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Decoding of academic content by first grade students

Kamil Błaszczyński

University of Wrocław, Faculty of Social Sciences
ul. Koszarowa 3, 51-149 Wrocław, Poland
Email address: kamil.b.1988@wp.pl

Jacek Gulanowski

Faculty of Pedagogy, University of Wrocław
ul. J.Wł. Dawida 1, 50-527 Wrocław, Poland
E-mail address: jacek.gulanowski@gmail.com

Grzegorz Kozdraś

University of Wrocław, Faculty of Social Sciences
Ul. Koszarowa 3, 51-149 Wrocław, Poland
Email address: grzegorz.kozdras@uwr.edu.pl

Abstract

In the paper a comparative study conducted on the 1st grade students of sociology and pedagogy is discussed. The study focused on the language skills of students. The abilities to decode academic content are the most important tested skills. The study shows that the students have very poor language skills in decoding the academic content on every level of its complexity. They also have noticeable problems with the definition of basic academic terms. The significance of the obtained results is considerable because of the innovative topic and character of the study, which is the first such study conducted on students of a Polish university. Results are also valuable for academic teachers who are interested in such problems as effective communication with students.

Key words: academic language, decoding, higher education, university, academic teaching

Introduction

The theory of cultural capital of Pierre Bourdieu assumes that language, as a sub-capital of cultural capital, is essential in decoding substantive and symbolic content in the symbolic field (Bourdieu, 1999). The symbolic field is located in a specific time and space (Bourdieu, 1969). One such space is academic culture. Thus, language as a sub-cultural capital is crucial in the correct understanding of academic culture.

The ability to understand academic content from the perspective of the theory of social stratification seems to be important, because with this capability, students are able to understand (better or worse) academic content, which is transmitted to them (Bourdieu, & Passeron, 1999, pp. 205-223). These contents are in present times knowledge of specialists and are used by individuals in the course of social interaction on both social and professional level. Lack of high competence in decoding of academic content, may result firstly in the short term marginalisation of some students during the process of academic education. Also in the long term, it may cause lower quality of preparation in the use of specialised knowledge and skills. This study is inspired by issues of research undertaken earlier by Pierre Bourdieu and Jean Claude Passeron (Bourdieu, & Passeron, 1999, pp. 205-223), whose long-term studies showed that the educational success of children (in France), at every stage of education, depends on the quality of use of the language, most widely used among the wealthier strata of society.

The study of this problem is currently continued in the Anglo-Saxon cultural circle. Most similar to the aforementioned study are works by Eli R. Johnson (2009; 2012). Her studies clearly point out the fact that knowledge of rules of the usage of the dominant language, in the education of the child (age 6-12 years), is reflected in the quality of educational content decoded by child itself. In Poland this thesis was put into practice by Małgorzata Żytko (2010), whose comprehensive study was aimed at the diagnosis of language competence of children of primary school age. In her study she connected language competencies of children with their performance at school. From the results it can be concluded that the relationship between the richness of vocabulary and knowledge of grammar rules and style of the Polish language translates to better functioning of children in Polish schools.

This result is not surprising, considering the fact that the form of the diagnostic tests, the scale of assessments and interpretations of the results was designed by school teachers. The tool of diagnosis that has been created refers to the psycho-somatic standards, adequate to the age and development of diagnosed children (in this case, 8-9 years of age).

This methodology would not be possible to transfer to the ground of academic education, because diagnostic tools, as well as standards of psycho-somatic development used in the M. Żytko study, are not suited to the conditions of students of the first year of higher education. Because there is lack (or even absence) of such studies in Poland, this study has a high exploration value. The proposed study fills the gap about the subject phenomenon in Poland. Inspired by French and Anglo-Saxon studies, it was a pioneer research in Poland, indicating the importance of understanding and interpreting the role and function of the mother tongue in the process of academic education in Poland.

Research Problems

The main problem of the research discussed in this paper was: What kind of language competence in the field of understanding of the academic content do students of selected social science disciplines have? This main research problem was divided into specific ares:

- How effectively students of selected social sciences decode statements written in academic language?
- How effectively students of selected social sciences define academic terms?
- How many academic terms students of selected social sciences effectively decode?
- How many academic terms students of selected social sciences effectively define?
- How the effectiveness of decoding sentences and defining terms correlates with selected auxiliary variables (gender, age, education level of parents, size of place of residence) and academic elements of the educational process of students of selected social sciences (field of study with an average and the semester of the studies)?
- How the number of decoded sentences and defined terms correlates with selected auxiliary variables (gender, age, education level of parents, size of place of residence) and academic elements of the educational process of students selected social sciences (field of study with and the semester of studies)?

These research problems enabled formulation of a number of hypotheses:

- Age of students will positively correlate with the result obtained from the language test;
- Parents' education will positively correlate with the result obtained from the language test;
- The size of the place of residence will positively correlate with the result obtained from the language test;
- Type of studied faculty will positively correlate with the result obtained from the language test;
- Average semester grade will positively correlate with the result obtained from the language test.

Research Focus

In the process of first degree academic education (bachelor stage) the form of communication between the academic teachers and students is closed communication. It is a process focused on the absolute transmission of knowledge. In the perspective of freedom of interpretation of the content the recipient of the knowledge has very limited possibilities (Neckar-Irlicka, 2011, pp. 70-72). This condition is a consequence of structural and formal changes in the organisation and functioning of higher education, whose primary goal (in the first stage) is currently training future "job-working" staff (Rosalska, & Wawrzonek, 2011,

pp. 149-152). As a result, traditional relationship based on the model of master and student, disappeared and in its place new type of relationship - expert / specialist and customer - was introduced (Hejwosz, 2008; Sejdak, 2013). The difference between these types of relationships is essential. The first was aimed at the generational transfer of knowledge, values, and experience of the master to his disciples. The other is a standardised technological process provided by the university, with the constant scope for market services. In the second model, there can be observed the similarities to any other market transaction in which the customer (student) coming to the store (the university) expects the relevant services (a fair education in the particular field of knowledge). That type of relationship has two major consequences. The first is the high degree of public confidence in the institution of higher education in society, which according to John Domardzki are seen as a "school of specialists" (Domaradzki, 2009, pp. 18-19). The second consequence is the impoverishment process of academic education, in which students see themselves as passive recipients whose only necessity is to control the mindless packages provided by experts (Wawrzyniak-Baszterda, 2012, pp. 222-223). Thus, today's university is structurally lowering the creative and intellectual activity of students to a bare minimum (Kozyr-Kowalski, 2012, pp. 57-59). This is the logical consequence of the above-described process, which clearly constitutes a model of social relationship in which academic knowledge is produced and understand best by specialists with whom discussion on the reliability of ingested knowledge is considered nonsense, and therefore the credibility and transfer of acquired knowledge become total (Kozyr-Kowalski, 2012, pp. 105-106). The process of academic training for students is therefore only a process of decoding of the academic content, encoded and transmitted by academics in the form of written or spoken language communications.

Methodology of Research

General Background of Research

To properly diagnose language skills, it is necessary to include five individual capabilities responsible for effective use of language. These are in order: the phonological, morphological, syntactical, semantic and pragmatic ability (Bergmann, Hall, & Ross, 2007, pp. 8-10). These abilities taken together allow formation of the three language skills, such as understanding, interpretation and creation of acts of language. The aim of the study was to gain knowledge on how effectively students are able to decode/encode the academic content, and therefore how well they were linguistically prepared to carry out studies in their chosen field of social sciences.

Instruments and Procedures

A method of diagnostic survey, which consists of elements of language test has been used to test the language competence of students. A diagnostic survey was aimed at obtaining auxiliary data such as gender, age, place of resi-

dence (prior to the study), field of study, year of study, and the average semester grade gained by student. These data were correlated with results obtained from the language test filled out by students in order to check whether there were any social differences in the effective decoding of academic content.

Language test (entirely in Polish) was a questionnaire composed of two parts. The first part consisted of 30 sentences, written in academic language. The second part consisted of 30 academic terms that were used in the sentences of the first part of the test. The task of the students in the first part was to make paraphrases of the given sentences. The task in the second part was to create a brief definition of each of the terms. The test was divided into six point fields: 1) points obtained from paraphrasing the sentences, 2) points obtained from the definition of terms, 3) the sum of points obtained from defining and paraphrasing, 4) the number of positive paraphrased sentences, 5) the number of positively defined sentences, 6) the sum of positive and defined paraphrased sentences.

The created test was not accidental, because the ability to paraphrase sentences and define the terms involved all three language skills, thus understanding, interpretation, and creation of acts of language. Test was conducted under time pressure – the time limit was 45 minutes. Pilot studies conducted in order to verify the diagnostic utility of the tool showed that the time of 45 minutes was the maximum unit of time during which the students were able to concentrate on the task, not become distracted, or not give up the task of completing of the test. After the imposed time, the vast majority of the students were pushing themselves to the task of filling the test, or did not want to perform the action any longer.

After the gathering of the raw data, the questionnaires were judged by two independent, competent judges (one from the field of pedagogy and one from the field of sociology). The judges evaluated each paraphrased sentence and defined term on a three point evaluation scale (0 points awarded for no definition or paraphrase and wrong definition or paraphrase, 1 point awarded for partly correct definition or paraphrase, 2 points awarded for correct definition or paraphrase). In total, students could score up to 120 points on the test (60 in Part I and 60 in Part II).

The sentences and terms created for the purpose of diagnosis of language competences have been designed in favour of students of sociology at the expense of the students of pedagogy. It has been achieved through the implementation to the sentences, more specialist terms of the scientific language of sociology. This allowed researchers to formulate another hypothesis that students of sociology will achieve higher scores than students of pedagogy.

Research Sample

As one of the aims of the study was to check how well students are linguistically prepared to undertake social studies, the study included only first year students from two social science disciplines: Pedagogy (n = 97) and

Sociology (n = 98) from the University of Wroclaw. The students were at the end of their first year of study, thus it has been assumed that some basic vocabulary had been already acquired. Also it was interesting to check how well (in a qualitative manner) the students were acquiring scientific vocabulary. Selection of the disciplines the students which were studied was intentional because essentially pedagogy and sociology have common scientific terminology. A common set of terms and scientific words gave the opportunity to create a standardised diagnostic tool for two different courses of study. Possibility to compare the results between mentioned groups was interesting from a didactical and social point of view. Authors of this study, as members of the pedagogical and sociological academic staff, were concerned about the results of this study as both teachers and scientists. Because the higher scores of one of those groups could indicate that one of the mentioned courses is recruiting more valuable students. Also, one of the courses might have turned out to be more intensive in terms of language academic training. This matter was interesting for the academic staff of the compared disciplines, because the results can be used to improve future recruiting and education processes.

Selection of the students for the study was also based on two main criteria: year of studies and agreement to participate in the language test.

Data Analysis

The study was conducted in May-June 2015. The date had been chosen on purpose, because the study was focused on the problem of how well the students are decoding the academic language. Academia is a specific type of social environment, thus the university is a specific type of institution. It has been assumed that the students, inducted into the high school model of education, will need time to mobilise their gathered knowledge to adapt to the new educational conditions. Conducting the study immediately at the beginning of the 1st semester would create a very big disadvantage for the students not re-socialised to the new conditions.

The research group on which the study was conducted, consisted of two main research sub-groups (Table 1). During the study data from 195 students was collected, 97 (49.7%) of the students represented pedagogy as a field of study. The rest 98 (50.3%) students represented sociology.

Table 1

Research group from the perspective of the field of study

	Quantity	%	% Acknowledge	% Cumulative
Pedagogy	97	49.7	49.7	49.7
Sociology	98	50.3	50.3	100.0
Summary	195	100.0	100.0	

The research group was not homogenous in terms of age. The differences between the particular students varied as much as 7 years. Although the majority (82.6%) of the students were 20-21 years old, which is interesting, because there is a general attitude that the first year students in Poland are generally people who are 19 years old who have just graduated high school.

Table 2A

Research group in the perspective of age of the students

	Frequency	%	% Acknowledged	% Cumulative
1990.00	2	1.0	1.0	1.0
1991.00	4	2.1	2.1	3.1
1992.00	5	2.6	2.6	5.6
1993.00	20	10.3	10.3	15.9
1994.00	77	39.5	39.5	55.4
1995.00	84	43.1	43.1	98.5
1996.00	2	1.0	1.0	99.5
1997.00	1	.5	.5	100.0
Summary	195	100.0	100.0	

To note any important differences between the diagnosed groups, the research probe has been divided according to the field of discipline for the purpose of comparison (Table 2B and 2C). The statistical analysis indicated that students of sociology were generally younger by one year, when compared to the students of pedagogy. Although, all the students had the same educational experience at the university at the time when the study has been conducted. This lead to the assumption that the acquired language skills in understanding of the scientific language were comparable. Thus, the aforementioned difference had no important meaning when it came to the comparison of the diagnosed groups.

Table 2B

Age – Sociology

N	Acknowledged	98
	Lack of Data	0
Average		1994.2959
Median		1995.0000
Dominant		1995.00
Standard Deviation		1.02755
Variance		1.056
Min		1990.00
Max		1997.00

Table 2C

Age – Pedagogy

N	Acknowledged	97
	Lack of Data	0
Average		1994.1237
Median		1994.0000
Dominant		1994.00
Standard Deviation		1.00268
Variance		1.005
Min		1990.00
Max		1996.00

The research group varied also distinctively in terms of their places of origin (Table 3). The biggest pool of the students (33.8%) came from large towns (numbering from 50 000 - 200 000 habitants). The second largest group (22.6%) represented metropolises (above 200 000 habitants) mainly Wrocław. The third largest population represented villages (21.5%). Fourth group (12.3%) marked small towns (from 5 000 - 10 000 habitants) as their place of origins. The smallest group represented the medium towns (from 11 000 - 20 000 habitants).

Table 3A

Research group in the perspective of habitat

Type	Quantity	%	% Acknowledged	% Cumulative
Village	42	21.5	21.5	21.5
Small Town	24	12.3	12.3	33.8
Medium Town	19	9.7	9.7	43.6
Large Town	66	33.8	33.8	77.4
Metropolitan area	44	22.6	22.6	100.0
Summary	195	100.0	100.0	

To note any important differences between the diagnosed groups, the research probe has been divided according to the field of discipline for the purpose of comparison (Table 3B and 3C). The statistical analysis indicated that there were no notable differences between the compared groups.

The research group from a gender point of view was greatly unbalanced (Table 4). The majority of the research probe consisted of women (89.2%), with only 10.8% including man. Although methodologically incorrect, in terms of social comparison, the disproportion correctly represents the demographical tendencies of recruitment for the specific type of studies in Poland, in which social studies are dominated by female students.

Table 3B
Habitat – Sociology

N	Acknowledged	98
	Lack of Data	0
Average		3.1531
Median		4.0000
Dominant		4.00
Standard Deviation		1.45978
Variance		2.131
Min		1.00
Max		5.00

Table 3C
Habitat – Pedagogy

N	Acknowledged	97
	Lack of Data	0
Average		3.3196
Median		4.0000
Dominant		4.00
Standard Deviation		1.49685
Variance		2.241
Min		1.00
Max		5.00

Table 4
Research group in the perspective of gender

	Quantity	%	% Acknowledged	% Cumulative
Male	21	10.8	10.8	10.8
Female	174	89.2	89.2	100.0
Summary	195	100.0	100.0	

One of the most important variables for this study was the average grade score. The average grade represented the score which the students have achieved at the end of their 1st year of studies. The majority of the students (representing both disciplines) ended their course with an average grade of 4.00 (45.1%). The second most common score was 3.50 (29.2). The third most common score was 4.50 (22.6%). The lowest (3.00) and highest scores (5.00) had been achieved equally only by 1.5% of the diagnosed students.

Table 5A

Research group in the perspective of average grade semester score

	Quantity	%	% Acknowledged	% Cumulative
3.00	3	1.5	1.5	1.5
3.50	57	29.2	29.2	30.8
4.00	88	45.1	45.1	75.9
4.50	44	22.6	22.6	98.5
5.00	3	1.5	1.5	100.0
Summary	195	100.0	100.0	

To note any important differences between the diagnosed groups, the research probe has been divided according to the field of discipline for the purpose of comparison (Table 5B and 5C). General comparison of the grades of the students, representing both disciplines, showed that the groups were very similar in terms of achieved scores, where there were no statistically important differences. Thus it has been assumed that the students had relatively the same educational potential, or that the difficulty for scoring proper grades, in students mother-Institutes, were very comparable.

Table 5B

Average score sociology

N	Aknowledged	98
	Lack of Data	0
Average		3.9133
Median		4.0000
Dominant		4.00
Standard Deviation		.39341
Variance		.155
Min		3.00
Max		5.00

Table 5C

Average score pedagogy

N	Aknowledged	97
	Lack of Data	0
Average		4.0206
Median		4.0000
Dominant		4.00
Standard Deviation		.40128
Variance		.161
Min		3.00
Max		5.00

More precise comparison (Table 5D and 5E), indicated that internally, there were some differences, mainly in the distribution of the scored grades in the compared groups. The results showed that both groups scored the same number (44) of the most common grade (4.00). Although, students of sociology scored lower -3.50 - grades (35.7%) than their pedagogical counterparts (22.7%). Also, students of pedagogy scored higher – 4.50 – grades (28.9%) than the students of sociology (16.3%). Thus, it can be assumed that students of pedagogy, who took part in the language test, were more efficient in the education process than the students of sociology.

Table 5D

Distribution of grades Sociology

	Quantity	%	% Acknowledged	% Cumulative
3.00	1	1.0	1.0	1.0
3.50	35	35.7	35.7	36.7
4.00	44	44.9	44.9	81.6
4.50	16	16.3	16.3	98.0
5.00	2	2.0	2.0	100.0
Summary	98	100.0	100.0	

Table 5E

Distribution of grades Pedagogy

	Quantity	%	% Acknowledged	% Cumulative
3.00	2	2.1	2.1	2.1
3.50	22	22.7	22.7	24.7
4.00	44	45.4	45.4	70.1
4.50	28	28.9	28.9	99.0
5.00	1	1.0	1.0	100.0
Summary	97	100.0	100.0	

An important issue that demands explanation is the potential evaluation difference between the competent judges. To solve such issue the Wilcoxon rank test has been used (the rank results have been cumulated in table 6).

Table 6

Wilxocon rank test – comparison of scoring by the competent judges

		N	Average rank	Summary rank
pkt.sumaB - pkt.sumaA	Negative ranks	157[a]	102.85	16148.00
	Positive ranks	31[b]	52.19	1618.00
	Bounds	7[c]		
	Summary	195		

Note: a. pts.sumB < pts.sumA; b. pts.sumB > pts.sumA; c. pts.sumB = pts.sumA

The Wilcoxon test showed that there were some notable differences in scoring of the language tests by the competent judges. The analysis showed that in 157 cases judge A (pedagogue) scored the students' work higher than judge B (sociologist). However, judge B, had in 31 cases scored higher the students tests than judge A. Only in 7 cases the judges scored the tests equally. The analysis also revealed that the scoring differences between the judges were statistically significant, because the asymptotic significance indicator was lower than .005 (Table 7).

Table 7
Statistical significance of differences in scoring of the competent judges.

	pts.sumB - pts.sumA
Z	-9.729[a]
Asymptotic significance (double-side)	.000

Note: a. On the basis of positive ranks; b. Wilcoxon sign-rank test.

It was also important to check whether the competent judges were, from a statistical point of view, independent in their scoring process. For this purpose the T-Student Test was used (the result of the analysis has been shown in Table 8-10).

Table 8
Statistics for dependant probes

		Average	N	Standard Deviation	Standard Average Error
Pair 1	pts.sumA	35.1538	195	13.86150	.99264
	pts.sumB	27.1385	195	11.36899	.81415

There is visible difference in average scoring between the competent judges (Table 8). The judge A (pedagogue) was evaluating higher students tests in comparison to the judge B. Although what has been shown by the strength (,733) of correlation between summary scores of judge A and B (Table 9), that high positive correlation, had significant value, because it showed that the judges were judging students of pedagogy and sociology differently (more or less restrictively) although conserving similar general opinion in many particular cases about the students work. In other words, the judges were generally judging students work in the same way, although the judge from pedagogy was giving higher score points than the judge from sociology, for the same work of the students. Thus it has been assured that conducted interpretation of students work by competent judges on the general level had been conducted properly.

Table 9
Correlations for dependant probes

N	Correlation		N	Correlation	Significance
Pair 1	pts.sumA pts.sumB	&	195	.733	.000

Nevertheless the dependency test (Table 10), indicates that the similar points patterns between the judges are statistically significant, which showed that their judgement was not only independent, but also the evaluations done by the judges were equally reliable. It was also an important conclusion on how to present further research data that included points scores of students. After conducting the tests the conclusion was to present the language test data as an average result that included scores of both judges (the scores had been summed up and divided by two). That seemed more fair in terms of judgement of students work. Furthermore, it significantly reduced the amount of the data which demanded presentation.

Table 10

Test for dependant probes

		Differences for dependant probes							
				Standard	95% trust				Significance
		Average	Standard Deviation	Average Error	Lower Range	Higher Range	T	df	(double sided)
Pair 1	pts.sumA - pts.sumB	8.01538	9.50338	.68055	6.67316	9.35761	11.778	194	.000

As was mentioned before, the language test was divided into two parts: a paraphrase part and a definition part. Each part was divided into three main points fields. The first part included: points from paraphrasing, defining, and the summary score of the latter. The second part included: number of positively paraphrased sentences, number of positively defined terms, and the summary score of the latter. The results have been divided in context of the inhomogeneous research probe into three points pools: general, pedagogical, and sociological pools (Table 11). It has been done for the purpose of showing the potential differences between the students according to their field of discipline.

Table 11

Point pools

Pool General		pts.para	pts.def	pts.sum	s.para	s.def	s.para.def
N	Acknowledged	195	195	195	195	195	195
	Lack of Data	0	0	0	0	0	0
Average		15.5385	15.6077	31.1462	12.1256	11.6051	23.7308
Median		15.0000	16.0000	31.0000	12.0000	12.0000	24.5000
Dominant		12.00	17.50[a]	38.00	12.00	14.00[a]	17.50
Standard Deviation		6.25900	7.02691	11.7524	4.49666	4.69239	7.92608
Variance		39.175	49.378	138.119	20.220	22.019	62.823
Minimum score		.00	.00	.00	.00	.00	.00
Maximum score		34.50	33.00	64.50	23.50	21.50	43.50
Summary		3030.00	3043.50	6073.50	2364.50	2263.00	4627.50

Pool Sociology		pts.para	pts.def	pts.sum	s.para	s.def	s.para.def
N	Acknowledged	98	98	98	98	98	98
	Lack of Data	0	0	0	0	0	0
Average		15.2092	14.6480	29.8571	11.9337	10.7296	22.6633
Median		14.7500	15.5000	30.0000	11.5000	11.0000	23.5000
Dominant		12.00[a]	15.50	21.50	11.00	.00[a]	17.50
Standard Deviation		6.50255	7.71269	12.64605	4.61823	5.08341	8.31369
Variance		42.283	59.486	159.923	21.328	25.841	69.117
Minimum score		.00	.00	.00	.00	.00	.00
Maximum score		34.50	31.00	64.50	22.50	20.50	41.00
Summary		1490.50	1435.50	2926.00	1169.50	1051.50	2221.00

Pool Pedagogy		pts.para	pts.def	pts.sum	s.para	s.def	s.para.def
N	Acknowledged	97	97	97	97	97	97
	Lack of Data	0	0	0	0	0	0
Average		15.8711	16.5773	32.4485	12.3196	12.4897	24.8093
Median		15.5000	17.0000	33.0000	12.0000	13.0000	25.0000
Dominant		12.00a	20.50	38.00	12.00	14.00a	26.00a
Standard Deviation		6.01832	6.14721	10.68256	4.38581	4.10029	7.40124
Variance		36.220	37.788	114.117	19.235	16.812	54.778
Minimum score		2.00	.00	2.00	2.00	.00	2.00
Maximum score		31.50	33.00	59.00	23.50	21.50	43.50
Summary		1539.50	1608.00	3147.50	1195.00	1211.50	2406.50

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min.1 gained point); s.def – positive definitions (min.1 gained point); s.para.def – summary score from positive paraphrases and definitions; a - There are many modal values. The lowest score has been shown.

The average result scored by the students was 31 points out of 120 possible. It showed that for most of the students 75% of the test content was not properly understood. Because it is not possible to impose standards in this matter, it is hard to say if the obtained results are relatively low or high. Only the maximum score (64.5 pts) which was generated by one student of sociology can be helpful in this matter. In this perspective the average and median score seemed more satisfactory, because nearly 50% of the proposed content for decoding was understandable.

Comparative analysis showed also that in every scoring field (Table 11. Summary), students of pedagogy had higher summary scores than students of sociology. Also it should be noted that students of sociology in terms of their linguistic potential, achieved more varied scores (Table 11. Variance). Thus, it can be assumed that students of sociology were more linguistically diverse, whereas students of pedagogy seem to be more homogeneous in this matter. The results were interesting, because the language test had been created in favour of the students of sociology.

It was important to set, if the obtained results were statistically significant between the students representing two familiar although different fields of study. For this purpose there has been conducted single-factor ANOVA test.

Table 12

Single-factor ANOVA test – field of study comparison

		Sum. of squares	df	Average Square	F	Significance
pkt.para	Between groups	21.361	1	21.361	.544	.462
	Inside groups	7578.601	193	39.267		
	Total score	7599.962	194			
pkt.def	Between groups	181.464	1	181.464	3.727	.055
	Inside groups	9397.775	193	48.693		
	Total score	9579.238	194			
pkt.sum	Between groups	327.342	1	327.342	2.387	.124
	Inside groups	26467.742	193	137.139		
	Total score	26795.085	194			
s.para	Between groups	7.260	1	7.260	.358	.550
	Inside groups	3915.412	193	20.287		
	Total score	3922.672	194			
s.def	Between groups	151.021	1	151.021	7.074	.008
	Inside groups	4120.574	193	21.350		
	Total score	4271.595	194			
s.para.def	Between groups	224.506	1	224.506	3.622	.059
	Inside groups	11963.109	193	61.985		
	Total score	12187.615	194			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The F-indicator, was in four (pkt.def; pkt.sum; s.def; s.para.def) out of six point fields higher than 1, which meant that in those fields there were some significant differences between the analysed groups. Although the significance rank was close to the estimated 0.05 level of trust only in one occasions (s.def). So it has been assumed that some differences were only statistically insignificant in-between the fields of study with reference to the results obtained in the process of quantity of writing definitions of scientific terms.

The obtained results were correlated with some social variables to check if there were any significant statistical tendencies.

Table 13

Important correlations between the variables

General Pool		pkt.para	pkt.def	pkt.sum	s.para	s.def	s.para.def
Field of study	Pearson Correlation	-.053	-.138	-.111	-.043	-.188**	-.136
	Significance (double sided)	.462	.055	.124	.550	.008	.059
	N	195	195	195	195	195	195
Age	Pearson Correlation	-.061	-.092	-.087	-.065	-.083	-.086
	Significance (double sided)	.398	.203	.226	.366	.249	.232
	N	195	195	195	195	195	195
Avegrade grade	Pearson Correlation	.321**	.259**	.325**	.315**	.277**	.342**
	Significance (doublesided)	.000	.000	.000	.000	.000	.000
	N	195	195	195	195	195	195
Habitat	Pearson Correlation	.164*	.219**	.218**	.146*	.203**	.203**
	Significance. (double sided)	.022	.002	.002	.042	.004	.004
	N	195	195	195	195	195	195
Gender	Pearson Correlation	.087	.175*	.151*	.060	.200**	.152*
	Significance (double sided)	.227	.014	.035	.408	.005	.033
	N	195	195	195	195	195	195
efather	Pearson Correlation	-.028	.048	.014	-.015	.063	.029
	Significance (double sided)	.701	.509	.849	.839	.383	.688
	N	195	195	195	195	195	195
emother	Pearson Correlation	.057	.120	.102	.069	.123	.112
	Significance (double sided)	.425	.095	.155	.341	.086	.119
	N	195	195	195	195	195	195

Note: e.father – education level of father; emother – education level of mother; pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The correlation analysis reveals that there were only three notable relations: between average grade gained by the students at the end of 1st year of study; between the size of students origin habitat; between gender - all referred to the result obtained by the students in six of the points fields of the conducted language test.

To check if these correlations were statistically significant, each of the variables was tested with a single-factor ANOVA test, in relation to the

scores gained by the students in the language test. The first tested variable was the average grade gained by the student at the end of the 1st year of studies (Table 14).

Table 14

Single-factor ANOVA test result: Average Grade – Language Test Result

		Sum. of squares	df	Average square	F	Significance
pkt.paraC	Between groups	915.979	4	228.995	6.509	.000
	Inside groups	6683.983	190	35.179		
	Total score	7599.962	194			
pkt.defC	Between groups	770.091	4	192.523	4.152	.003
	Inside groups	8809.147	190	46.364		
	Total score	9579.238	194			
pkt.sumC	Between groups	3364.367	4	841.092	6.820	.000
	Inside groups	23430.718	190	123.320		
	Total score	26795.085	194			
s.paraC	Between groups	463.200	4	115.800	6.360	.000
	Inside groups	3459.472	190	18.208		
	Total score	3922.672	194			
s.defC	Between groups	387.001	4	96.750	4.732	.001
	Inside groups	3884.594	190	20.445		
	Total score	4271.595	194			
s.para. defC	Between groups	1694.752	4	423.688	7.672	.000
	Inside groups	10492.863	190	55.226		
	Total score	12187.615	194			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The test revealed that in each of the language point fields the relation between the result from the language test and the average grade gained by the students is strong (F-indicator higher than 1) and statistically significant (significance indicator lower than .005).

The second important correlation was between the language test and the size of students habitat. This relation also has been tested by the single-factor ANOVA test (Table 15).

Table 15

Single-factor ANOVA test result: Students Habitat – Language Test Result

		Sum. of squares	df	Average square	F	Significance
pkt.paraC	Between groups	233.959	4	58.490	1.509	.201
	Inside groups	7366.002	190	38.768		
	Total score	7599.962	194			
pkt.defC	Between groups	481.176	4	120.294	2.512	.043
	Inside groups	9098.063	190	47.885		
	Total score	9579.238	194			
pkt.sumC	Between groups	1320.072	4	330.018	2.461	.047
	Inside groups	25475.013	190	134.079		
	Total score	26795.085	194			
s.paraC	Between groups	102.096	4	25.524	1.269	.284
	Inside groups	3820.576	190	20.108		
	Total score	3922.672	194			
s.defC	Between groups	185.016	4	46.254	2.151	.076
	Inside groups	4086.579	190	21.508		
	Total score	4271.595	194			
s.para.defC	Between groups	521.291	4	130.323	2.122	.080
	Inside groups	11666.325	190	61.402		
	Total score	12187.615	194			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The test revealed that in each of the language point fields the relation between the result from the language test and the average grade gained by the students is strong (F-indicator higher than 1) but not statistically significant (significance-indicator higher than .005). Thus, according to the positive correlation between variables and the ANOVA test result, it can be assumed that there is no important relationship involving these two phenomena, in accordance to the general research probe.

The last important correlation involved the gender variable. The ANOVA test result were as follows (Table 16):

Table 16

Single-factor ANOVA test result: Gender & Language Test Result

		Sum. of squares	df	Average square	F	Significance
pkt.paraC	Between groups	57.440	1	57.440	1.470	.227
	Inside groups	7542.521	193	39.080		
	Total score	7599.962	194			
pkt.defC	Between groups	294.303	1	294.303	6.117	.014
	Inside groups	9284.936	193	48.108		
	Total score	9579.238	194			
pkt.sumC	Between groups	611.780	1	611.780	4.509	.035
	Inside groups	26183.304	193	135.665		
	Total score	26795.085	194			
s.paraC	Between groups	13.899	1	13.899	.686	.408
	Inside groups	3908.773	193	20.253		
	Total score	3922.672	194			
s.defC	Between groups	171.613	1	171.613	8.078	.005
	Inside groups	4099.982	193	21.243		
	Total score	4271.595	194			
s.para.defC	Between groups	283.191	1	283.191	4.591	.033
	Inside groups	11904.424	193	61.681		
	Total score	12187.615	194			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The test revealed that in some of the language point fields the relation between the result from the language test and gender is strong (F-indicator higher than 1) but not statistically significant (significance-indicator higher than .005). The only notable statistical relation was between gender and the summary score from the definition part of the language test (s.defC). Thus, according to the positive correlation between variables and the ANOVA test result, it can be assumed that there is no important relation involving these two phenomena in accordance to the general research probe. The only relation involving the score from the definition part of the language test suggested that female students were slightly better at this skill. Although because of the weak strength of the correlation (lower than .200) and unsymmetrical structure of the probe (domination of female students) this relation is not representative enough to formulate any general conclusions in this matter.

In the previous results there was a noticeable tendency toward students of pedagogy, who were slightly more effective in their task of decoding of the scientific sentences, although the correlations did not confirm that on the level of general research probe. To exclude any other major possibilities, there have been conducted correlation tests on the research group, that included the difference in the field of scientific discipline (Table 17 and 18).

Table 17

Correlations – Sociology Research Group

Sociology Pool		pkt.para	pkt.def	pkt.sum	s.para	s.def	s.para.def
Age	Pearson Correlation	-.035	.101	.044	-.040	.136	.061
	Significance (doublesided)	.734	.322	.669	.693	.182	.553
	N	98	98	98	98	98	98
Average grade	PearsonCorrelation	.191	.098	.158	.180	.094	.157
	Significance (doublesided)	.060	.338	.121	.076	.358	.122
	N	98	98	98	98	98	98
Habitat	PearsonCorrelation	.188	.156	.192	.167	.138	.177
	Significance (double sided)	.063	.124	.058	.101	.177	.082
	N	98	98	98	98	98	98
Gender	Pearson Correlation	.078	.163	.140	.060	.187	.147
	Significance (double sided)	.443	.108	.170	.559	.066	.148
	N	98	98	98	98	98	98
efather	Pearson Correlation	3.00	-.038	-.124	-.197	-.002	-.111
	Significance (double sided)	3.50	.707	.223	.052	.982	.278
	N	98	98	98	98	98	98
emother	Pearson Correlation	-.247	-.097	-.186	-.244	-.066	-.176
	Significance (double sided)	.014	.342	.067	.015	.517	.083
	N	98	98	98	98	98	98

Note: e.father – education level of father; mother – education level of mother; pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

Table 18

Correlations – Pedagogy Research Group

Pedagogy Pool		pkt.para	pkt.def	pkt.sum	s.para	s.def	s.para.def
Age	Pearson Correlation	-.081	-.318	-.229	-.085	-.332	-.234
	Significance (doublesided)	.430	.001	.024	.408	.001	.021
	N	97	97	97	97	97	97
Average grade	Pearson Correlation	.453	.431	.503	.450	.464	.524
	Significance (doublesided)	.000	.000	.000	.000	.000	.000
	N	97	97	97	97	97	97
Habitat	Pearson Correlation	.134	.288	.241*	.120	.271	.221
	Significance (doublesided)	.190	.004	.017	.242	.007	.029
	N	97	97	97	97	97	97
Gender	Pearson Correlation	.085	.140	.128	.044	.148	.108
	Significance (doublesided)	.410	.171	.210	.670	.148	.293
	N	97	97	97	97	97	97
efather	Pearson Correlation	.124	.106	.131	.150	.082	.134
	Significance (doublesided)	.225	.301	.200	.142	.425	.189
	N	97	97	97	97	97	97

emother	Pearson Correlation	.288	.314	.343	.300	.290	.339**
	Significance (doublesided)	.004	.002	.001	.003	.004	.001
	N	97	97	97	97	97	97

Note: e.father – education level of father; mother – education level of mother; pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The analysis of the divided groups, indicated that the differences in the strength of correlation within the groups between variables were clearly visible. In the students of sociology research group there were no important correlations, beside the weak negative correlation between the educational level of mother and the test results represented by the number of points from paraphrasing (-.247) and the number of conducted paraphrases (-.244).

Table 19

Single-factor ANOVA test; Age & Language test Result; Pedagogy Research Probe.

		Sum. of squares	df	Average square	F	Significance
pkt.paraC	Between groups	80.580	6	13.430	.356	.905
	Inside groups	3396.560	90	37.740		
	Total score	3477.139	96			
pkt.defC	Between groups	603.870	6	100.645	2.996	.010
	Inside groups	3023.800	90	33.598		
	Total score	3627.670	96			
pkt.sumC	Between groups	898.735	6	149.789	1.341	.248
	Inside groups	10056.507	90	111.739		
	Total score	10955.242	96			
s.paraC	Between groups	27.156	6	4.526	.224	.968
	Inside groups	1819.437	90	20.216		
	Total score	1846.593	96			
s.defC	Between groups	270.426	6	45.071	3.019	.010
	Inside groups	1343.564	90	14.928		
	Total score	1613.990	96			
s.para. defC	Between groups	396.562	6	66.094	1.223	.302
	Inside groups	4862.160	90	54.024		
	Total score	5258.722	96			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The results of the students of pedagogy indicated some important correlations between age, average grade, and education level of mother in confrontation with the language test results. The first notable weak negative correlations have been noted between the age and the test results obtained by students in

four out of six point fields. Because of that, it has been assumed that the lower the age of the students of pedagogy, the higher scores they earned from the language test. The result was interesting because it stood in opposition to the most common assumption that the skills in one's own language are strictly connected with one's experience. To check if that relation is significant form a statistical point of view, it has been tested with a single-factor ANOVA test (Table 19).

The analysis revealed that there is no notable statistical relation between the age and the result obtained by students of pedagogy form the language test. In some points fields the F-indicator has been higher than the minimum 1, although the significance indicator of the relation did not point to any important tendencies.

Table 20

Single-factor ANOVA test – Average Grade & Language Test Result. Pedagogy Research Probe.

		Sum. of squares	df	Average square	F	Significance
pkt.paraC	Between groups	724.698	4	181.174	6.056	.000
	Inside groups	2752.442	92	29.918		
	Total score	3477.139	96			
pkt.defC	Between groups	692.689	4	173.172	5.428	.001
	Inside groups	2934.981	92	31.902		
	Total score	3627.670	96			
pkt.sumC	Between groups	2809.448	4	702.362	7.933	.000
	Inside groups	8145.795	92	88.541		
	Total score	10955.242	96			
s.paraC	Between groups	381.316	4	95.329	5.985	.000
	Inside groups	1465.277	92	15.927		
	Total score	1846.593	96			
s.defC	Between groups	356.388	4	89.097	6.518	.000
	Inside groups	1257.601	92	13.670		
	Total score	1613.990	96			
s.para.defC	Between groups	1460.803	4	365.201	8.847	.000
	Inside groups	3797.919	92	41.282		
	Total score	5258.722	96			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

The second distinctive correlation, was noted between the average grade from studies and the language test result. The correlation has been described as medium in strength and positive. Thus there was made an assumption that the higher ending grades were obtained by students with more efficient decoding/encoding skills in relation to the academical content. This result was very important from a theoretical point of view, because it gave strong basis to formulate the main conclusions. Although as before, the correlation result

has been tested with a single-factor ANOVA test, to check if that correlation is statistically significant (Table 20.)

The result indicated that there is a very strong statistical tendency between the average grade gained by the student at the end of the semester of study and the result of the language test. The result is also very important because it confirms the same tendency, discovered on the General Research Pool level, presented earlier in the text.

Other weak positive correlations have been noted between the size of the original habitat of students and the score from the language test. Although those correlations were not so distinctive as they were in the previous described variables, because weak connections have been noted in four out of six point fields. It has been assumed that in case of students of pedagogy there has been a weak tendency in which higher language test score were gained by students from more populated habitats than those from less populated habitats. To confirm or refute that assumption, there has been used the single-factor ANOVA test (Table 21).

Table 21

Single-factor ANOVA test – Students Habitat & Language Test Result. Pedagogy Research Probe

		Sum. of squares	df	Average square	F	Significance
pkt.paraC	Between groups	124.814	4	31.204	.856	.493
	Inside groups	3352.325	92	36.438		
	Total score	3477.139	96			
pkt.defC	Between groups	417.660	4	104.415	2.993	.023
	Inside groups	3210.010	92	34.891		
	Total score	3627.670	96			
pkt.sumC	Between groups	928.907	4	232.227	2.131	.083
	Inside groups	10026.335	92	108.982		
	Total score	10955.242	96			
s.paraC	Between groups	59.865	4	14.966	.771	.547
	Inside groups	1786.728	92	19.421		
	Total score	1846.593	96			
s.defC	Between groups	167.415	4	41.854	2.662	.037
	Inside groups	1446.574	92	15.724		
	Total score	1613.990	96			
s.para.defC	Between groups	393.454	4	98.364	1.860	.124
	Inside groups	4865.268	92	52.883		
	Total score	5258.722	96			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

Analysis revealed that there are some relations (F-indicator higher than 1) between scores in some parts of the test and the size of original habitat, although they are not statistically significant, because none of the relations were lower than .005. Therefore, it is clear that because of the weak strength of the correlations (strength of the correlation lower than .300) and the insignificant statistical relation between the variables, any strong statements about relations between the phenomena cannot be made.

The last notable weak correlation has been observed between the mother's level of education and the test result of the student. It is noteworthy, that the positive correlation has been observed in all six point fields, thus it can be assumed that the higher the educational level of the mother, the better were the students skills in encoding/decoding of the academic content. The relation between the variables had been tested with a single-factor ANOVA test (Table 22).

Table 22

Single-factor ANOVA test – Education Level of Students Mother & Language Test Result. Pedagogy Research Probe

		Sum. of squares	df	Average square	F	Significance
pkt.paraC	Between groups	469.608	5	93.922	2.842	.020
	Inside groups	3007.531	91	33.050		
	Total score	3477.139	96			
pkt.defC	Between groups	722.703	5	144.541	4.528	.001
	Inside groups	2904.967	91	31.923		
	Total score	3627.670	96			
pkt.sumC	Between groups	2326.069	5	465.214	4.906	.001
	Inside groups	8629.173	91	94.826		
	Total score	10955.242	96			
s.paraC	Between groups	225.351	5	45.070	2.530	.034
	Inside groups	1621.242	91	17.816		
	Total score	1846.593	96			
s.defC	Between groups	303.649	5	60.730	4.218	.002
	Inside groups	1310.341	91	14.399		
	Total score	1613.990	96			
s.para.defC	Between groups	1018.163	5	203.633	4.370	.001
	Inside groups	4240.558	91	46.600		
	Total score	5258.722	96			

Note: pts.para – points from paraphrasing; pts.def – points from defining; pts.sum – summary from paraphrasing and defining; s.para – positive paraphrases (min. 1 gained point); s.def – positive definitions (min. 1 gained point); s.para.def – summary score from positive paraphrases and definitions.

Discovered correlation has been confirmed as statistically important in four out of six point fields (significance indicator lower than .005).

Conclusions

Education processes during higher studies are internally stable and systematic macro-processes, which are filled with scientific/specialistic language, used to transfer the knowledge to the students. The language is also used to re-socialise students in their field of knowledge. According to the results of the study, 75% of the content used and transferred to the students is not understood by them or the students have serious problems in understanding it. This fact raises an important question about the logic and structure of the linguistic socialisation of the students during their higher education.

Furthermore, it is evident that the high-schools in Poland do not linguistically prepare students for university studies (and according to the European scholarly tradition this is their main task) which might cause serious consequences in the long term processes for the university itself. Such consequences are already evident and are summed up in such terms as Alan Bloom's "mass higher education", Emanuel Bodoun's "equality against quality" or Steven Coleman's "factories of diplomas" or "factories of the unemployed". Each of these terms has a negative notion which suggests that generally the quality of both students and higher education is decreasing.

But it is also noteworthy that such statements in the context of the cultural, social and economical changes, which are inflicting higher studies in Poland, can be misleading in the final judgement. Firstly, mass education is a serious problem when it is not combined with a solid quality of the institution. Those students who had higher language skills achieved both higher language test scores and higher grades during studies. Thus, maybe the university is not brutally selecting candidates (through expulsion from the institutions) but is promoting the more gifted ones through higher grades throughout the educational process. Whether these processes of promotion need to be preserved and in what form is a matter of debate, but at this point the condition clearly shows that Polish studies put some pressure on such skills of students as understanding of the academic language, which is a very important part of the tradition of the institution itself.

The second main conclusion is the visible language difference between students representing similar field of sciences. It must be clear, that those differences are not statistically significant, so creating a strong thesis about such phenomena is unacceptable. However, these noticeable differences raise more questions about which variables or factors created this situation, since the most commonly used social variables such as: age, gender, size of habitat, and education level of parents do not have effect on the academic language skills of the students.

From a theoretical point of view it is possible that the differences between the students can have internal or external origins. Some of the external origins can be connected to the type and quality of high schools (also to the results of the "matura" exam) graduated by the students, before they had begun university studies. Having siblings by the student can also be an important factor.

The internal factors can consist of such variables as level of motivation in solving the language test and level of empathy. It is hard to say how big is the influence of self-motivation in solving the language test, because many factors (such as: physical and mental health, diet, sleep, time of day, engagement, attention, environment etc.) can influence the level of motivation. Thus there are a lot of factors which can influence the outcome of such test. Although the aim of this study was to study the language potential of the students not at their best possible physical-psychological condition, but during the most common day of study, thus it can be assumed that none of the students was favoured, thus the conditions of fulfilling the test were practically comparable and reliable in the case of all students.

The second important factor is the level of empathy of every student. As it has been shown in the study of Marco Iacoboni, because of the construction of our brain, and the fact the some parts of that brain are neurally closely connected, empathy, language, and imitation are strictly connected with each other, thus lack in each of those skills/features may influence the functioning of the other (Iacobini, 2005, p.2). It can be assumed that students of pedagogy are the ones who should represent higher level of empathy than students of sociology.

Also interesting was the result of the Pearson test and single-factor ANOVA test, related to relation between mother's level of education and results of the language test. Firstly, it is hard to explain why such tendency had only occurred in the students of pedagogy. Secondly, connection between the variables can be explained by the cultural role of women in socialisation of children. In Western cultures (but not only Western) mother is more responsible for the development of her child than father. Thus the woman spends more time with the child feeding it, caring for it, and talking to it more often. Because of that, it can be assumed that maybe the language skills in decoding/encoding language content can be more dependant on the primary relationship between the mother and her infant.

Also there is the other factor in the form of the level of woman's education. From the results we can assume that the level of education of the mother is more strictly connected to the quality of the primary and secondary socialisation of the child. Although because of the limited scope of the study is should be noted that such statements need further studies to enforce such claims.

This study is a solid basis for further research of the problem. The limited scope of the study (only students of social sciences were participants) gives only an impression of a specific phenomenon, specific type of scientific language, specific type of studied social groups, and primary condition of the study itself. Because of lack of such specialised research in Poland, it should be emphasises that this study was a step into a "blank" field of knowledge, which up to this point remained without any strong and reliable empirical data. Results obtained from the study create a very good background for improvement of the research tools and expansion of the theoretical basis. It seems that a perfect ground for such future research are comparative studies involving students from various fields of sciences and perhaps also high-school students.

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