (the questionnaires to be filled out was handed over to them by students).

The role of the „cultural capital” of the family

In our research, boys obtained slightly better results in mathematics and natural sciences, while girls obtained much better results in the humanities.

In the part of the test concerning humanities, children, who have both parents with university education or higher university degrees (doctorate, Ph. D.) obtained much better results than the average for the entire population. Slightly better results are obtained by children from families with at least postsecondary education, but no completed university education. Worse results are obtained by children, whose both parents have primary education or have not completed primary education. In the part of the test concerning mathematics and natural sciences, the advantage of children coming from families with both parents having university education is even greater. The second place in this regard is occupied by those children, whose both parents have secondary education. Thus the analyses show the significance of the „cultural capital” at home (as it has been defined by Bourdieu (Bourdieu, Passeron 2002)). The level of education of the parents does not only indicate greater knowledge, but – as it has been shown by our analyses, presented in the further part of the paper – also different lifestyles and aspirations.

Professional activity of mothers and fathers analyzed separately is strongly correlated with the results of both parts of the test for both girls and boys. Children, who have working mothers and/or fathers constitute more than a half (58%) of the students who attain the best results (39-50 points) and only more than one-third among those, who have the worst results. The percentages of girls and boys, whose mothers are professionally active among those obtaining the best results in humanities, are the same (58% and 58%), and for the mathematics and natural sciences, they are even higher (52% boys and 60 % girls). A similar correlation can be observed between employment of the fathers at private or state companies and the results obtained by their daughters and sons – their offspring constitutes a larger group among those, who obtained the best results, than among those, who obtained worse results.

Children, in particular sons, of the parents who are farmers constitute the majority of those obtaining the worst and relatively worse results. They constitute only about 10% of those obtaining the best results. It is necessary to remember, too, that a large part of farmers are persons with only primary education. A situation, in which the mother takes care of the house and does not work, is correlated with worse results of the children, particularly girls, for both parts of the test. Children of the unemployed attain low and average results, and very rarely are they found in the group obtaining

the best results (Fig. 2).

Figure 2. What is the present occupation of your mother (guardian) and your father (guardian)? Math and natural science (%)

Household equipment

The percentage of students, who do not have computers at home, is the highest among those students, who obtain the poorest results (in humanities, less than 24 points, and in math and natural science – less than 15 points). Those obtaining the lowest results also found it more difficult to get access to a computer, which they could use to study, than the best students (66% and 90% respectively), as well as the Internet (36% and 66% respectively), educational computer programs (53% and 72% respectively). It is peculiar that in all groups, differentiated according to the results obtained during the tests, girls had more difficulties with getting such access than boys (the differences sometimes exceeded ten percentage points).

This result could be interpreted in two ways: (1) parents invest less in the girls, (2) girls come from poorer families, thus having less financial resources for investments of this type, but they work harder to get the best possible results. Although the two situations may coexist, lesser investment in education of girls seems to play a more significant role, since it can be observed in all groups of results obtained during the exam. This lack of access of girls to computers, software, the Internet surely influences their views of their further educational paths and selection of occupation.

Possession of specific books is a statistically significant differentiating factor, influencing the results obtained by girls in the tests as regression analysis shows. Unlike in the case of access to computers, the Internet and computer software, girls have better access to classical literature, encyclopedias and dictionaries than boys in individual groups according to test results.

Role of the family and school in solving learning problems

Research conducted in 1996 (Siemieńska 1996) showed that the mother in the first place, and then the father, played the most crucial role as companions for the youth to discuss politics, plans for the future, personal affairs, studying or work. Teachers played a less significant role than the parents or peers. The research discussed here, conducted using a different sample (junior high school students only), and responses to a question formulated in a different manner: „When you have problems with learning, whom do you ask for help in the first (and second) place?”, show that both boys and girls most often, and to the same extent, are eager to ask assistance of a teacher of a given subject (in total, 45% of all students provided this response as the first or the second one). In case of the poorest students, the class tutor is on the second place - listed by 29% of students, who obtained up to 15 points. Among those, who achieved the best results, it was mother, father, siblings, friends. The class tutor occupies a much lower position here and he or she is listed by 10% of students belonging to this group. The above results show yet again the role of the

family as the “cultural capital” of the children, obtained at home, and the limited role of the school as a factor equalizing insufficiencies in the less educated communities. There is no correlation between the child’s gender and the fact of requesting assistance from specific persons.

A role model among the family members

The population of students is divided into two groups of similar sizes of those, who believe that there are role models in their families (45%) and those, who do not see them (45%) – for the rest, the results are not available. The best students in humanities (46% of this group) more often than the worst ones (33%), girls slightly more often than boys, pointed out role models in their families. When it comes to the test in math and natural sciences, the respective values were 45% and 41%. Also in this case girls more often pointed out the role models existing in their families than boys. The differences between girls and boys amounted to several percentage points in individual groups based on the results of the tests.

The person most often indicated to be a role model is the mother (33% of all responses), then the father – much less often (18%). In order – both parents, sister (5%), brother (4%), uncle, grandfather (3% each), aunt, grandmother (2% each). As it could have been presumed, boys more often pointed to the father as a role model, and girls were more eager to admire their mothers – both among the best and the worst students. Those, who obtained the best test results, slightly more often pointed to the mother. The percentages of those pointing to their fathers were the same in all groups classified in accordance with the results of the test in humanities, and their number was slightly greater in the case of the test in math and natural sciences.

Family members are perceived as role models more often than persons known to the students from TV and other media. Only 19% of students perceived them as role models; 64% did not. No data was available for 18%. Celebrities were named rather by worst students. In total, 24 Polish men and 13 Polish women were listed; men were perceived as role models by boys, and women – by girls. These were mainly politicians, who are currently active on the political stage, as well as actors and actresses, TV show hosts. Among the foreigners – mainly actors and actresses, politicians and sportsmen. The latter were more often indicated by boys.

Summing up, it can be said that the family still plays an important role in setting models. The parents serve as frames of reference for a large group of students, especially those, who attain better results. Similar results have been obtained e.g. during research conducted in 1995 (Siemińska 1998).

Selection of future education paths by students and their parents

Almost a half (46%) of the examined students plan to study at a general education secondary school. The next places are occupied by those planning to enroll at

technical high schools (29%), specialized secondary schools (11%), basic vocational schools (9%). Five (less than one percent) do not plan to get further education. There is only a small group of those not knowing what to do (1%). In case of 3%, data is not available.

The type of school selected is one of the most significant variables, which is statistically significant in regression analyses pertaining to predictors of test results (in fact, it is a feedback mechanism), conducted separately for subpopulations of boys and girls.

Figure 3. Educational aspirations of male students of junior high school with the worst exam results in math-natural science part and their parents' aspirations concerning boys' education (%)

Figure 4. Educational aspirations of male students of junior high school with the best exam results in math-natural science part and their parents' aspirations concerning boys' education (%)

Figure 5. Educational aspirations of female students of junior high school with the worst exam results in math-natural science part and their parents' aspirations concerning girls' education 2006 (%)

Figure 6. Educational aspirations of female students of junior high school with the best exam results in math-natural science part and their parents' aspirations concerning girls' education 2006 (%)

In general, students obtaining poorer results associate their plans with basic vocational schools and technical high schools. A significant part of boys, who obtain good results in both parts of the test, also go to technical high schools. Girls mostly go to general education secondary schools, not only those with good and very good results in the junior high school tests, but also a large part of those having poorer results. Thus the regularity, which has been observed for many years, of different educational paths of boys and girls has been maintained, despite the education reform implemented in 1999 (Fig. 3-6).

The number of boys choosing basic vocational schools is decreasing, which is

largely due to the diminishing number of these schools. Accordingly with the tendency observed since the beginning of the nineties of the last century, a large and increasing number of children, as well as their parents, prefer them to obtain university and not secondary education (CBOS 1996, 2004), and this trend is only slightly influenced by the age and level of education of the respondents (Siemieńska 2006). Only among the worst students, 22% of boys and 17% girls believe they will finish their education at the level of basic vocational schools. Among children having obtained better results in the tests, these are only very rare cases. In general, boys more often plan to finish their education at the secondary level than girls. Among those planning further studies, the number of girls is greater and the higher the level of education planned, the greater is the advantage of girls thinking they would be able to attain it. Male and female students, who obtained better or the best results in the test for math and natural sciences, more often believe they will obtain M.A. degree, and they expect to get higher academic degrees than those, who have obtained the equivalent results in humanities. In total, 28% does not expect to get more than secondary education. On the other hand, among the rest, the largest group consists of those, who plan to complete M.A. studies or a degree in medicine (25%), to finish doctoral studies or get a higher academic degree (19%). The intention to finish doctoral studies or get a higher degree is declared equally often by students, who have obtained good and weak test results, which may be a result of the growing conviction of inflation of diplomas, as well as of the need to raise qualifications further. It may also indicate that junior high school students are not familiar with the conditions of obtaining the subsequent degrees. Bachelor degree or engineer degree studies, which, in accordance with the reforms of university level education being conducted (Bologne process), are to be the target level of education for a significant part of the youth, is in fact perceived by only a small number of students as being their final education level (10%).

Almost all of the examined junior high school students are convinced that they will be able to achieve their educational objectives “for sure” (40%) or “rather” (41%) – girls and boys to a similar extent. On the other hand, boys are more often convinced of their ability to achieve their objectives associated with professional career. The difficulties perceived are first of all financial problems (18% of all students), large competition on the labor market (9%), the problem of getting access to the preferred university faculty (5%). Paradoxically, all of these were listed relatively most often by those students, who obtained good or very good results in the tests, girls more often than boys. Nevertheless, there is a correlation between the students’ beliefs with regard to their ability to achieve their educational objectives and their career objectives (Pearson’s correlation 0,446, p<0,000).

Professional career plans of junior high school students

The most often selected careers are associated with new technologies (IT and

telecommunication) (8% students), work in the hotel industry (5%), unqualified workers in technical and construction industries (5%), doctor, lawyer, office worker (4% each). Since the question was an open-ended one, several dozen professions were listed. The analysis shows that the youth are trying to pick those professions, which are now regarded as giving them the opportunity to get jobs in Poland and abroad. At the same time, the division into male and female professions still exists. Girls rarely think about IT and telecommunication, regardless of the results obtained in the math and natural sciences test. Those, who got the poorest results, do not plan to work in this sector, but among the best students, 13% would like to get employment in the field; among boys in the group 27%, and among girls – 1%. In the hotel industry, the proportions are equal. Boys, who obtained poor results, plan to become unqualified workers. Career of doctor, lawyer, teacher, office worker is mainly planned by male and female students with the best results in the math and natural sciences test; more often by the girls. Only less than 1% of students declare they would like to become scientists in the future, despite that many research projects have shown that university professors are on the top of the list of those enjoying the greatest prestige, and also despite the fact that many students want to get university education and attain higher academic degrees. It shows that the most important criterion for selection of career path is the ability to get a good or a relatively good remuneration. At the same time, we know that obtaining a doctoral degree makes it easier to get a job associated with positions requiring a high level of qualifications in the economic sector, and on the greatly competitive labor market, having a doctorate (as “something more”) may increase chances for success. Although a large percentage of the population is still employed in farming, almost nobody wants to work in agriculture in the future. 31% of students, boys more often than girls, do not know the profession they would like to have in the future (when they are about 30). In particular, the worst students responded „I don’t know” or simply failed to answer this question.

There is a correlation between the educational plans of the children and the views of their parents concerning their education (on the basis of questionnaires addressed to students and their parents). The parents want their children to attain the same social position or higher than they have. There is a statistically significant correlation between the level of education of the mother (Pearson’s correlation 0,284, $p<0,000$) and the educational aspirations of the students (question: “How do you think, what level of education will you attain?”), just like between the level of education of the father (Pearson’s correlation 0,235, $p<0,000$) and educational aspirations of the students.

Female and male students in higher education institutions

The new economic situation has led to enrolment of a greater number of students at

state universities, as well as establishment of new, private universities, which enabled a significant increase in the number of university students in the nineties. In the period 1990-2005, the number of female students increased fivefold and that of male students – fourfold. Full time and extramural studies are the basic types of university education. Already in 1990, women constituted more than half of all students of all type, except for full time studies. However, in 2003 – they consisted 55% of students of this type. More often than men, they select different types of education (for instance, shorter curricula), which are generally perceived as providing less thorough preparation for professional work, and they enroll at schools, which offer a narrower scope of professions. Despite the significant changes in numbers, the structure of enrolment according to gender has not changed in comparison with the previous period (Białycki 1997). Women select cheaper studies, taking into account not only the tuition fees, but also the total costs associated with studying and staying in large cities. Since the early nineties, the percentage of women among extramural students, external and evening students has been increasing, especially at the private universities, where the educational level is usually lower.

Lack of any uniform classification of groups of study fields for years 1960-2005 makes any direct comparison impossible. Nevertheless, it can be surely stated that fields classified as technical and associated with transport services are still strongly masculinized. Among these, there is also the relatively new IT science. Pedagogy and humanities have retained their feminized character, and the percentage of women here has been maintained at a constant level (above 70%). The number of women studying fields associated with business, administration and services has increased significantly. In academic year 2004/5, at most faculties of this kind, women constituted half or much more than a half of the total number of students.

Fields of education	Total		
	total	Men	Women
Total	100	44	56
Education science and teacher training	13	29	71
Humanities	8	29	71
Arts	1	36	64
Social and behavioral science	14	35	65
Business and administration	26	38	62
Law	3	47	53
Journalism and information	1	29	71
Life science*	1	19	81
Physical science**	2	44	56
Mathematics and statistics	1	37	63

Computing	5	87	13
Health	4	23	77
Social services	0	16	84
Engineering and engineering trades	8	82	18
Manufacturing and building	1	52	48
Architecture and building	3	63	37
Agriculture, forestry and fishery	2	47	53
Veterinary	0	35	65
Personal services	3	37	63
Environmental protection	3	48	52
Transport services	1	86	14
Security services	0	73	27

Table 2: Students of higher education institutions by fields of education and gender in 2004/2005 (%)

Source: GUS, unpublished data for school year 2004/5.

* Life science includes biology, botany, biochemistry, toxicology, genetics, zoology.

** Physical science includes astronomy, physics, chemistry, geology.

In yellow – feminized fields, in green – masculinized fields.

Women constitute a majority of graduates of M.A., doctor of medicine or equivalent studies. The number of women with engineering diplomas is much lower than that of men.

In the past, women much less often enrolled at doctoral studies and/or earned their Ph.D. degree. In years 1995-2003, the number of doctoral students increased three times. The number of women increased by 10%, so in year 2003 they constituted about one half of all doctoral students. The increase in the number of these students may be explained by influence of several factors (Siemieńska 2006). Undoubtedly, an acceptance of larger number students is a response of universities to the increased demand for doctoral studies as giving higher chances for getting a better job more than university studies of lower level. An increase of the number of women among the doctoral students shows also that apart from the reasons for increased demand for doctoral studies, attaining of higher academic degrees is perceived less and less – both by female graduates and by the recruiting universities – as a career proper only for men. In 2003, women constitute almost half of all graduates of doctoral studies. Some are still strongly feminized – these include humanities, pharmaceutics, chemistry; others remain strongly masculinized, such as technical sciences, mathematics.

Figure 7. Doctoral degrees granted in years 1980-2003 according to gender

Source: 1980 – data of the Ministry of Science, University Education and Technology;

1985 – data of the Ministry of Science and University Education;

1990 – data of the Center for Scientific, Technological and Economic Information;

1991–2002 – data of the Center for Processing of Information.

as in: Nauka i technika w 2002 roku, Warsaw: GUS 2004, p. 190;

2003 – Szkoły wyższe i ich finanse w 2003 roku, Warsaw: GUS 2004, p. 79.

Summary

The exam results in humanities and mathematics of junior high school students are highly correlated with a cultural capital of their families.

Despite that in the period after year 1990 has been characterized by a dynamic increase in the level of education of the Polish society, especially among women, there has been no significant change in the structure of fields selected by women and men on all level of education. A reason for concern may be the fact that girls and boys at the age of 15 select the traditionally “female” or “male” professions regardless of the results obtained by them in tests on math and natural sciences, which means that in the future, we will be facing a further deficit of women in such fields as new technologies or engineering studies.

REFERENCES

- Białecki, J. (1997), Dwa cele kształcenia. *Polityka Społeczna*. nr 4. Warszawa.
- Bourdieu, P., Passeron, J-C. (1970). *La Reproduction*. Paris, Les éditions de Minuit.
- CBOS (1996). Aktualne problemy i wydarzenia (72) – maj 1996. Warszawa.
- CBOS (2004) Aktualne problemy i wydarzenia (167) – kwiecień 2004. Warszawa.
- GUS (2004). *Demographical Yearbook*. Warszawa.
- Fedorowicz, M. (2004). Badanie PISA i jego rezultaty (PISA Study and Its results). In: *PISA 2003, Polish report*.
- Konarzewski, K. (2000). Gimnazjum po dwóch latach – zamierzenia i wyniki (Junior high school after two years – plans and results). In: *Zmiany w systemie oświaty*. Warszawa: ISP, 23-84.

- Ostrowska, B. (2004). „Rozwiązywanie problemów” w programie PISA (Solving Problems in PISA Programme). In: *PISA 2003, Polish report*.
- Romaniuk, A. (2004). Uczenie się matematyki: Motywacje i strategie uczniów (Learning Mathematics: Pupils' Motives and Strategies). In: *PISA 2003, the Polish report*.
- Siemieńska, R. (1998). The Role of Family and School in Socialization in a Changing Polish Society. In: B. Wellie & K. Hufer (Eds.), *Sozialwissenschaftliche und bildungstheoretische Reflexionen*. Berlin – Cambridge/Massachusetts: Galda+Wilch Verlag, 283-300.
- Siemieńska, R. (2006). Polish Universities as a Place of Study and Academic Careers: Class and Gender Consideration. In: W. R. Allen, et al. (Eds.), *Higher Education in a Global Society: Achieving Diversity, Equity and Excellence*. Amsterdam – Boston – Oxford –Paris – Sydney – Tokio: Elsvier, 51-90.
- Wieczorkowska-Nejtardt, G. (1997). Czy kobiety czują się gorsze od mężczyzn w matematyce? (Do women feel worse than men in mathematics?) In: R. Siemieńska (Ed.), *Portrety kobiet i mężczyzn w środkach masowego przekazu i podręcznikach szkolnych. (Portraits of Women and Men in Mass Media and School Textbooks)*. Warszawa: Wydawnictwo Naukowe „Scholar”.