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INVESTIGATION OF PERSISTENCE VALUE AS A STUDY PROTECTION FACTOR AMONG HEALTH CARE ORGANIZER STUDENTS

Introduction: To be successful, serious commitment, willingness of being involved in education and learning (on the part of the students), and (on the part of the education institution) demand for high standard are required. One of the most important determinants of student achievement is persistence, the research of which has now been in the focus of international investigation. *Objective:* The authors investigated variables affecting students' persistence value (e.g. attendance at lessons, parents' religiousness, use of the Internet, sports, etc.) among students starting their health care studies. *Method:* The students participating in the survey were – as mentioned – the first year (BSc) students specialising in health care organisation at the Public Health Care Departments of Semmelweis University, the University of Debrecen (and Nyíregyháza) (N = 200 persons). *Results:* 1. By using GLZ regression (Likelihood Ratio Chi-Square = 115.688, df = 13, p = 0.000), the explanatory variables – that most influence the value of the persistence variance – were filtered. (i) E.g. Attendance at the lessons, Extra rewards, Sports, Parents' Religiousness, Community Membership are of positive effect. (ii) The use of Internet has a negative impact in the model. 2. Cluster analysis was used to produce student groups from the predictor variables. *Conclusion:* Examining students' persistence values can help university faculties, the teachers to see, who will succeed in their studies, and who need increased help to evolve and develop their mental potentials.

Keywords: higher education, persistence, well-being, regression analysis

Untersuchung des Ausdauerwertes als Schutzfaktor im Studium bei Studenten des Faches Management im Gesundheitswesen: *Einleitung:* Zum Erfolg von Studenten beim Studium sind seitens der Studenten Engagement, Teilnahmebereitschaft und Lernen, seitens der Einrichtung hohe Erwartungen erforderlich. Ein sehr wichtiger Faktor des Erfolgs bei Studenten ist Ausdauer (Persistenz), die derzeit im Mittelpunkt der internationalen Forschung steht. *Ziele:* Es wurden unter Studenten des ersten Semesters für Gesundheitswissenschaften bestimmte Variablen untersucht, die den Persistenzwert der Studenten beeinflussen (z.B. Besuch der Lehrveranstaltungen, Religiosität der Eltern, Internetnutzung, Sport usw.). *Methode:* An der Untersuchung haben Studenten der Fakultät für öffentliche Dienste der Semmelweis-Universität und der Fakultät für Gesundheit

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der Universität Debrecen (in Nyíregyháza) teilgenommen. Die Teilnehmer (n = 200) studierten Management im Gesundheitswesen (BSc) im ersten Semester. *Ergebnisse:* 1. Mithilfe der GLZ-Regression (Wahrscheinlichkeit Chi-Quadrat = 115,688, df = 13, p = 0,000) wurden die erklären-den Variablen ausgewählt, die die abhängige Variable Persistenz am stärksten beeinflussen: (i) Eine positive Wirkung hatten u. a. der Besuch der Lehrveranstaltungen, Bonuspunkte, Sport, Reli-giosität der Eltern und die Mitgliedschaft in einer Gemeinde. (ii) Internetnutzung zeigte im Modell eine negative Wirkung. 2. Aus den Prädiktorvariablen wurden mithilfe der Faktoranalyse Leis-tungsgruppen der Studenten gebildet. *Fazit:* Die Analyse der Persistenzwerte von Studenten kann sowohl den Fakultäten als auch den Dozenten helfen, festzustellen, welche Studenten ihr Studium erfolgreich absolvieren werden und welche Studenten beim Studium besondere Hilfe benötigen, um ihr volles Potenzial entfalten zu können. Die Ergebnisse sollen weiter analysiert und bei einer größeren Stichprobe bestätigt werden.

Schlüsselbegriffe: Hochschulbildung, Persistenz, Regressionsanalyse

1.1. Preface

Students in the world of higher education do not know what 'study' path leads to the diploma, and this path is usually not unobstructed. If a student is ready to mobilise or develop his skills (self-belief, commitment, strong motivation, endurance, etc.), then he is mentally prepared for the challenge.

Those who possess adequate mental toughness[1] – that shows a goal oriented thinking in a good sense of the word – persevere in pursuit of their intended purpose until the expected result, i.e. getting their degree, which also means a commitment to decision-making. This kind of perseverance can be called long-term endurance.

Preparation for further education during the high school period is also accom-panied by perseverance, which helps the student to get into the desired faculty and makes it likely to finish it successfully, avoiding dropping out. This endurance can be termed 'prevention' as well, because it serves as a protective basis for avoiding dropouts. In our research, therefore, we considered it important to examine this securi-ty net for students entering tertiary education to get acquainted with its most import-ant elements, with whom the students' achievement can be successfully influenced.

The *healthcare organisation specialisation* in an aging society has been set up to help doctors with their more and more difficult work by taking over some work – in the area of healthcare – belonging to the competence of information technology.

The objective of this study is to reveal the factors supporting students' persist-ence values (at the early phase of their university career, i.e. at the beginning of their professional studies) among students specialised in health care organisation and to try to answer how much the persistence is present in the course of the higher educa-tion of the students, what factors affect their persistence and what the characteristics of the groups representing the various persistence values are.

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[1]   The term of 'mental toughness' comes from sports psychology (SHEARD 2013).

In our research, we are trying to point out how persistence as a protective factor in the initial investment of the first year students plays an important role in their academic well-being.

1.2. Introduction

As a result of the expansion of higher education, more and more families can afford to let their children go to higher education providing them – later – with social and economic benefits. From an educational point of view, heterogeneous student composition, diversity of interests and values make learning objectives more difficult (Hrubos 2005; Hrubos 2007).

Becoming a university student is considered as a success requiring a preliminary investment from both the student and the social environment. Having entered higher education, an additional investment is required by the students to complete their studies and obtain a degree because there is a very significant dropout rate. In many cases – in course of time – students' ideas, the degree of persistence and determination change, however, they know that the invested amount and quality of effort will bring further success (Kuh et al. 2008).

The youngster – who is already a student and continues to be successful – theoretically has a personal career plan to progress and wants to lead a life with an engagement in their academic studies (Tinto 2006; Pusztai 2011). These are supplemented by their determined participation in learning processes, by the integration into the learning environment and due motivation (Astin 1993). According to Heuser's research, a student is successful if they find their studies meaningful, do some work as a volunteer and perform their studies accepting the norm system of the institution (Heuser 2007).

The acquisition of the utmost knowledge is associated with the student's role, however, the conscious development of connections with the role partners and social integration are also facilitators of socialisation (Weidman 2001). Embedding into the social, educational relationship network of the institution means successful student socialisation, which is fulfilled in the process of professionalisation (Tinto 1993).

To start an application for an institution of higher education, the student must be sufficiently prepared and must have correct self-knowledge, judgement and adequate inspiration. If these qualities are missing or are not of adequate extent – yet the student was admitted – correction is necessary. If a higher education institution is considered as a tool kit by a student, then in a good case, they have only to use the tools. In other cases, some different technique should be used to persist and obtain their degree. The key to the first year students is the awareness of student intention, tuning, motivation and adaptation to the student's role, bearing in mind that it is the responsibility of the admitted student to take advantage of the given educational facilities and to complete their studies with good academic results. Of course, the process is accompanied by external (e.g. social status, national, ethnic affiliation) and internal (such as ability) characteristics influencing the subsequent success.

The basic idea behind the frequently quoted Tinto integration model is that a higher level of commitment to learning goals is derived from the characteristics present at the admittance but perseverance – as an indispensable component – is needed. According to the model, the performance is facilitated and enhanced by the active participation in the courses and the student communities. To keep the student in the educational system a high degree of academic and social integration is needed (Tinto 1997).

In higher education the driver of successful progress is the student's engagement, which means spending considerable time and energy on study processes. Its degree has a positive impact on success. Student interactions have a decisive effect on the individual's development. Astin (1984) accepts self-assessment of academic progress and considers that entering higher education according to the individual career plan, commitment to studies and doing work in accordance with the academic standards is a success.

At any prestigious level of higher education, between the input and the output, one of the important tasks of the student is learning, as it is one of the cornerstones of professionalisation. Only mentally healthy students are able to learn and acquire advanced knowledge. Learning is characterised by autonomy, resistance to stress, ability to interact effectively with the environment, and ability to cope with the difficulties of everyday life[2]. According to the *Green Paper: Improving the Mental Health of the Population: Towards a Strategy on Mental Health for the European Union*, mental health is a degree of well-being in which the individual's abilities are fulfilled, the person works hard and contributes to the life of his community (European Communities 2005). The concept of well-being encompasses what the individual can do, what he thinks and feels about what he can and must do (Newton 2007), as well as the awareness that implementation is often performed through active coping with difficulties (Keyes 1998). It is necessary, during the academic years, to form and develop skills in the students by which they not only survive their difficulties but which – in the meantime – help them to evolve their abilities. Determination can be enhanced with perseverance. Perseverance is the completion (despite the difficulties) of the tasks started, however, it is not perfectionism (Seligman 2002; Hu & St. John 2001).

Success is enhanced by 'success experience', and weakened by failure but, at the same time, it also raises the level of endurance and they jointly give the coping experiences that affect the individual's biological system determining the health stage. In students regarding hard learning tasks as challenges, study stress is of lesser degree and they are able to maintain a psychological and emotional health (Pikó 2010).

According to the intentional education model, time and effort investment, involvement, dedication to studies and commitment are indispensable to the student's socialisation (Karp 2008). In the sense of the definition of social integration, the student in higher education develops their own place in the institution according to their

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[2]   See: www.salutogenesis.hv.se/files/bengt_lindstrm_finland1.pdf (retrieved 5 June 2017).

subjective experiences. It is their own decision to make progress or to drop out. The feeling of being bound to the institution is enhanced by the development of information networks and group (social) relationships, all these helping to understand university life. (WEIDMAN 2001). The investigation of commitment to studies and academic engagement (e.g. scientific efforts, attending the lessons, etc.) can predict students' determination and persistence in relation to their studies they have begun (PASCARELLA & TERENZINI 1978).

It should also be remembered that the institutional environment highly appreciating future-conscious, performance-oriented behaviour and diligence is also an enhancing factor of a successful student career and creates a connection with the student enabling them to be steady in the fulfilment of the decisions made at individual level (PUSZTAI 2008).

Different professions usually perform a social mission, representing central values based on common agreement and their appearance is shown in meeting needs and are related to various fields of competence, like education, healthcare, etc. (KOZMA 2007). Professionalism can be defined as professional socialisation and the formation of intellectual profession due to higher education studies (PUSZTAI 2009).

Persistence intention in university studies is predicted by the combination of efficiency, socialisation, family support and stress. Torres and Solberg in their empirical study attempted to find relationship between student persistence and health involving effectiveness, stress effects, family support, and social inclusion factors (TORRES & SOLBERG 2001). Their results have shown that family support directly affects the level of performance and stress of study.

2. Sample and methods

The students participating in the survey were – as has already been mentioned – first year (BSc) students specialising in health care organisation at the Public Healthcare Departments of Semmelweis University, the University of Debrecen[3] (N = 200 persons). Data collection was carried out by the two universities – between 2014 and 2016, with differing research intentions – using on-line questionnaire survey structure, separated in space and time. The students filled in online questionnaires on the university Internet network, on a voluntary basis. The sample may be considered random because the students filled in the questionnaires as volunteers. Sample numbers: NSemmelweis = 98 (49%), NDebrecen = 102 (51%), Ntotal sample = 200 (100%). There is no significant difference between the two groups in the sample (p = 0.6892). The total sample is sufficiently large to carry out a statistical survey and to draw the appropriate conclusions.

For the statistical analysis, the identical variables of the two data sets were sorted out and brought to a unified, easy-to-process form. The number of all variables investigated amounts to 177. We developed continuous, aggregated dependent vari-

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[3]   Debrecen students, in the CHERD research program. Thank you for the opportunity in common.

ables (e.g. *Persistence* variables) and predictor variables (such as *Sports Activity, Permanent_Consumption_Items, etc.)* of the variables group.

2.1. Measuring means

2.1.1. Persistence variable

The degree of intensity of persistence was given by the values of the summing factors of the variables and values of the responses, consisting of 4 elements (Value of responses: 1 = Disagree; 2 = Agree):
  1. I would like to achieve the best academic results possible,
  2. I will do my best to attend lectures and practices,
  3. My current study will be useful in my career,
  4. I am very determined to finish my studies.

Presentation of forming of significant predictor variables based on the persistence[4] model:

2.1.2. Continuous variables

COMMUNITY_MEMBERSHIP: values of the summing factors and responses (Values of responses: 1 = I do not want to be a member; 2 = Yes, outside university; 3 = Yes, within university; 4 = Yes, both). **Elements:** denomination, student government, sports circle, orchestra, charity organisation, etc.

MOTHER'S_OCCUPATION: occupations could range from 1 to 8. **Elements:** does not work, unemployed, retired, leader, physical leader, intellectual leader, intellectual employee, intellectual etc.

ADDITIONAL_SCORES: it means the additional points (extra scores) of the student brought from secondary school. Values of answers: 1 = Did not receive; 2 = Received. **Elements**: language exam, advanced level of maturity exam, disability, sports achievement, etc.

VIEWS_ON_SPORT: expresses the opinion on sport. Values of answers: 1 = Disagrees; 2 = Agrees. **Elements:** helps to overcome stress, gives community, spiritually refreshing, love to compete, etc.

FRIEND_OUTSIDE_UNIVERSITY: you have a friend with whom you are doing the following activities. Values for each answer: 1 = No; 2 = Yes. **Elements:** he learns together when his friend gets sick, visits, helps, they are together in their

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[4]   The Hungarian variant of the measuring means of FRENCH et al. 2005.

leisure time, they plan the future together, he helps with private life problems, he lends the book his friend asked for.

A FRIEND_INSIDE_THE_UNIVERSITY: for a friend within a university, there was no significant (P=0.854) variable for the dependent variable in the model study. Which means that students **in the first year** are looking for a good social relationship among the old friends outside the university.

SPENDING_FREE_TIME: who do they do their following leisure activities with. (Values of responses: 1 = I do not; 2 = Not a university friend /acquaintance; 3 = with a university friend/acquaintance; 4 = Both). **Elements:** who do they talk to, who do they do religious practices with, who do they go to the cinema or theatre with, who do they talk to, who do they go on an excursion with, who do they meet on Internet pages?

ACADEMIC_VALUE: the student's opinion on academic values. Values of responses: 1 = I totally disagree; 2 = I tend to disagree; 3 = I agree. **Elements:** regular cheating at university – if a student plays truant from school or evades lessons; uses or borrows the texts of other authors without reference; lies if he or she can not hand the task in on time; uses books or notes at exams in an illegal way; has somebody to write their essays, and thinks if the cheating is revealed, it is only bad luck.

USE_OF_INTERNET: aggregated opinion on the use of the Internet. Values of the answers: 1 = Never; 2 = Rarely; 3 = at least once a month; 4 = at least once a week; 5 = daily. **Elements:** I watch video clips; I play; I visit the websites of my speciality and university, looking for technical material and downloading material for my subject.

VOLUNTARY_WORK: does the student carry out voluntary work? (Responses: 1 = Never; 2 = Occasionally; 3 = Regularly). **Elements:** I did free volunteer work at secondary school, I did free volunteer work at the university.

2.1.3. Categorical variables

- a) Did you attend paid special classes during secondary school (Responses: 1 = No; 2 = Yes)
- b) Did you mark the specialisation course in the first place (1 Responses: = No; 2 = Yes)
- c) What denomination do your parents belong to? (Values of answers: 1 = Roman Catholic; 2 = Greek Catholic; 3 = Reformed; 4 = Evangelical; 5 = Other Religions; 6 = Non Religious)
- d) What percentage of the lessons did they visit a week? (Values of responses: 1 = 0–20%; 2 = 21–40%; 3 = 41–60%; 4 = 61–80%; 5 = 81–100%).

2.2. Statistical analysis

In the case of continuous data, the questionnaire was evaluated and the major parameters were determined by descriptive statistical methods. In the investigation contingency tables were used and the independence of the variables was established by a Chi-square test and a measure of the association, respectively. For the comparison of the Continuous Persistence Variable between the two groups, the independent two-sample t-test was used and to express the intensity of the effect, the value of Cohend/Hedges-g was calculated.

For the development of the *persistence model,* the GLZ (Generalized Linear Model) model was used, which is suitable for linear modelling of mixed-scale variables. Among the X explanatory variables, quantitative variables, such as age of students, and factors, like gender, may be included. In addition to the normal distribution, in the generalised linear model, for the distribution of the dependent variables, assumption of the binomial and Poisson distribution belonging to the family of the exponential distribution is the most common. By its help, the explained (persistence values) and the predictor variables (independent variables) can be markedly determined.

By means of a cluster analysis, out of significant predictor variables, student groups were formed, which helps to assess students' learning outcomes. The cluster analysis is an explorative analysis that tries to identify structures within the data. More specifically, it tries to identify homogeneous groups of participants.

$P < 0.05$ value was regarded as significant. The analysis was carried out with IBM SPSS Statistics 23.0 (SPSS, Chicago, IL) program and Statistica 13.2 program (Dell Inc. Tulsa, USA).

3. Results

3.1. Association measures

In the following, the statistical data of persistence values of the variables relevant to the research are presented:

Table 1
Data of persistence values of the two university faculties

Code of the faculty	Gender	Mean	Standard deviation	N
Budapest	Mail	7.46	0.87	18[*]
	Female	7.34	1.08	80[*]
	Total	7.35	1.06	98[*]
Debrecen	Male	7.22	1.11	13[*]
	Female	7.06	1.33	89[*]
	Total	7.09	1.29	102[*]
Total	Male	7.32	1.01	31[**]
	Female	7.21	1.21	169[**]
	Total	7.23	1.18	200[**]

[*]: $p = 0.121$; [**]: $p = 0.634$

There was no significant difference in the values of variables between the two faculties ($p = 0.121$, Cohen-d = 0.2202) and no difference was found between the genders, either ($p = 0.634$, Hedges-g = 0.0930).

Table 2
Data of persistence values on paid private lessons

Did he/she take paid private lessons during secondary school?	N	Mean	Standard deviation
No	38	6.79	1.51
Yes	162	7.33	1.07

The difference between the answers was significant ($p = 0.043$, Hedges-g = 0.4635), so the previous, extra investment in learning, mainly by the family of the student, increases the persistence

Table 3
Data of persistence values on the specialisation

Did he/she take paid private lessons during secondary school?	N	Mean	Standard Standard deviation
No	77	6.96	1.23
Yes	123	7.31	1.15

The difference between the two groups was significant (p = 0.042, Hedges-g = 0.2962), so the one who failed to get into the place marked in the first place, can be characterised by a lower persistence and could be more easily at risk, whereas, obtaining the preferred choice increases the fact of persistence**.**

Table 4
The distribution of persistence values according to the religiousness of the parents

Religiousness of the parents	N	Mean	Standard deviation
Not religious	29	6.77	1.21
Religious	171	7.25	1.18

The difference between the two groups was significant (p = 0.044, Hedges-g = 0.4053). The children of religious parents are more persistent, the regulating-orienting effect of religiousness and the values and norms accepted by everybody within the religious network may spur them to a higher degree of performance (25).

From the answers given to the question: *How many lessons did you attend in an average week?* Two groups were formed: *Less active participants* (< 80% of attended lessons), *Active participants* (> 80% of attended lessons) and persistence was evaluated according to these groups.

Table 5
Persistence values reflected by the attendance of the lessons

Groups	N	Mean	Standard deviation
Less active participants	80	6.45	1.28
Active participants	120	7.74	0.76

The difference between the two groups is significant (p < 0.001, Hedges-g = 1.2894), the persistence values of the 'Active participants' are markedly higher.

3.1.1. Investigation of variables between the two institutions/universities

Table 6
Statistical data of the aggregated predictor variables of the two institutions

Variables	Budapest (N=98)		Debrecen (N=102)		Total		p
	Mean	Standard d.	Mean	Standard d.	Mean	Standard d.	
Community membership	26.64	2.08	26.72	2.13	26.68	2.11	0.782
Mother's occupation	7.27	1.03	6.73	1.11	6.99	1.10	< 0.001*
Additional scores	8.44	0.63	7.93	0.98	8.18	0.86	< 0.001*
Views on sports	7.69	1.22	7.42	1.16	7.56	1.19	0.11
Friends outside the university	9.51	1.73	10.43	1.79	9.98	1.82	< 0.001*
Spending free time	13.69	1.87	10.58	2.63	12.11	2.77	< 0.001*
Academic norms	25.91	5.11	23.57	3.28	24.72	4.42	< 0.001*
Use of the Internet	24.54	4.33	22.47	3.50	23.49	4.06	< 0.001*
Doing volunteer work	2.50	0.79	3.90	0.83	3.22	1.07	< 0.001*

3.1.2. Conclusions based on the Table 6

Community membership   *There is no significant difference* between the students of the two universities in assessing the importance of social relations.

Mother's occupation   In Budapest, the value pertaining to occupation is significantly higher, which means that parents *usually have a higher level* of education here.

Additional scores   The average value of the extra scores brought for the entrance examination is significantly higher, which means that *Budapest students acquired a higher number of additional points/scores.*

Views on sports   The students of the two universities share *the same opinion* about the benefits of sports.

Friend outside the university	It is significantly characteristic of the students of *Debrecen* university that they tend *to seek relationships* with friends outside the university.
Spending free time	It is significantly characteristic of Budapest students that they willingly seek friends from both groups (at the university and outside the university) to spend their free time with.
Academic norms	*Budapest students tend to accept academic norms more, i.e. in a significant way.*
Use of the Internet	*Budapest* students use the Internet significantly *more intensively.*
Doing volunteer work	Regular volunteer work is significantly *characteristic of Debrecen* students.

3.2. Persistency model

Significant student factors (variables) based on the developed GLZ model, which influence the persistence values, are:

Table 7
Predictor variables

Significant variables	Value of B regression coefficient	Wald statistics	p
Did he/she attended paid private lessons during secondary school?	0.519	7.491	0.006*
Marked specialisation in the first place	0.257	3.059	0.046*
Religiousness of parents	0.919	5.654	0.017*
Attendance of the lessons	1.149	71.244	< 0.001*
Community membership	0.074	3.549	0.056
Mother's occupation	0.139	3.322	0.068
Additional scores	0.212	4.683	0.030*
Views on sports	0.112	2.638	0.091
Friends outside the university	0.098	5.112	0.024*
Spending free time	0.092	7.995	0.005*

Academic norms	0.065	13.134	< 0.001[*]
Use of the Internet	−0.045	5.290	0.021[*]
Doing volunteer work	0.167	3.038	0.081

[*]: significant relation at p < 0.05 value

Table 8
Omnibus test

Likelihood Ratio Chi-Square	df	p
115.688	13	0.000

Omnibus test is significant (p < 0.001), which shows the effect of explaining variables, the appropriate fitting of the model.

3.3. Hierarchical clustering

In order to classify students as disaggregated but individually homogeneous groups with the help of significant regression variables, a hierarchical cluster analysis was performed because this clustering method is the most suitable one for our data base with regard to the sample size or outlier values. Hierarchical cluster is the most common method, it generates a series of models with cluster solutions from *1* (all cases in one cluster) to *n* (all cases are an individual cluster).

If the variables involved in cluster analysis are at different levels of measurement, and the individual ranges show significant differences, it greatly distorts the cluster analysis result. In such cases variables should be transformed into equivalent scales to make our variables comparable. There are several options for this, either by logging the variable or by standardising. We have used the latter procedure.

Within the cluster method we have adapted the amalgamation (linkage) rule=Ward's method and distance measure=Euclidean distances. The dendrogram (*Figure 1*) shows the different clusters:
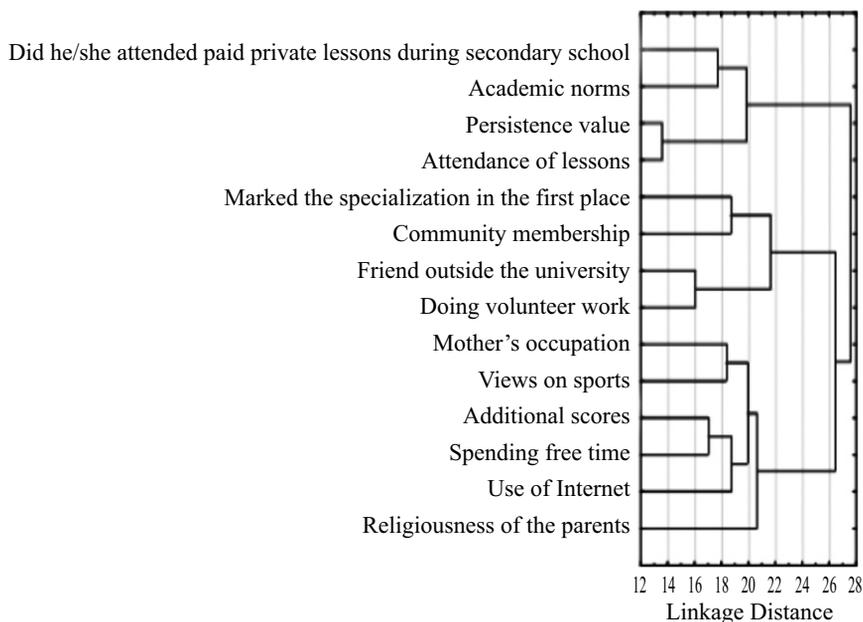
Figure 1
Dendrogram

We have got three clusters on the basis of the dendrogram and the following denominations were used for clusters:

Cluster 1 (Persistency): the group contains students whose persistence is a strong characteristic feature: this is reflected in the appearance of the *Persistence value* variable in the group and the appearance of related variables, for example the *Attendance of the lessons* variable, which is united with persistence at the lowest level.

Cluster 2 (Dating): the companion is a characteristic of the group, the desire for the community, a good example of which is the use of the *Community membership* or *Friend outside the university* variables. It is likely that the *Marked specialisation in the first place* variable will appear in this group as the student wants to belong to the chosen vocational community.

Cluster 3 (Joint characteristics group): the main characteristic of the group is difficult to define and it is also difficult to name the cluster on the basis of the fact that it has several interesting but distinct features on its own but the influence of religion can be assumed as it involves a cluster of these students.

By completing clustering at the universities (Semmelweis and Debrecen) we have got the same result as the combined data presented above, which verifies the stability of our clusters.

Merging cluster 2 and cluster 3 groups into a group is justified by their similarity. Interestingly, cluster 1 merges with cluster 2 and cluster 3 groups at the very end.

4. Discussion

Based on the above, the persistence regression model can be defined and the prediction variables affecting persistence may also be identified. The main findings of the study can be briefly summarised as follows with regard to the significant variables:

a) *Paid private lessons during secondary school:* it shows that the determination and the goal of getting into the university and the sacrifice made by the family for achieving this goal also exerts a positive effect on the student's perseverance.

b) *Marked in the first place:* the negative sign of the coefficient indicates that the choice of students is unclear, there is a significant number of people, for whom this was not really the course they wanted to come to. There are several people who applied for the faculty of general medicine, and marked it in the first place but yet they came to the faculty of Health Care Organisation as a second option. Many of these students will try to take an entrance examination to the medical faculty again at the end of the first year. This may explain the reduction of variables against persistence values.

c) *Religiousness of the parents*: a religious family background is undoubtedly a positive factor in enhancing students' perseverance.

d) *Attendance at the lessons:* the ratio of participating in the lessons has an effect on the value of persistence. The sign of the coefficient shows that the value of persistence is increasing in case of the *'Active participants'* students (TINTO 1997).

e) *Community membership:* active participation in communities reinforces persistence and has favourable effect on student's perseverance (TINTO 1997).

f) *Mother's occupation:* interestingly, the mother's occupation has a positive impact on student persistence, the higher the mother's education is the more it enhances perseverance (TORRES & SOLLBERG 2001).

g) *Additional scores:* students with additional scores brought from secondary school have better persistence values.

h) *Views on sports: although not in a significant way, but views on sport have a positive impact on persistence value.*

i) *Friends outside the university:* friends (friendship) outside the university has a significant effect on the persistence of the student. The reason for this may be that the student has not made friends at the university yet, so the so called 'brought' relations are important.

j) *Spending free time: the results are similar to those of friends outside the university.*

k) *Academic norms:* accepting the academic norms increases persistence (HEUSER 2007).

    l) Use of the Internet: in the case of students regularly using the Internet persist-
        ence decreases, the Internet counteracts on persistence, since it is typically
        used chatting, playing and for other fun activities.
    m) Doing volunteer work: increases persistence values (Heuser 2007).

Through cluster analysis we have got three homogeneous student groups that
further help to understand the composition and behaviour of the student community.

5. Conclusion

The aim of the present study was to investigate in a non-representative sample of
first-year students of healthcare organising, how much the persistence values indis-
pensable for successful studies are present in their lives, what factors affect these val-
ues and what student groups can be formed out of the important variables at the ini-
tial phase of the students' professional studies. The knowledge of these variables can
be a key to successful studies and obtaining a diploma.

By performing cluster analysis, the cluster groups *(Persistency, Dating, Joint
characteristics group)* were created from regression predictor variables by which stu-
dents could be classified to assess their learning outcomes.

In our opinion, it would be worthwhile to survey at each faculty to what extent
the present teaching and educational facilities support learning needs of students with
different 'persistence values' and the information obtained could be used to produce
operative strategies and to develop the already existing ones.

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