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THE INVESTIGATION OF EDUCATIONAL RESILIENCE AMONG 4TH AND 6TH GRADE STUDENTS BASED ON MULTI-PERSPECTIVE APPROACH

Summary of the Ph. D dissertation

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Subject and Structure of the Dissertation

In the past few decades, the number of research focusing on students who achieve high at school despite their adverse circumstances has increased. The literature calls this phenomenon educational resilience, and calls children performing well despite their disadvantaged socioeconomic background resilient students. Research on educational resilience is mainly focused on socially and economically disadvantaged students. The scope of research has a different approach to the study of disadvantaged students, especially as it focuses on a group of such students who perform better than their hindering background would suggest (Prince-Embury, 2014). Studying resilient students may highlight personal and environmental protective factors important in achieving at school, that if developed, may contribute to closing the gap in the cases of children from the marginalised social stratum.

However, little is still known about the phenomenon in Hungary. The implementation of research and confirmation of international results in the Hungarian context is therefore necessary. Based on that, while implementing the research presented in this dissertation, our wider target is to increase knowledge in Hungary about the protective factors that contribute to educational resilience.

Our research had two narrower main objectives. On the one hand, we aimed at developing and trying a multi-perspective approach which diversely covers the identification of resilient students. The approach was created by the inconsistency in the phenomenon's interpretation and the inconsistency in the method of identifying resilient students (Lerner, 2006). Various types of research on educational resilience have major differences in how they define the basic criteria of the phenomenon, and how they examine its components. However, research stemming from the varied types of conceptualisation, and aiming at problems of validation was not considered during this research. The question, therefore, may arise how results containing various resilient students' samples could at all be standardised. To reply to this question, we created a multi-perspective approach that is founded on both educational and psychological resilience research. The aim of this approach is to use variables and methods based on different aspects on the same sample, to compare the ratio and characteristics of resilient students.

The other main aim of our research was the examination of protective factors. Data was collected on the importance of personal and environmental factors in the Hungarian context among 4th and 6th grade students. As no suitable instrument was available, development of a student questionnaire and the investigation of its applicability was also part of our research. The resulting Resilience in School Questionnaire, once improved, may become an instrument suitable for regular use. By means of this questionnaire, schools could explore students' resilience profile as well as the resources of learning groups and the entire school. Results could provide the platform for projects on school development, programmes on dropout prevention of disadvantaged students, and could contribute to the improvement of the dimension of equity of educational effectiveness.

In the dissertation's theoretical background, we indicated the context within which our research (Chapter 1) may fit, then described the definition and interpretation of resilience (Chapter 2) and the possibility of its investigation (Chapter 3). We presented and described the key research results (Chapter 4). Following the review of our project's concept, questions, hypotheses, and methodology (Chapter 5), we presented its results (Chapter 6). In the final, 7th chapter of this paper we summarised the results and highlighted further research opportunities.

Theoretical Background

The sources of the dissertation's theoretical background were the terms that group around educational effectiveness. Out of those terms, equity proved to be especially important in our research. Equity is to create the opportunity to equally access education and learning opportunities for all students (OECD, 2018; Lannert, 2004). It also means a type of active line of action that ensures the access for individuals and groups from unequal backgrounds (Varga, 2013, 2015). Education based on equity means to create a school environment that provides an opportunity for every student to develop their skills and talents best (OECD, 2018; Keller & Mártonfi, 2006), hence receive an efficient and effective education. An education based on equity decreases social differences, moderates tensions created by social situations as it pays extra attention to children from marginalised social strata, and increases the feeling of togetherness (OECD, 2010).

The failure of disadvantaged students is an important issue in general education, yet to be resolved. However, the need to ensure equality as a key educational task is slow to enter public opinion in Hungary. According to international studies, we are at the bottom of the list, showing the indicators of equity (e.g., Csapó, Fejes, Kinyó, & Tóth, 2019; Tóth, Csapó, & Székely, 2010), such as lists analysing selectivity, differences between schools and effect of family background.

Resilience research is a complex field, despite its recent rise. This complexity is largely due to the inconsistence in the term's operationalisation (Lerner, 2006). In the past fifty years there have been numerous interpretations of the term, but a common definition is yet to be agreed on. Hence different types of research created concepts and methods based on the then applied terms. In the relevant parts of this dissertation, we will present the phenomenon's conceptual framework, the methodological possibilities and results of its research.

In psychological literature, some researchers define resilience through the two fundamental judgements of this phenomenon: risk and good developmental outcome (Masten & Coatsworth, 1998). Others, when creating a definition, emphasise the multidimensional side of the phenomenon and highlight the personal and environmental factors that play part in the development of resilience (pl. Ungar, 2008; Sameroff, 2009). Psychological studies provide a wide range of theoretical and empirical foundation for pedagogical research and indicated opportunities to assist the successful studies on students from unfavourable conditions (Wang, Haertel, & Walberg, 1994).

Our understanding is that research and theories on educational resilience are fundamentally no different from the psychological approach, as the two criteria, risk and good developmental outcome appear in both fields, when defining the phenomenon. Although there is still no consensus on a common definition in pedagogical research, in general one can say that it is more focused than psychological resilience research, and centre around students achieving high in their studies (e.g., OECD, 2019; Peng, Lee, Wang, & Walberg, 1991). Due to the relation between the two fields, their results are not necessarily separated, hence psychological results may provide a foundation for planning.

Methods applied during educational resilience research are defined by how risk factors and positive outcome in students' life are defined, due to the interpretation of the phenomenon. There are various interpretations of risk. Most types of research take low socio-economic status and/or being part of a minority group into account, when defining disadvantaged circumstances. Low academic achievement (e.g., Langenkamp, 2010), child maltreatment (e.g., Coohey, Renner, Hua, Zhang, & Whitney, 2010), dropping out of high school (e.g., Wayman, 2002), low confidence in graduating (e.g., Catteral, 1998), and low school commitment (e.g., Li, Martin, Armstrong, & Walker, 2011) also occur.

Different types of data are used to identify positive outcome as well. Some of the research build on cognitive components, others on non-cognitive components. In educational resilience research, measuring cognitive outcome is dominant, most of those utilise the achievement test results to measure success (e.g., Fantuzzo, LeBoeuf, Rouse, & Chen, 2012). Other projects are centred around grades (e.g., Raskauskas, Rubiano, Offen, & Wayland, 2015), expected academic attainment (e.g., Geoke-Morey et al., 2012), satisfaction with academic performance (e.g., Plunkett, Henry, Houltber, Sands, & Abarca-Mortensen, 2008), or other academic, behavioural, and social characteristics (e.g., Farmer, Clemmer, Leung, Goforth, Thompson, Keagy, & Bloucher 2005).

Results and methodology of PISA measurements have outstanding significance in the field. Analysis published by the OECD provided the first representative results at student- and system-level, based on quantitative data about the phenomenon of resilience in education. PISA analysis provides a type of resilience indicator on the given year's key areas and are utilised to describe the equity dimension of different educational systems (e.g., OECD, 2019). The term resilient student is applied in the case of students who achieve high, despite their low socio-economic status.

Analysis that also allow for international comparison show that year-on-year the highest number of resilient students appear in economies of the Asian region (Hong Kong–China, Vietnam, Singapore), while compared to OECD countries Hungary has a low ratio of resilient students and it has not increased significantly over the years (OECD, 2013). The last results highlighted the decrease in the ratio of resilient students (Agasisti, Avvisati, Borgonovi, & Longobardi, 2018).

PISA assessment and other investigations indicated several factors that contribute to the success of resilient children. Finn and Rock (1997) or Fantuzzo and his colleagues (2012) all found a fundamental difference between resilient and non-resilient student when looking into their academic engagement. In connection to motivational components, they highlighted that resilient students have more robust and positive patterns (Gordon Rouse, 2001). Gonzalez and Padilla (1997) discovered that the sense of belonging and the emotional attachment to school predicts resilience. Students' positive attitude, their perceptions about their capability also attribute to compensating a disadvantaged background (e.g., Von Secker, 2004).

Research has also highlighted the importance of factors, such as connection to teachers, parents, and peers, i.e., the family and social connections (Langenkamp, 2010; Plunkett et al., 2008; La Foret, Watt, Diaz, McCullough, & Barrueco, 2000). Individual factors such as self-concept (e.g., Kanevsky, Corke, & Frangkiser, 2007; Wang, Haertel, & Walberg, 1997; Gordon 1996), self-confidence (e.g., Gordon, 1996; Padrón, Waxman, Brown, & Powers, 2000), autonomy (e.g., Wang et al., 1994), self-efficacy (e.g., Raskauskas, et al., 2015; Gordon 1996), self-esteem (e.g., Raskauskas et al., 2015; Padrón et al., 2000), and coping (e.g., Glennie, 2010; Orozco, 2007) have also been analysed and revealed that these factors have an effect on the connection between unfavourable background and academic success.

Research Questions and Hypotheses

The analysed research in this dissertation has five detailed objectives, to which we connected the research questions and hypotheses.

1) The Applicability of the Online Questionnaire

Are instruments adapted to online use suitable to study the age cohorts partaking in the research?

H_1: Based on previous results, we assume that the scales and subscales are acceptable for all age groups. Our hypothesis is that reliability-indices will be sufficient and the applied questionnaires' factor structure is adequate.

2) The Applicability of Multi-perspective Approach, Size and Composition of Resilient Subsamples

When applying the multi-perspective approach, in what ratio do students classified into the successful and resilient categories, in the entire sample and per year? What is the overlap between resilient student subsamples created along different procedures and how does the ratio of resilient students change when different perspectives are applied?

$H_{2,3}$: We assume that the number of successful and resilient students will be the highest when a single-item identification method is applied. With multi-item scales the number will decrease, when achievement test scores are applied the number of resilient students will be even less.

H_4: In the case of European countries taking part in the PISA assessment, a smaller group of students was resilient than non-resilient, only Eastern Asian economies (such as Vietnam 76%, OECD, 2018) presented different results. We therefore assume that in case of any type of identification method, the number of resilient students will be less than non-resilient in a group of disadvantaged students.

H_5: PISA focus on a given year's main field when preparing their resilience-based analysis. However, they also highlighted that resilient students based on their results in Science classified mostly into resilient category in Mathematics and Reading as well (OECD, 2011). Hence, we expect that resilient subsamples identified in different ways will show the same results, subsamples will not be defined by the perspective with which they were identified.

3) Characteristics and Differences of Resilient Subsamples Identified Through the Multi-perspective Approach

How can resilient student groups identified through different methods may be described based on protective factors? What differences could be identified?

H_6: As we could not find research results that focus on comparing resilient student groups identified through various types of approach along the line of protective factors, we relied on null-hypotheses, and assumed that there will be no difference between the resilient samples.

4) Similarities and Differences between Resilient and Non-resilient Students

What differences could be identified between resilient and non-resilient students with similarly disadvantaged background, regarding protective factors included in the research?

H_7: In the context of 'intrapersonal factors', we assume that resilient students' general self-efficacy (e.g., Masten & Wright, 2010) is significantly higher than their non-resilient peers. Out of the coping strategies the optimistic, problem analysing coping strategy will show a much higher average in resilient students (e.g., Glennie, 2010; Orozco, 2007).

H_8: In the category of 'school and study', successful disadvantaged students describe themselves with higher academic self-efficacy (Cheung, 2006; Prince-Embury, 2007), and they consider themselves more persistent (Cassidy, 2006; Wagnild & Young, 1993), relate better to school (Gonzalez & Padilla, 1997), are more motivated in solving school tasks (Gordon Rouse, 2001), and feel that adaptive reaction to everyday set-backs is more typical of them (Glennie, 2010).

H_9: In terms of 'self-regulation and strategies', according to our hypothesis, resilient students have higher self-control than their non-resilient peers. There is a significant difference between the task analysis' self-regulating studying phase. As opposed to non-resilient students, resilient students typically prepare consciously before studying and track their learning procedure as well as analyse the following results. They tend to apply learning strategies (elaborate, memorise, control) more than their unsuccessful peers (Nota, Soresi, & Zimmerman, 2004; Wang et al., 1994)

H_{10}: As for 'environmental factors', we presume that in all subsamples resilient students feel that their peers' and teachers emotional support is stronger, as well as they consider fairer the school environment created by their teachers. They also evaluate their teachers' behaviour as supportive of autonomy (e.g., La Foret et al., 2000; Plunkett et al., 2008).

5) Connection between Protective Factors and Positive Outcome

What is the connection between the protective factors, and what are the relations of the success with these factors?

H_{11}: We expect significant positive correlation between resources involved in the research and variables applied for the identification of positive outcome. We presume this as the non-cognitive components' effect on academic performance and their connections are well documented (e.g., Gutman & Schoon, 2013; Heckman & Rubinstein, 2001). Based on our hypothesis, intrapersonal protective factors (general self-efficacy, coping strategies), school and study factors (academic self-efficacy, effort and persistence in learning, attachment to and motivation at school, coping in school), resources analysed between self-regulation and strategies (self-control, phases of self-regulated learning, learning strategies), environmental protective factors (peer support, teachers' support, justice in school, support of autonomy) have significant connection between each other and the success of students.

Sample and Instruments

In the dissertation we defined educational resilience as a phenomenon, when the success is realized in the field of academic studies and the difficulties, hindering factors stem from the economic and social characteristics of the students' families. We therefore identified students as resilient who, despite their socio-economic background, were successful in their studies. However, we added psychological elements to this approach and included the dimension of emotional well-being in our research. This term is followed by the fact that the two key criteria identifying the phenomenon are disadvantaged background and mostly academic success. To analyse these two criteria, we developed a multi-perspective approach, which enabled us to identify groups of resilient students through different data and along the lines of several key dimensions (test results, subject-specific self-concept, satisfaction, subject-specific self-concept, emotional well-being).

1446 students provided data during the winter of 2015. 4th and 6th grade students filled the online Resilience in School Questionnaire, in roughly equal numbers (eDia: Molnár & Csapó, 2019). The students were enrolled in partner institutions of Center for Research on Learning and Instruction (University of Szeged), they applied for the project voluntarily, therefore we used non-probability sampling. The results from this sampling method could not be applied to the whole population, only to the students taking part in the research.

We developed two different types of instruments during the investigation. We developed a teacher questionnaire beside the student questionnaire, with the aim to collect data suitable to identify the circumstances of disadvantaged students. The student questionnaire containing the protective factors included 136 items of 13 instruments. Moreover, we supplemented the database with the results of the currently running achievement tests of the above-mentioned research group.

Results

1) Applicability of the Online Questionnaires

According to our hypothesis (H_1), subscales of the Resilience in School Questionnaire were reliably suitable for the investigation of the sample (Table 1). We got the lowest reliability-indices while investigating the inner consistency of WBI-5 (Bech, 1996; Rózsa et al., 2003; Susánszky et al., 2006), which is suitable to measure emotional well-being. The full sample's Cronbach-α value was 0.659, while it was 0.635 on the 4th and 0.670 on the 6th grade students. Despite the low number of items, it still surpasses 0.6 threshold. To understand the reason behind the decrease of the reliability value, further data collection is justified.

Our factor-analytical results did not always support our assumptions. In the case of the Ways of Coping questionnaire (Folkman & Lazarus, 1980; Kopp, 1994; Piko, 2001) three dimensions were produced instead of four. Our hypothesis related to the structure of the PISA 2000 Student Questionnaire (B. Németh & Habók, 2006) partly could be proven. In the case of 'self-concept' dimension we got the expected structure, but the "strategies" dimension part differed from the original structure. The CP-SRLI (Vandevelde & Van Keer, 2011; Bacsa, 2012) separated into the expected four factors, and the factor analysis of WBI-5 also confirmed the single-factor structure. Based on the results, the instrument is suitable to describe the sample and later to create resilience profiles.

Table 1
Reliability of scales and subscales

Scale/subscale	*Cronbach-α*		
	Total	***4th grade***	***6th grade***
I. Intrapersonal factors – individual			
General Self-efficacy	0,850	0,851	0,849
Ways of Coping	0,703	0,716	0,682
II. Intrapersonal factors – school and study			
Academic self-efficacy	0,839	0,825	0,834
Effort and persistence in learning	0,831	0,808	0,834
School attachment – attitude toward school	0,823	0,806	0,823
School motivation	0,787	0,750	0,779
Coping in school	0,710	0,674	0,730
III. Intrapersonal factors – self-regulation and strategies			
Self-regulation – Attention control	0,824	0,818	0,823
CP-SRLI – task analysis	0,749	0,725	0,763
CP-SRLI – planning	0,673	0,669	0,676
CP-SRLI – monitoring	0,798	0,782	0,797
CP-SRLI – product evaluation	0,797	0,788	0,795
Elaboration strategies subscale	0,811	0,815	0,797
Memorization strategies subscale	0,775	0,764	0,772
Control strategies subscale	0,826	0,834	0,812
IV. Environmental factors – peers			
Perceived social support (friends)	0,905	0,896	0,908
V. Environmental factors – teachers			
Teachers' support	0,911	0,896	0,911
Justice in school	0,771	0,765	0,776
Support of autonomy	0,861	0,840	0,860
Scales used to identify resilient students			
Self-concept of verbal competencies	0,851	0,834	0,843
Self-concept of mathematical competencies	0,862	0,857	0,855
General academic self-concept	0,856	0,846	0,852
Psychological well-being	0,659	0,635	0,670

2) Applicability of the Multi-perspective Approach, Size and Composition of Resilient Subsamples

Through the implementation of our multi-perspective approach, resilient students may be identified in different ways, when analysing the same sample. According to our hypothesis ($H_{2,3}$), the number of students identified as successful and resilient was higher in methods utilising single-item questions, than in multi-item scales or tests results. The ratio of resilient students varies between 3.4% and 5.8%, compared to the whole sample. It was the highest in the case of satisfaction related to Science performance and the lowest in the case of self-concept in mathematical competencies.

Beside the percentage compared to the whole sample, we calculated the ratio of resilient students, compared to the subsample of disadvantaged students. Regarding the factors based on satisfaction, 46.7% of disadvantaged students were resilient in Sciences, 44.7% in Hungarian literature and grammar, 44.1% in Mathematics. In terms of subject self-concept, 46.6% of the disadvantaged subsample was resilient in Science, 44.9% in Mathematics, 39.7% in Hungarian

literature and grammar. When applying more complex scales to identify resilient students in disadvantaged groups, in general academic self-concept 35.5%, in self-concept of mathematical competencies 28.8%, in self-concept of verbal competencies 27.7% of disadvantaged students were resilient. In the case of emotional well-being, 36.1% of the subsample were resilient. Due to the varying age groups and methodological approach, our measurements cannot be compared to the PISA measurements (e.g., OECD, 2011; 2018). However, we must highlight that by applying methods based on student self-description, higher number of resilient students could be registered. Moreover, this confirm our hypothesis (H_4), that larger ratio of students could be described as unsuccessful than successful.

Due to the amount of data available, the test results showed a rather small number of students identified as successful and resilient. Even when considering the results of Reading comprehension, Mathematics and Sciences test, the number of students whose performance reached the top 25% was below 10. Consequently, comparing resilient samples identified based on cognitive and non-cognitive aspects could not be carried out under this research.

Altogether we can say that this was a major limitation in our investigation, while highlighting a key pitfall in resilience research: the difficulty of investigating risk factors and of reaching disadvantaged individuals (Luthar et al., 2000). Therefore, it may be stated that reaching these students is difficult without sampling methods that ensure direct involvement.

Overlap between resilient subsamples identified through different perspectives were also studied. In the 'satisfaction with performance' dimension (28.1%), simple 'subject self-concept dimension! (28%) and 'academic self-concept' dimension (26.8%) students resilient in one subject were present in the highest number too. Altogether the number of resilient students in all subgroups within the main dimensions was low. Based on the analyses, we can say that the more aspects were considered the less resilient students were identified. Only 7% of students were successful in every dimension out of all disadvantaged students. PISA investigations highlighted that if resilient in one main field, students were resilient in other fields as well (OECD, 2011), hence we expected similar results. However, this hypothesis (H_5) was rejected.

3) Characteristics and Differences between Resilient Subsamples, Identified through Multi-perspective Approach

The multi-perspective approach was suitable to study pre-assumptions, arising from issues of the methodology standardisation. When investigating these results, it may be summarised that the results are highly diverse. They are demonstrated in Table 2.

While studying the subsamples of resilient students identified based on the 'satisfaction with performance', it revealed that in 7 factors out of 21 (general self-efficacy, optimistic coping strategies, stress reduction, passive coping strategies, school attachment, peer support, justice in school) no significant difference between subsamples were found. In 11 factors (academic self-efficacy, persistence, school motivation, self-control, task analysis, product evaluation, elaboration, memorization and control strategies, teacher support, support of autonomy) differences were found between resilient students satisfied with all three subject performance and resilient students in only one subject. In 3 factors (coping with academic challenges, planning, monitoring) significant deviation were identified between several subgroups. Regarding involved protective factors, there are major differences between variously formed resilient subsamples in most cases. The means were generally higher in subsamples who were resilient in several aspects. It may be concluded that the more aspects students are satisfied with their performance the more protective factors prevail.

Table 2
Aggregation of differences between resilient student subsamples (based on multi-perspective approach)

	Satisfaction	*Subject-specific self-concept*	*Academic self-concept*	*SUM*
S1	0	0	0	*0*
S2	0	1	1	*2*
S3	0	0	0	*0*
S4	0	0	0	*0*
SS1	1	1	1	*3*
SS2	1	1	1	*3*
SS3	0	0	0	*0*
SS4	1	1	1	*3*
SS5	1	1	0	*2*
SR1	1	1	1	*3*
SR2	1	1	1	*3*
SR3	1	1	1	*3*
SR4	1	1	1	*3*
SR5	1	1	1	*3*
SR6	1	1	1	*3*
SR7	1	1	0	*2*
SR8	1	1	1	*3*
P1	0	1	0	*1*
T1	1	1	0	*2*
T2	0	0	0	*0*
T3	1	1	1	*3*
SUM	*14*	*16*	*12*	*42*

S=Self: S1=general self-efficacy; S2=optimistic coping strategies; S3=stress reduction; S4=passive coping strategies; **SS=School and Study**: SS1=academic self-efficacy; SS2=persistence; SS3=school attachment; SS4=school motivation; SS5=coping in school; **SR=Self-regulation**: SR1=self-control; SR2=task analysis; SR3=planning; SR4=monitoring; SR5=product evaluation; SR6=elaboration strategies; SR7=memorization strategies; SR8=control strategies; **P=Peers**: P1=peer support; **T=Teachers**: T1=teacher support; T2=justice in school; T3=support of autonomy;
1=significant difference; 0=no significant difference

In the dimension of 'simple subject-specific self-concept' no significant difference revealed between subsamples, regarding altogether in 5 factors out of 21. General self-efficacy, stress reduction, passive coping strategies, school attachment and justice in school were rated equally in all three groups, therefore we cannot draw conclusions about their importance. Self-control, support of autonomy, and utilising optimistic, problem analytical coping were assumed more typical in students who belonged to the resilient group based on all three subject self-concepts, compared to students belonging in the subsample based on only one subject.

In all other cases resilient students with strong subject self-concept on two or three subjects valued the importance of intrapersonal and environmental factors' representation significantly higher than those considering themselves good at only one subject. These students therefore typically feel their academic self-efficacy, persistence, motivation, success in coping with everyday academic challenges more frequent and stronger than a resilient student in a single subject. Moreover, in terms of self-regulation and strategies, we can say that self-control during studying, regulating phases and utilisation of learning strategies is more typical in connection to these students. They also rated peer and teacher's support more typical.

Analysis of variance in subsamples based on 'academic self-concept' dimension was also carried out. The comparison of subgroups did not show significant differences in various factors. However, out of the intrapersonal factors in connection to school and studying, in the case of self-efficacy, persistence and academic motivation students resilient in all three aspects had significantly higher mean than their resilient peers in only one or two aspects. In alignment to that, we can also state about students resilient in three aspects, that regarding optimistic coping they received a significantly higher mean than resilient students in only two aspects.

Regarding the factors related to self-regulation and strategies, we can say that apart from memorization strategy there are major differences in all relating factors. In all cases it is true that resilient students in all three aspects have notably higher means than resilient students in only one aspect, and in many cases even higher than resilient students in two aspects. In the case of environmental factors, only teachers' support of autonomy was felt significantly more typical by resilient students in three aspects. These results are demonstrated in the summarising Table 2., to clarify the differences along protective factors.

Analysis on 21 factors and 3 main dimensions show that the results of 66.6% of 63 variance analyses, altogether 42 trials were significant. This could be interpreted as attributes of resilient groups identified through different techniques vary over 50%. This conclusion confirms concerns relating to sampling techniques. To unify results in this field, a matching methodology is needed.

When applying our multi-perspective approach, it was highlighted that identification methods based on only student self-description showed major differences between resilient student subsamples. The relating null hypothesis (H_6) was therefore rejected. This result calls attention to the relevance of our hypotheses. During the process of applying the specialised literature, result interpretation along methodical angles may support that conclusions are drawn in connection to relevant target groups. When creating development programmes, it is important to consider the methodology behind the results of the investigations. Our results imply that reliable programmes may only be developed after such action.

4) Similarities and Differences between Resilient and Non-resilient Students

We drew conclusions about the characteristics of factors involved in the research and about identifying procedures, by investigating the differences between resilient and non-resilient students. We investigated the differences along 21 factors and 10 procedures (Table 3). 72.86% of altogether 210 pieces of two-tailed t-tests were significant (altogether 153). We view the relating hypotheses ($H_{7,8,9,10}$) only partly verified.

The most significant statistical analysis was carried out in the cases of academic self-efficacy, academic motivation and monitoring in self-regulated learning phases. Resilient students describe themselves as persons with higher academic self-efficacy (e.g., Raskauskas, et al., 2015; Gordon 1996), with more motivation in carrying out school tasks (e.g., Fantuzzo et al., 2012; Li et al., 2011) and monitoring their learning process (e.g., Nota et al., 2004).

The most factors (a total of 13) with significantly higher means were in 7-9 procedures in resilient students. They are more persistent in their tasks (e.g., Cassidy, 2016), their connection to school is stronger (e.g., Sun & Stewart, 2007) and cope with the stressors of day-to-day learning more easily (e.g., Brooks, 1994). Moreover, there are major differences in contents fitting in with the theory of self-regulated learning. It is typical for most resilient students that they utilise elements to task analyse and plan prior to the learning process, and they can control their impulsiveness better during the task (e.g., Wang et al., 1994), they can monitor the tasks better, and evaluate the product after completion (e.g., Nota et al., 2004). They also engage the elaboration, memorization, and control strategies significantly more often than their non-resilient peers. They mostly rate their peers' and teachers' support more typical

and feel that their teacher's behaviour supports their endeavours for independence and autonomy (e.g., Plunkett et al., 2008; La Foret et al., 2000).

Table 3
Aggregation of differences between resilient and non-resilient subsamples

	Methods										
	1.	***2.***	***3.***	***4.***	***5.***	***6.***	***7.***	***8.***	***9.***	***10.***	***SUM***
S1	0	0	0	0	1	0	1	0	1	1	*4*
S2	0	1	1	0	1	0	1	0	1	1	*6*
S3	0	0	0	0	0	0	0	0	0	0	*0*
S4	0	0	0	1	0	0	1	1	0	0	*3*
SS1	1	1	1	1	1	1	1	1	1	1	*10*
SS2	1	1	1	1	1	0	1	1	1	0	*8*
SS3	1	0	0	1	1	0	1	1	1	1	*7*
SS4	1	1	1	1	1	1	1	1	1	1	*10*
SS5	1	1	1	1	1	0	1	1	1	1	*9*
SR1	1	1	1	1	1	0	1	1	1	1	*9*
SR2	1	0	1	1	1	1	1	1	1	1	*9*
SR3	1	0	1	1	0	1	1	1	1	1	*8*
SR4	1	1	1	1	1	1	1	1	1	1	*10*
SR5	1	1	1	1	1	0	1	1	1	1	*9*
SR6	1	0	1	1	1	1	1	1	1	1	*9*
SR7	1	0	1	1	1	1	1	1	1	1	*9*
SR8	1	0	1	1	1	1	1	1	1	1	*9*
P1	1	1	0	1	1	0	0	1	1	1	*7*
T1	1	1	1	1	1	0	1	1	1	1	*9*
T2	0	0	0	0	0	0	0	0	0	0	*0*
T3	1	0	1	1	1	0	1	1	1	1	*8*
SUM	*16*	*10*	*15*	*17*	*17*	*8*	*18*	*17*	*18*	*17*	153

1.=satisfaction–Hungarian grammar and literature; 2. =satisfaction–Math; 3. =satisfaction–Science; 4. =subject-specific self-concept–Hungarian grammar and literature; 5. = subject-specific self-concept–math; 6. = subject-specific self-concept–science; 7. =general academic self-concept; 8. = academic self-concept of verbal competencies; 9. = academic self-concept of mathematical competencies; 10. =psychological well-being;
S=Self: S1=general self-efficacy; S2=optimistic coping strategies; S3=stress reduction; S4=passive coping strategies; **SS=School and Study**: SS1=academic self-efficacy; SS2=persistence; SS3=school attachment; SS4=school motivation; SS5=coping in school; **SR=Self-regulation**: SR1=self-control; SR2=task analysis; SR3=planning; SR4=monitoring; SR5=product evaluation; SR6=elaboration strategies; SR7=memorization strategies; SR8=control strategies; **P=Peers**: P1=peer support; **T=Teachers**: T1=teacher support; T2=justice in school; T3=support of autonomy;
1=significant difference; 0=no significant difference

The least significant difference was found in the intrapersonal factors involved in the research, and in one environmental factor. Out of the individual factors, only the optimistic, problem analytic coping strategy was representative of resilient students. In all other cases significant results were present in case of less dimensions: based on four subsamples in general self-efficacy factor and based on three subsamples in passive coping factor. The investigation of differences highlighted that stress reduction and justice in school has less importance than previously presumed.

If the summary presented in Table 3. is viewed from the point of view of ten separate identifying methodology, we can say that no universal solution presented itself following either of those procedures. As per our previous assumption, results formed an irregular pattern. If we presume that the more similarity appears between the results from the other procedures the

more it presents the procedure's applicability, than it can be stated that six dimensions out of ten produced roughly the same results. Subject specific self-concept in Hungarian literature and grammar, Mathematics, and all three subgroups of academic self-concept measured by scales classified into this category. Significant differences were continually pointed out in 17 and 18, mostly overlapping factors, by using these procedures. More permanent results were therefore produced with these procedures. Identifying procedure based on the evaluation of emotional well-being, complementary to our base conceptions, is also a part of this group of procedures. We can say that in the case of the resilient subsample identified along this method, the significance of almost the same factors is confirmed.

5) Connections between Protective Factors and Positive Outcome

Based on the investigation of connections between protective factors, it can be stated that correlation coefficients representing the relation between individual factors (general self-efficacy, conflict solving methods) and other factors showed positive as well as negative values. Based on the analysis of the connection between factors, we can ascertain that most factors show significant, moderate correlation. However, out of the individual factors such as stress reduction and passive coping, out of the school and study factors such as school attachment and coping in school, out of the environmental factors such as peer support and justice in school showed significant, but week correlations with other factors.

In examining the correlations of protective factors with the general academic self-concept, we found moderately strong coefficients in most cases. Apart from four factors, results revealed that the protective factors connected to the students' self-concept. There is a moderate connection between the self-concept of verbal competencies and academic self-efficacy, academic motivation, coping with day-to-day school challenges, self-control, monitoring and product evaluation phases, the elaboration, memorization and control strategies, and peer support. Based on the self-concept in mathematical competence showed a significant decrease in the number of factors having moderate connection with this positive outcome. There were 7 out of 21 such factors, while 6 presented only a weak connection, and 8 had no significant connection at all. In the case of emotional well-being dimension, we found moderate significant coefficients with general self-efficacy, academic attachment, school motivation, coping in school and self-control. The results on the correlation with positive outcome further confirmed the importance of protective factor, elaborated in the previous chapter.

Possibilities for Further Research

Research, based on the improved instrument of this research, provides an opportunity for further investigations. The instrument, originally developed from the results of this dissertation's research, could be used on a representative sample (even with longitudinal approach), to investigate the differences between resilient and non-resilient students, and examine causal relations.

One of the main limitation of our research, was the size of the resilient sample, identified by achievement test scores. The size of the sample did not allow for the investigation of the characteristics of resilient groups of students, nor for the comparison with other methods. As a result, further research would be necessary to conduct the conclusions of each aspects of our multi-perspective approach.

Further development opportunities of our multi-perspective approach could be the expansion of the investigation of disadvantaged background. The limitations of the currently applied method could be compensated by the involvement of further variables. Beside the official data, similarly to other research (eg. Padrón, Waxman, & Lee, 2012), the teachers'

opinion on whether they consider students disadvantaged from a social, cultural or economical, aspect could be considered.

In addition to this, similarly to the methodology of system-level assessments, further research may contain an aggregated index, capable of the description of social-economic disadvantage. Like the international investigations (OECD, 2019) variables that describe the parents' level of education, occupational status, home possessions, may be applied to develop a composite index of socioeconomical status. Also, with the incorporation of psychological assessment methods, the multi- perspective approach may be expanded further through the review of stressful life events.

The expansion of statistical analysis applied during the examination of research findings, and the installation of the variable-focused approach provide further opportunities. The regression analysis, the cluster analysis suitable for separation of students' profiles', or the application of the methods of structural equation modeling could also result in the collection of further findings.

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Publications in Connection with the Dissertation

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