

The role of intergenerational social capital in diminishing student attrition

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(Received: July 9, 2018; accepted: September 25, 2018)

Background and aims: Higher education was reformed through the Bologna Process with the hope that an increasing number of students will get a degree faster than before due to the short cycle of bachelor's programs. However, the change in structure has not reduced student attrition in Western Europe. Even in the 2010s, understanding the phenomenon of attrition is one of the most significant challenges in higher education research. In Hungary, almost two fifths of bachelor's students and one fifth of master's students leave higher education without earning a degree.

Methods: When examining student attrition, we may use data on institutions or individuals. Institutional data reveal the proportion of those who continue their studies without interruption (retention), while data on the individual level allow the investigation of students' expectations about their own chances of getting a degree (persistence).

Results: By comparing attrition rates among those who pursued higher education in 2010 and 2014 at different faculties (data from the Higher Education Information System – FIR) with data from a regional student survey (IESA database), we have found that faculties with high retention rates also demonstrate a large proportion of self-reported persistent students. Furthermore, we have explored the effect of individual traits (demographic characteristics and socioeconomic status), institutional factors (size, selectivity, maintainer, and prestige), and embeddedness (multiplexity and strength of different social networks) on student persistence. *Conclusion:* We have shown that institutional factors and embeddedness have a more significant impact than demographic and social characteristics, which individuals have before entering higher education.

Keywords: persistence; student attrition; higher education

POSSIBLE APPROACHES TOWARD STUDENT ATTRITION

In connection with our research on the indicators and underlying causes of student efficiency in a Central and Eastern European cross-border region, it has come to our attention that the international literature offers no consensus on the definition and appropriate measurement of student efficiency. In our studies, we have argued that student efficiency is best measured by complex indicators, which consist of predictors of long-run achievements (Pusztai, 2017). However, most international researchers approach the question from a negative perspective: they investigate student inefficiency, attrition, dropping out, student departure, non-completion, or disillusion with education goals or the institution. Higher education was reformed through the Bologna Process with the hope that an increasing number of students will get a degree faster than before due to the short cycle of bachelor's programs (Pusztai & Szabó, 2008). Nevertheless, the change in structure has not reduced student attrition (Kehm, 2014; Wolter, Diem, & Messer, 2014). It is worthwhile to investigate the patterns of student attrition between entry and graduation in Hungary as well, since statistics show that two fifths of bachelor's students, one fifth of master's students, and half of doctoral students leave higher education without earning their degree (Derényi, 2015;

Pusztai, 2009). Neighbouring countries also exhibit a large proportion of higher education dropouts (Hatos & Pop, 2013). This study contributes to the line of research in which the predictive factors of student attrition are searched for and the interconnected effects of student persistence are examined. First, we explore the possible approaches toward the phenomena of retention and persistence, then we provide an overview of explanatory models and finally, we present our analysis.

The definition and measurement of student retention and persistence vary on different levels of analysis substantially, with some studies even using the two terms interchangeably. A possible aspect of investigating student attrition is the institutional perspective. The term “retention” is frequently used when the continuation rate of a student cohort or the ratio between graduated and admitted students is discussed (Mortenson, 2012). When examining retention, it is vital to create ratios from compatible data, that is, one must compare groups of students in a certain field or at a given institution who started their studies at the same time. Statistical databases that are available on non-continuation of higher

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studies in Hungary identify multiple scenarios: students decide to terminate their studies themselves, they do not meet academic or examination criteria, they are unable to cover tuition and other expenses, or discontinue their studies due to medical reasons (Fenyves et al., 2017). The scenarios, however, do not reveal the actual circumstances of attrition in detail.

There is a broad spectrum between the uninterrupted path toward a degree in higher education and typical attrition, which leaves one without a degree. Early studies on the topic focused on voluntary non-completion, and did not account for students dismissed due to academic and behavioral–ethical reasons. Therefore, attrition included only those who decided to terminate their studies voluntarily (Tinto, 1975). Attrition might also be approached by examining students who have grown hesitant about the continuation of their studies as they are in permanent awareness of everyday experiences and interactions, which may steer them toward retention or departure (Tinto, 1993).

In the literature, we find some panel studies. Tinto's attrition model, proposed in the 70s, was first tested at a large university with 10,000 bachelor's students by following 1,500 freshmen, of whom some 800 responded a year later, with about one tenth dropping out (Pascarella & Terenzini, 1980; Tinto, 1975). Panel studies outside higher education have also been attempted by following cohorts of secondary school students (Sciarra, Seirup, & Sposato, 2016). These studies always face the crucial problem that as time progresses, the number of those who do not respond grows higher. To circumvent falling response rates, researchers often look for indicators, which can also be used in cross-sectional analysis. These include the perception of academic challenges in higher education, a related indicator: commitment to one's studies, and data on the time and effort devoted toward studying (Astin, 1993). It seems that expectations on the successful completion of studies are closely connected to decisions and behavior as a student. Thus, in this study, we consider students persistent, if they are determined to complete their education.

Higher education socialization and student persistence

Higher education research does not always consider the quality and quantity of relationships, which influence the institutional effectiveness of education the most. The heterogeneity of the student body, however, has focused attention on the socialization processes in higher education, which is defined by the entry into the gravitational field of the social network at the higher education institution and by growing somewhat distant from external social networks (Tinto, 1975, 1993). There seems to be a consensus that attrition follows from unsuccessful student socialization (Heublein, 2014). Based on previous analyses, we differentiate between reconstructive and constructivist approaches of student socialization in the model frameworks of institutional socialization in higher education (Pusztai, 2015). Whereas reconstructive views focus on the transmission of a certain culture in higher education, during which students, voluntarily or not, obey macrostructures that exist independently from them, the constructivist approach underlines that higher education operates in an environment in which

actors shape others' and their own beliefs actively (Pusztai, 2015; Somlai, 1997).

According to a version of the reconstructive view, the improvement in knowledge and competencies, and the steps toward becoming a professional can be planned precisely (Szczepanski, 1969; Weidman & Stein, 2003). Critical theories of socialization argue that uninterrupted continuation of higher education is determined by socially dominant inequalities and the socioeconomic status of the family (Ceglédi, Tóbi, & Harsányi, 2016; Reay, Crozier, & Clayton, 2009). This implies that differences in student persistence arise from status inequality, similarly to the achieved level of competence and the variation in previous school efficiency. The critical approach suggests that a poor decision about a higher education program, which leads to early departure, is partly due to the lack of appropriate professional orientation, which is based on the realities of the socioeconomic environment and the actual possibilities offered by higher education (Nakajima, Dembo, & Mossler, 2012).

By contrast, the constructivist approach stresses that student groups are active participants in the formation of what higher education means to them. Constructivist analyses on higher education focus on discursivity by pointing out the momentary and unique nature of mutual reflection (Huber, 1991). In the analysis of higher education processes, it might be more appropriate to turn to another version of the constructivist perspective, which highlights the importance of students' contextual communities in which they become embedded (Pusztai, 2015).

Differences between degree programs and fields can be observed regardless of their social base of mobilization. In each field, high admission requirements and favorable placement opportunities increase the proportion of persistent students (French, Immekus, & Oakes, 2005; Ulriksen, Madsen, & Holmegaard, 2017). Professional identity, disciplinary values, and strong ties to social networks also seem to explain persistence (Ulriksen et al., 2017).

Strong ties to academic and social networks have also been shown to exert an effect in the earliest study on attrition, which has revealed a connection between determination to complete a degree and attachment to the institution (Tinto, 1993). This explanatory model suggests that those who have an above average risk of attrition cannot be identified before entry, since social attachment is the key factor: until students grow distant from the communities, which were important to them before higher education, they are not able to integrate into their higher education institution. Influential studies have since confirmed Tinto's integration theory (Astin, 1993; Pascarella & Terenzini, 2005).

Some researchers characterize the resources from the student's relationships as social capital (Altbach, 2009; Kim & Schneider, 2005; Perna & Titus, 2005). In our previous studies, we showed the strong connection between attachment to social networks, the direction and strength of ties, the multiplexity of relationships, and the interpretations, which impact students' higher education activities. Consequently, we introduced the concept of student embeddedness to analyze students' institutional relations systematically (Pusztai, 2015). As in the literature, we made

a distinction between externally and internally attractive relationships.

As we have established, it is very important that lecturers and professors should be available outside the lecture hall and the possibility of constant communication with them should exist. An influential factor is the perception of fellow students' commitment, that is, to what extent they consider it necessary to engage in academic activities and take part in the campus community (Pusztai, 2015; Sciarra et al., 2016). While international studies have revealed the diminishing effect of strong intragenerational ties among students on attrition, the first cohorts in the changed structure of Hungarian higher education after the Bologna Process exhibit lower efficiency when embedded in the campus community (Pusztai, 2015).

External intergenerational relationships should also be considered. At the turn of the millennium, it was proposed that certain student groups might achieve their academic goals due to the notification or even inclusion of parents (Tierney, 2000). Parents can be involved in many ways, not only as donors but also as a target group for family events and parental clubs. At universities in the United States, parent relations offices inform them and organize activities for them. The literature also considers parents as a key interest group (Wartman & Savage, 2015). Impact assessments about institutional programs include parents regarding them as active partners in their child's higher educational development and in the preparation of a successful graduation. Parents maintain an increasingly direct relationship with universities and colleges, and could even be involved in trainings, which prepare and support their child's higher education participation. Previously, parents' support and involvement were considered as unwanted intervention, which hinders the process of becoming independent, but recent research suggests that they might contribute to students' commitment to their studies (Barefoot, 2004; Braxton, 2000; Perna & Titus, 2005; Wartman & Savage, 2015; Wolf, Sax, & Harper, 2009).

HYPOTHESES AND VARIABLES

Our research question is the following: what is the effect of the strength and multiplexity of intraorganizational and extraorganizational, intergenerational, and intragenerational relationships on students' perseverance with academic goals, and how stable is this effect with varied demographic, social, and institutional characteristics? Our hypotheses refer to the relationships between family status, institutional characteristics, students' embeddedness in the social network, and persistence. We hypothesize that basic indicators of social status, in particular, parents' level of education impacts students' perseverance with their studies the most as it can be well utilized in education institutions. In accordance with international literature, we expect that institutions with flexible requirements and programs to aid the progress of the disadvantaged have more persistent students (Heublein, 2014). This implies that strict and selective institutions have a lower proportion of persistent students.

Based on our previous findings, we also assume that the student integration theory, which is widely discussed and

corroborated in the literature, cannot be considered a homogenous phenomenon in the social context of higher education. We argue that embeddedness in intergenerational and intragenerational social networks based on the poles of the intra–extra campus axis affects students' higher education persistence differently. We hypothesize that close, intraorganizational, and intragenerational ties increase the perseverance of lower-educated parents' children, whereas children of higher-educated parents, who speak the same language with teachers, establish internal, intergenerational relationships, which can enhance their perseverance. In other words, we expect the direction of social networks to differ by the parents' level of education.

Extraorganizational and intergenerational ties refer to the relationships between students and parents. As high-educated parents' children are endowed with contacts, which bear a relevance to higher education, we expect parents' high level of education, strong extraorganizational and intergenerational embeddedness, and substantial student persistence to correlate. With respect to strong, extraorganizational, and intragenerational ties, we presume that children of parents with a low level of education have fewer relationships within their generation, and even those connections are mainly directed toward socially homogeneous groups. This suggests that their relationships might lack an intellectual factor, which could hinder their perseverance with their studies.

Our analysis is based on the Institutional Effect on Students' Achievement in Higher Education (IESA) database, which was created in 2015. Its detailed description can be found in a book with our previous research findings (Pusztai, Bocsi, & Ceglédi, 2016). The database contains data from 2017 students at 13 higher education institutions of five countries in the Carpathian Basin. We have compared data from Romanian, Ukrainian, Serbian, and Slovakian higher education institutions and faculties, which offer courses in Hungarian with Eastern Hungarian institutions, as the latter are similar to the former as regards the share of underprivileged students.

We have investigated persistence using the Likert scale, which has nine items in two blocs. The first bloc summarizes commitment to graduate, conviction about the benefits of studies, determination to achieve the best possible results, and the strength of intent to participate in academic activities. The second bloc comprises self-confidence to take on and complete different forms of academic activities, and confidence about time management, and the ability to concentrate on one task. The scale of persistence has a high reliability measure (Cronbach's $\alpha = .921$). We have conducted principal component analysis of the nine variables, which has yielded an explained variance of 61.4%.

In this analysis, we have divided social networks into four segments, and have compared the strength of relationships within and outside the institution (intraorganizational and extraorganizational) as well as of intergenerational and intragenerational ties. The reliability measure of the scale of intraorganizational and intergenerational relationships is high (Cronbach's $\alpha = .835$). Principal component analysis of the eight variables has resulted in an explained variance of 68.7%. When principal component analysis has been conducted on a bloc of 11 variables with high Cronbach's α (.847), about 59.8% of the variance has been explained,

which is an acceptable value. The questions about extra-organizational and intragenerational relationships have a Cronbach's α of .888. Principal component analysis on the 12 variables has shown that 58.7% of the variance can be explained. The strength of extraorganizational and intergenerational ties, that is, the content and strength of contact with parents have been measured on a 12-item ordinal scale. The items refer to various forms of contact: doing chores together, parents' interest in their child's studies, motivating to study, contact with the students' partners at the institution, donations, activities together, and finally, students' conversations with their parents about general topics, culture, politics, public affairs, books, films, career choices, and leisure activities. The scale that describes the strength of parent-student relationships has a high reliability measure (Cronbach's $\alpha = .886$). We have conducted principal component analysis of the 12 variables, which has yielded an explained variance of 58.9%. All variables have been standardized, and have been used both as continuous and binary variables (under or above the mean). It has been revealed that strong, intraorganizational, and intragenerational relationships are the most frequent, whereas intraorganizational and intergenerational ties are rare. To examine the connections between basic demographic and social status indicators on the institutional and individual level, we have first employed binary analyses (contingency analysis and comparing means), and then multistep logistic regression analysis.

Facts about attrition and student persistence

We have compared actual data of discontinued studies at faculties of an Eastern Hungarian university with the scale we have created to predict attrition risk. The Higher Education Information System (FIR) contains data for 2010 and 2014 on the institutional level, which we have used to examine the ratios of graduations and discontinued studies. This has allowed us to create a ranking based on attrition risk. We have compared the ranking with higher education persistence indicators from our 2015 survey study. Data from FIR suggest that few faculties exhibit a non-completion rate below 25% steadily over time. The same faculties are the ones in the 2015 survey data with 80% or more students who are convinced about the usefulness of their studies in their careers, are determined to graduate, wish to achieve the best possible results and to take a great number of courses, claim that they are able to meet deadlines and to postpone leisure activities to concentrate on studying and lectures. Based on the survey, faculties with high attrition rates tend to have fewer persistent students.

According to the 2015 survey data, about one eighth of respondents (13%) have discontinued their degree program before. Three quarters of them are first-year or second-year students, that is, they are at the beginning of a new program. Of the 13%, three quarters have departed from their bachelor's studies, with two thirds studying in another bachelor's program. At certain faculties and in some regions, it is often students whose parents have a high level of education who discontinue their studies, suggesting that the parents' high level of education does not imply low attrition rates automatically. It is important to note that having graduated once

does not necessarily indicate persistence, although those who have discontinued their studies are less persistent than average, which means that they have a significant chance of non-completion again. In their analysis of data over multiple decades, Wolter et al. (2014) have reached similar findings. Consequently, it is worthwhile to investigate the factors that support students to become persistent in their studies.

Becoming persistent and background variables

Among the variable groups that we examined, individual-level student attributes do not seem to be connected to persistence to a large extent. Perseverance with academic goals does not correlate significantly with important efficiency determinants, such as parents' level of education, objective, relative, and subjective financial situation, vocational secondary school, or maintainer of secondary school. Institutional variables seem to exert a much more significant impact. It can be shown, however, that there are more types of institutional environments, which benefit persistence. Institutions with a higher student count and greater academic achievements, as well as church-run universities strengthen the determination to graduate. This suggests that widely popular faculties of great prestige and institutional environments built around culture have a higher proportion of persistent students. By contrast, strong selectivity does not seem to encourage students to become persistent.

Besides institutional characteristics, the ambiguity described above may also result indirectly from factors of student embeddedness in social networks. This presumption is reinforced by the fact that two individual factors, which influence persistence, namely place of residence in a large town and accommodation in a student dormitory, suggest proximity to the institutions in terms of location and social networks. Similarly to efficiency, female students' persistence seems to be stable (Table 1).

According to previous multivariate analyses, the mechanism through which institutions can exert an influence includes the quantity, quality, and value-transferring function of student connections within the institution, which has been shown in a comprehensive review of international literature findings (Pascarella & Terenzini, 2005) and in a study based on Hungarian data, as well (Pusztai, 2015). Based on our previous work on student embeddedness and the most popular concept of higher education attrition, namely Tinto's student integration theory, we have investigated the effects of student embeddedness in social networks on persistence indicators, which are predictive of student attrition, along intergenerational or intraorganizational and intraorganizational or extraorganizational axes.

THE IMPACT OF INDIVIDUAL AND EMBEDDEDNESS FACTORS ON STUDENT PERSISTENCE

In our analysis, we have attempted to show the impact of institutional, individual, and embeddedness indicators on student persistence. We have analyzed the chance of becoming persistent in models, which control for the simultaneous effect of different variables, and have calculated

Table 1. The relationship between becoming an above average persistent student and basic variables

	Attribute that strengthens student persistence the most	Significance χ^2 /ANOVA
<i>Institution attributes</i>		
Size	Higher student count	0.003
Maintainer	Church-run	0.004
Strong selectivity	–	NS
Excellence of lecturers	Great academic achievements	0.000
Minority/majority higher education	Majority institution	0.000
<i>Student attributes</i>		
Gender	Female	0.000
Father's level of education	–	NS
Mother's level of education	–	NS
Financial situation (objective, relative, and subjective)	–	NS
Place of residence	Large town	0.032
Accommodation during the academic year	Student dormitory	0.037
Organization membership	Not a member	0.000
Vocational secondary school	–	NS
Maintainer of secondary school	–	NS

Note. Source: IESA student survey performed in 2015. ANOVA: analysis of variance.

estimates. Variable groups have been included in our logistic regression models in four steps. In the first step, we have examined institutional characteristics, which all affect student persistence positively: students are more persistent if they attend institutions with a higher student count and great research achievements, and if they study at selective or church-run faculties. Including gender and socioeconomic status, indicators in the model has eliminated the significance of the maintainer, while the inclusion of residence and previous school experience has caused the previously significant effect of research achievements to disappear. On the contrary, the impact of size and selectivity has remained

significant, with increasing coefficients in some cases. This suggests that it is students at remarkably selective institutions with high admission requirements who are most determined to graduate successfully. In all specifications, female students are significantly more persistent than their male peers. In this multivariate analysis, parents' level of education does not seem to influence student persistence, whereas a beneficial financial situation has a significant adverse effect on it. Perseverance with academic goals is not affected by dormitory accommodation during the academic year, place of residence, and previous education environment. With regard to institutional connections,

Table 2. The impact of institutional, individual, and embeddedness indicators on student persistence

	1	2	3	4
Size	1.257**	1.335***	1.217**	1.220**
Selectivity	1.927**	2.182**	2.290**	2.462**
Maintainer	2.263**	1.913**	1.570	1.431
Research achievements	1.373**	1.254	1.191	1.136
Gender		0.490***	0.487***	0.553***
Father's level of education		0.945	0.951	0.947
Mother's level of education		1.006	0.996	0.938
Financial situation tertiles		0.838**	0.841**	0.802**
Place of residence			1.089	1.127
Accommodation during the academic year			1.208	1.183
Vocational secondary school			1.064	1.074
Maintainer of secondary school			0.989	1.010
Intraorganizational and volunteering			0.754**	0.731**
Intraorganizational and intergenerational				1.577***
Intraorganizational and intragenerational				1.170
Extraorganizational and intragenerational				1.090
Extraorganizational and intergenerational				1.962***
Intercept	0.629***	1.058	1.120	0.557
–2LL	1.4	3.4	3.9	6.9

Note. Source: IESA student survey performed in 2015. The fit of models is indicated by the decrease of –2* loglikelihood (2LL) value in percentage terms.

*** $p = .000$. ** $p < .03$. * $p < .05$.

participation in intraorganizational volunteer groups decreases, whereas intergenerational ties increase the likelihood of becoming persistent among students. In our previous studies, we already established the positive effects of intergenerational social embeddedness, but now it has been shown for the first time that parents' involvement in various dimensions also has a significant impact (Table 2).

CONCLUSIONS

This study contributes to research on the complex phenomenon of student attrition. Our analysis has reassured that attrition and uncertain student persistence are a relevant focus for research. Our data show that those who have discontinued a degree program in the past are less persistent than the average, that is, they have a significant chance of non-completion again. To predict successful completion of higher education studies, we have been using our own questionnaire since 2012. We have measured student persistence on a 9-item Likert scale, with standardized and binary variables. We have shown that faculty-level ratios of discontinued studies negatively correlate with the persistence scale, which we have created to capture perseverance with higher education studies. We have also explored the reasons as to why a student becomes persistent. Our explanations have included bivariate analysis with institutional characteristics, individual-level demographic and social indicators, social network factors, as well as multivariate logistic regression models. Our findings have revealed that factors in connection with the institutions and social networks have a larger, more significant impact than individual indicators. Contrary to expectations, selective institutions have a higher proportion of students who are eager to complete their studies successfully, possibly motivated by the high prestige of their field and profession in the future. Female students are more committed to academic goals. This finding is not unprecedented in the Hungarian and international literature: some have even suggested that the entry of women into higher education in the 1970's caused the trend of falling attrition rates (Engler, 2013; Fényes, 2010; Wolter et al., 2014). The phenomenon is often attributed to social expectations toward women and family norms, but the explanation may also include females' more advanced ability to make contacts.

It is clear that student persistence is reinforced by strong, multiplex relationships with lecturers and professors. Even more pronounced is the effect of the relationship with parents. In accordance with recent international literature, we note that normative judgment in this matter should be avoided. With higher education becoming more impersonal, formal, and extensive, which leaves the need for stable social support unsatisfied, the importance of close and complex student-parent relationships is likely to be substantial.

It seems that students' favorable financial background hinders their persistence instead of enhancing it. Students who are better off than the average may not feel the need to use higher education as a path to achieve high status. Multivariate analyses have revealed that intraorganizational and extraorganizational volunteer work and group membership do not exert a significant effect. The impact of

participating in intragenerational social networks on student persistence requires further analysis.

Our findings suggest that it might be worthwhile to consider adapting policies of higher education institutions to current circumstances. Besides ensuring multidimensional and varied support for students by lecturers and professors, establishing and maintaining a system of services for parents might also improve student persistence.

Funding sources: Project no. 123847 has been implemented with the support provided from the National Research, Development and Innovation Fund of Hungary, financed under the K_17 funding scheme.

Author's contribution: The author has full access to the references included in this analysis and takes responsibility for the integrity and accuracy of the study.

Conflict of interest: The author declares no conflict of interest.

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