

## **Gifted Development at Schools: Research and Practice**



# **Gifted Development at Schools: Research and Practice**

*Edited by*

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## Preface

Research on giftedness has been conducted at the Department of Educational Psychology in University of Debrecen (earlier Lajos Kossuth University) for about 15 years. Though previously Professor László Kelemen had studied the development of abilities which theme was not far from that of giftedness but we focused our attention to talent first in 1987. That was the year when the European Council for High Ability was established and connecting to its work Hungarian research also began. Our colleagues created multidimensional cooperation: we exchanged our experiences in the Netherlands and the USA, in Germany and in Austria, we lectured at international conferences, and we accredited and started the teachers' postgradual training program of the ECHA for experts on gifted development at our university. The fact that we were asked to participate in the Comenius-HOBE program in 1998 has made our research even more intensive. Besides our university universities of three countries (England, Holland, Germany) are taking part in this program whose purpose is to give an impetus to gifted programs at schools everywhere in Europe. Our Department organized the 7<sup>th</sup> ECHA Conference at the University of Debrecen in August 2000 and that opportunity yielded further research and publications in English as well.

Our present volume is a particular summary of research on giftedness conducted at the Department of Educational Psychology in the last 15 years.

At one hand we made a selection from our lectures delivered at international conferences and studies published in journals and chrestomathies, at the other hand new studies written especially for this volume were also included.

Among the authors of this volume there are teachers of the Department, colleagues conducting their research in Ph.D. programs and experts on talent development at schools.

The themes of the volume can be divided into four chapters. The first chapter contains six studies focusing on theoretical and practical problems of talent-identification. In the second chapter nine articles can be found about talent development at school. In the third chapter six studies can be read about program effect examinations. The fourth chapter includes special problems discussed in nine studies: e.g. motivation, extracurricular activities, teacher training program for experts at talent development etc.

I recommend this chrestomathy for the reader hoping that our summarized experiences and results of research will promote the dynamic growth of school developing programs for gifted both in Hungary and abroad.

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# **Part One: Identification**



# The Problematics of Talent Identification: The Cognitive Abilities Tests (C.A.T.) as a Potential “Assistant”

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Our paper will briefly survey the most widely accepted theoretical models that are related to identification of talented or gifted children and which frequently appear both in recent Hungarian and foreign literature. However, apart from the need for a more and more sophisticated state of theoretical elaboration for support, our society and everyday psychological-pedagogical work demand at least the same level of efficiency in the field of creating reliable research methods which can be effectively used in practice. In the present study, we will introduce such a test (C.A.T.), which, although it satisfies these criteria, it is only known in narrow professional circles in Hungary. Also, as far as we know, apart from the present one, there has not been any other report published here concerned with the same issue as yet. We will compare the results attained by us to Raven and creativity test scores and also to data obtained through the Entwistle & Kozéki motivational questionnaire from samples of primary school students (of the age group 12 to 14) going to schools of traditional curricula and those attending institutions with special programmes for the gifted.

## Introduction

It is a commonplace to say that no two people are alike in the world. We are all different from most other people, based on the individual colour of our eyes, skin, or hair; but we also have different size feet, and everybody has their individual pattern of fingerprints, etc. Yet, these differences do not any more exert any influence on the quality of our lives or on the careers and walks of life we may choose for ourselves. Nevertheless, the individual mental abilities, together with stamina, diligence, and the level of physical strength and dexterity have always been crucial in the formation of our lives, and will probably continue to remain so in the future. It is on the basis of the level of development of these abilities that we normally set up various categories to identify certain individual talents or gifts. It is often believed that they (i.e., the talented or gifted people) are different or distinct from us. But what is it that is responsible for this difference? What accounts for the dissimilarity of gifted individuals from the so-called ordinary?

In almost all societies and historical ages, there emerged the need to somehow try to identify those children or young people who, in respect of various human qualities and abilities, surpassed their peers. Naturally, this effort could always be realised only on the basis of the ideology, social-scientific attitude, and economic

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conditions of the given society. It was always in the best interest of these societies to pay due attention to the most promising representatives of the upcoming generation so that they could be appropriately educated and developed. Due to the development of social sciences (such as sociology, pedagogy, and psychology) and the expansion of the scope of various exact research methods and procedures, we can safely state that, basically, by now the principles and scientific methods have evolved to such an extent that we can more thoroughly and reliably identify and select the so-called “potential talents.” For children, it is expedient to use this term because it is far from certain that a potentially gifted child will actually get to the stage of realising his or her full potential of capabilities, i.e., to the proper accomplishment of his or her talent. Along the way of individual personal development, there might be numerous factors (e.g. illnesses or other special events in the family) that can come up as impediments. In our opinion, it is our task as educators or psychologists to assist these individuals in making the best of their possibilities despite all the difficulties. It is important to emphasise this because reliable research data indicate that children who can be considered gifted are oftentimes more sensitive, emotionally more vulnerable and unbalanced than their peers (Freeman, 1991; Scarr, 1992). The necessary support coming from the school might in more cases than one fail to materialise, owing simply to our failure even to recognise the gifted children. There can very easily be children whose special talents remain hidden due to their more introverted or inhibited personalities (Kogan and Pankove, 1972). As a matter of course, the knowledge and application of psychological methods used for identifying giftedness cannot substitute the impressions and the knowledge acquired about the students during the everyday practice in teaching. It is the joint application of these two kinds of knowledge that can help in the reliable diagnosis of gifted children. The choice of the procedure or test to be deployed can be most heavily influenced by what we accept and identify with for a conception of giftedness.

In this respect, the number of choices is really abundant, since by now a high number of definitions and classifications have been produced to choose from. When analysing these different approaches, we recognise that there is no full consensus among them concerning the nature of and the criteria for giftedness. Therefore, we believe that it might be useful for the readers if we briefly introduce some of the better known ones.

In the United States, where gifted identification and programming is at the most advanced level, one of the characteristic features of the official definition of giftedness is that it regards a talent or gift a relatively stable trait, which is independent of the age, culture, or environment. The definition was first published in the document known as the Marland Report (1972):

“Gifted and talented children are those identified by professionally qualified persons who, by virtue of outstanding abilities, are capable of high performance. These are children who require differential educational programs and/or services beyond those provided by the regular school program in order to realize their contribution to self and the society. Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:

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- general intellectual ability
  - specific academic aptitude
  - creative or productive thinking
  - leadership ability
  - visual and performing arts
  - psychomotor ability" (Marland, 1972. p. IX., cited by Mönks, 1998).

We believe that it is important to underline that the definition emphasises the role and responsibility of society in providing the gifted with the environmental (personal and material) conditions necessary for their development. These may be quite different from the ordinary in any of the given instances. Yet another valuable feature of the definition is that it serves as a guideline for numerous programmes for gifted children all over the world. At the same time, it is also restricted in its relevance, since it does not contain a number of essential factors, like motivation and social environment.

This is partly why the above concept proved to be outdated by the Renzulli model (1986), which has become almost a classical one by the present time. Renzulli incorporates both motivation and the energetic factors in his so-called "three-ring" model. He connects the criteria for giftedness to a simultaneous presence and expression of three clusters of traits. According to him, gifted and talented children are those who can be observed to possess or being capable of developing this composite of traits of above-general and/or specific abilities, high levels of creativity, and high levels of task motivation. The gifted are capable of applying these traits to any potentially valuable area of human performance for the benefit of society. Renzulli attaches the same significance to task motivation as to creativity and to special abilities. Basically, we can also agree with this since, among others, it is persistence, critical thinking, self-confidence, and the power of the self that can ensure the proper development of talents. Furthermore, Renzulli divides the above-average abilities into general and specific sub-groups. The first sub-group contains the quick, precise and selective processing of information, good memory, fluent speech, etc. The specific abilities comprise the application or use of the general abilities in some special field (like composing music, puppeteering, mathematics, etc.).

As regards the Renzulli-model though, we also might feel that there is something missing (just as in the case of the Marland definition). The conception does not include the persons surrounding the gifted individual as part of the social environment (such as the family, the school, and the peer groups). Thus, it was not by chance that some researchers modified and developed Renzulli's idea further. According to Mönks (1992), the development of giftedness is not possible without the appropriate environment, since the inner dispositions may surface with the help of the factors of the environment, which provide a basis for them. Mönks projects the Renzulli-rings (task motivation, creativity, and above-general abilities) on a triangular background, where the family, the peers, and the school form the points of the triangle. In the role of the family, it is the function of transmitting values that he underscores, the teachers help in opening up the treasure troves of knowledge, while the peers play a part as an incentive in competition.

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We could possibly list a long line of examples related to the encouraging or obstructing function of the environment, illustrating instances when these influences have had a crucial impact on the lives of gifted students or adults (including academic competitions, parental incentive or the lack of it, an environment void of stimuli due to a poor financial background, etc.). Thus we can agree with the magnitude of emphasis that the Mönks-model places on the environment. The other piece of modification implemented by Mönks is that he replaces task motivation with simply motivation, which, in this way, means a wider energetic basis and a larger unity of the personality.

An even more elaborated and heavily influential theory is represented by Gardner's (1983) "multiple intelligences" theory, in which the author expands the concept of intelligence, formulating a list of seven separate intelligences, which are independent of one another. Thus, we cannot foretell the level of any or all of the intelligences solely on the basis of one of them. Originally, he defined the following distinct intelligences: logical-mathematical, linguistic, spatial, bodily-kinesthetic, musical, and personal. The last one he divided into intra- and interpersonal intelligences. His theory is fairly popular on the one hand, and appears to be a bone of contention on the other hand, since it may be considered to be more on the speculative side than scholarly-based.

Further major groups of theories of giftedness are represented by the sociocultural-psychosocial and performance oriented models, the theories based on factor analysis, etc. However, we will not offer an introduction into these in the present paper. In our brief survey, we have mostly concentrated on the cognitive approaches and the ones based on abilities. While selecting our methods of research, we took Mönks' model for a point of departure, since we are convinced that, without the proper level of development of cognitive abilities, there can be hardly any instances of gifted individuals in any walks of life. Take any branch or field of arts (fine arts, ballet, the histrionic arts, instrumental music, etc.) and you will see that the appropriate abilities of paying attention, remembering, learning, creativity, etc. prove to be indispensable for role playing, performing, or improvising. In various kinds of sports activities, it is also essential to have the above abilities during the process of the thoroughly observing and practising certain series of bodily movements (suffice to mention here the significance of this in the case of field events in track and fields, or for swimmers, marksmen, etc.). In team sports, one also needs to pay attention to the movement of the other players and of the opponents, and also to tactics, etc. In the case of individuals involved in scholarly or scientific activities, we possibly might not need to go into details concerning the importance of the development of cognitive abilities, either. We can also possibly agree that the really talented and successful politicians and managers also possess the abilities listed (gift of leadership). As a matter of course, we do not have to restrict the scope of gifted people to world-famous Olympic champions, Nobel-prize winning scholars and scientists, brilliant artists, etc. In most of the cases, it is the so-called famous people who stand in the limelight. Yet, for the same reason, we may also consider a doctor, an educator, etc., talented or gifted if they pursue their profession in a special or unique way, or at a very high level of efficiency. In the latter cases, the high level of development of cognitive abilities is also of criti-

cal importance, since only through this can they rise above the average practitioners of their respective professions.

This is how we arrive at the idea, which we also share, namely, that it is always necessary to examine the abilities, i.e. the constituent parts of the intellectual sphere, if we want to ensure a reliable identification of the gifted.

Therefore, in accordance with the above, we set up the objective of carrying out a study in which we wish to compare gifted and ordinary primary school students from the following classical aspects of talent diagnostics: classical intelligence, special cognitive abilities, creativity, and motivation.

The objective of our study can be summed up as follows:

- a) Apart from the talent identification methods, which are relatively widespread in domestic professional circles, we set up the objective of piloting and introducing a test, which is lesser known and used in Hungary. We wished to introduce this test (known as C.A.T in English-speaking countries and as K.F.T. in Germany, hereinafter referred to C.A.T.) used as a time-honoured and reliable instrument for surveying the abilities of students and for predicting their academic proficiency, to a broader audience of professionals. We also intended to compare the data gained by us to the average results available from Germany.
- b) Furthermore, we were curious to see if there was any essential difference on the basis of an examination of intelligence, cognitive abilities, creativity, and motivation between the students going to schools of traditional curricula and those attending institutions with special programmes for the gifted.

### **The characteristics of the survey sample**

The survey covered 302 students from four different schools who finished the 6<sup>th</sup> or the 8<sup>th</sup> form during the 1997-98 academic year. The students were from the following schools:

- Zsigmond Móricz Primary School, Mátészalka;
- Gábor Bethlen Reformed Primary School, Törökszentmiklós;
- Vénkerti Primary School, Debrecen;
- Bálint Balassi 8-form Secondary Grammar School, Budapest.

In a breakdown by school: Mátészalka and Törökszentmiklós together covered 88 students, Debrecen 102 students, and Budapest 112 students. The administration of the tests and the questionnaires required multiple visits in each school and class, so the respective figures are somewhat lower on occasion because of the absences. As regards the ratio of different sexes/genders, 129 boys and 173 girls were surveyed. 200 students participated in special programmes for the gifted (in Mátészalka, Törökszentmiklós, and Budapest), while one third of the sample (102 students in Debrecen) followed a curriculum and a thematic schedule that can be considered traditional. As far as the age of the students is concerned, there were 160 students from the 6<sup>th</sup> form and 142 students from the 8<sup>th</sup> form among those surveyed.

## **Tools of the survey**

### **1. Cognitive Abilities Tests (C.A.T.)**

In international practice, C.A.T. is one of the most popular survey procedures for measuring cognitive abilities (Itsuokor, 1994). The final version of the test was made in the USA in the 1970s, and it was basically used for assessing young people between ages 10 and 18 (Thorndike & Hagen, 1971). The test comprises 10 sub-tests altogether, through the help of which a lot of information can be gained about the individual assessed. At the same time, a significantly broader spectrum of abilities are necessary for doing it than for doing the Raven test, for example. The 10 sub-tests can be divided into 3 larger categories: verbal, non-verbal, and quantitative (quantity and computing abilities) tasks. The tests of the individual categories are as follows:

<i>Verbal tasks</i>	<i>Non-verbal tasks</i>	<i>Quantitative tasks</i>
Vocabulary	Figure Analogies	Quantitative Relations
Gap-Filling in Sentences	Figure Classification	Creating Equivalence
Verbal Classification	Figure Synthesis	Matrices
Verbal Analogies		

### **2. The Raven Test**

In the domestic practice of psychology, several measuring procedures have become widespread for examining the intellectual abilities of children, among which a very important role is attached to Raven's Progressive Matrices (1936). Raven's test was given particular importance in selecting members of the British military forces during World War II. In our survey, we used the version that consists of five sets (A, B, C, D, and E), and 60 figures.

### **3. The Questionnaire of 'Academic Motivation'** (for more detailed information, see Kozéki & Entwistle, 1986)

With the help of the questionnaire, we can explore the motivational aspect of learning at school in 10 groups of motives altogether. It provides information concerning the nature and the strength of the learning motives of the individuals questioned. The groups of motives serving as different aspects of analysis are as follows:

<i>Warmth:</i>	the need for care and emotional warmth
<i>Identification:</i>	the need for acceptance, chiefly on the part of educators
<i>Affiliation:</i>	the need for belonging, chiefly to coevals
<i>Independence:</i>	the need for following one's own ways
<i>Competence:</i>	the need for acquiring knowledge
<i>Interest:</i>	the need for pleasant, joint activities
<i>Conscience:</i>	the need for trust and appraisal, self-appraisal

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<i>Need for Order:</i>	the need for adopting values
<i>Responsibility:</i>	the need for self-integration, moral personality and attitude
<i>Sense of Pressure:</i>	sensing that educators demand inexecutably much without any understanding. This feeling does not have a motivating character.

#### 4. The Torrance Test of Creative Thinking

We used three tasks from the procedure that comprises several sub-tests. These were the following: Circles, Unusual Application, and Figure-Filling.

*The main queries investigated in the study*

- How can the Hungarian version of C.A.T. be implemented?
- Are the results scored in the C.A.T. related to the performance observed in the Raven-test and the creativity test?
- Do the points scored in the different tests and sub-tests differ depending on gender, special programming, or age groups?
- Can we observe discrepancies among the sub-samples (age, gender, special programming), considering the motivational structure and characteristics?

## Results of the survey

### 1. Results of C.A.T.

By applying a three-aspect variance analysis, we probed whether there was an interaction among the factors of learning within specific age groups, gender categories, and the different educational forms (special or traditional). We did not find any trace of interaction, and this means that we can only observe the impact of individual factors on their own. While comparing students of different age groups (6<sup>th</sup> and 8<sup>th</sup> formers), we noticed that the older students scored significantly higher ( $p=0.00$ ) in each sub-test and on aggregate, as well. This can be explained by the fact that a two-year age difference appears to be rather substantial and consequential even in a statistical sense in an age period when the intellectual abilities can develop quite dynamically, due to the positive influence of the school. During the academic learning process (through acquiring new material and being subject to various forms of testing), the students solve problems which are more and more diverse in an increasingly quicker fashion. As a consequence, they become faster and more self-confident which, as a special socialising process, can also function as a background factor enhancing performance. This tendency of the result averages rising with older age groups entirely corresponds to the tendency experienced in Germany (Perleth, 1985).

Repeating the data available in the relevant literature on the tests (Perleth, 1985), the results we received did not show discrepancy between the sexes. The only significant difference was observed in the first verbal task (vocabulary) in favour of the girls ( $p>0,05$ ).

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However, when analysing the averages of the results in the verbal tasks, the tendency of the verbal superiority of the girls over the boys can also be observed in the C.A.T., a tendency which is emphasised by surveys carried out using other intelligence tests, as well. The aggregate scores also confirm the tendency of the advantaged position of the girls, yet this result is not significant. The groups of students attending traditional and special institutions, nevertheless, differed significantly from one another in all the sub-tests and in the aggregate values, too ( $p=0.00$ ). This is illustrated in our first table (Table 1). This result is not surprising, since admittance to the classes with special curricula was preceded by a careful selection process (Balogh, 1995), during the course of which teacher's evaluations, psychological tests, and questionnaires had been used. For the same reason, we actually had anticipated that, in an optimal scenario, a measuring tool, which had not been used before would also justify the reason for the acceptance of a methodical selection process based predominantly on cognitive abilities (since C.A.T. is a cognitive survey method, too).

**TABLE 1**  
**C.A.T results of students going to traditional schools and of those attending institutions with special programmes for the gifted**

What kind of class does the student attend?		Number of items	Average	Deviation
C.A.TV1	special	200	17.32	2.82
	traditional	102	14.43	3.31
C.A.TV2	special	200	19.09	2.76
	traditional	102	17.50	3.06
C.A.TV3	special	200	17.65	3.00
	traditional	102	14.80	4.01
C.A.TV4	special	200	13.80	3.01
	traditional	102	10.34	3.19
C.A.TNV1	special	200	18.26	3.51
	traditional	102	13.90	4.75
C.A.TNV3	special	200	24.29	4.53
	traditional	102	17.07	6.42
C.A.TQ3	special	200	17.60	4.43
	traditional	102	12.68	4.52
C.A.TVSUM	special	200	67.85	8.01
	traditional	102	57.07	9.91
C.A.TNVSUM	special	200	42.54	7.13
	traditional	102	30.97	9.63
C.A.TSUM	special	200	127.99	15.73
	traditional	102	100.72	18.90

It is worth comparing the results of the C.A.T. with the scores of the Raven test (see Table 4). In the respect of the factor of traditional v special education, the superiority of the gifted students is quite unanimous in both. At the same time, a salient difference between them is that, while in the Raven the best students scored an average of 83%, their achievement in the C.A.T. only came up to 74% (127 correct answers out of a total of 170). One possible interpretation of this might be

that the C.A.T. is difficult even for the best. For this reason, by using it, we can more efficiently screen and select even among the intellectually most outstanding students. It is even more revealing to look at the data gained from students with lower performance indicators (those attending institutions running programs of the traditional curriculum). Their average score in the Raven was 75%, while in the C.A.T. they only made 58%. Thus, we can arrive at a twofold conclusion. On the one hand, we can see that this latter test is even more difficult for them to do. On the other hand, it seems evident that the C.A.T. can be much more efficiently applied for expanding the scale, i.e., for separating the ones who are good and the ones who are less than good. Obviously, we were also curious to see whether there was a correlation between the results scored in the two tests and the values observed within the category of creativity. This is shown in Table 2 below.

**TABLE 2**  
**Correlation between the C.A.T./Raven and the creativity scores**

Name of sub-test	Raven score	Figural fluency	Figural flexibility	Figural originality	Verbal fluency	Verbal flexibility	Verbal originality
Vocabulary	0.424**	0.201**	0.201**	0.230**	0.300**	0.261**	0.283**
Sentence completion	0.453**	0.156	0.238**	0.298**	0.303**	0.335**	0.290**
Verbal classification	0.373**	0.038	0.063	0.069	0.265**	0.244**	0.195**
Verbal analogies	0.364**	0.057	0.015	0.131	0.367**	0.346**	0.346**
Figure analogies	0.469**	0.048	0.033	0.093	0.306**	0.243**	0.214**
Matrices	0.452**	0.125	0.081	0.140	0.369**	0.227**	0.323**
Figure classification	0.541**	0.062	0.078	0.175	0.303**	0.206**	0.282**

Note: The sign \*\* indicates a p=0.00 significance level.

It can be quite clearly seen in the table that there is a medium level correlation between all the sub-tests of the C.A.T. and the Raven scores. It is in the case of the figure classification sub-test scores, which sub-test is the most similar to the Raven, that we can discern the highest correlation value. It is not surprising that the verbal classification and the analogies sub-tests display a lower correlation with the Raven, since it is perhaps the production surfaces of these two tests that show the most significant dissimilarity. The sentence completion sub-test, however, exhibits some similarity with the Raven, because the principles applied to solve them are alike. In both cases, something first has to be analysed and then completed. The values of creativity do not expose any resemblance, which is not altogether unexpected, as the procedure for examining cognitive abilities first of all requires convergent thinking, too.

## 2. The results of the Raven test

In the 60-figure version, similarly to the Coloured Raven, each correct answer scores one point, and thus the maximum score is 60 points. The first aspect we analysed was the boy-girl comparison. (see Table 3)

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**TABLE 3**  
**Raven scores of boys and girls**

	Sex/gender	N	Average	Deviation
RAVEN	Male	119	49.18	6.97
	Female	153	49.63	5.37

The scores of the two sexes are entirely the same, the members of both groups produced an average of 49-50 correct answers or solutions to the 60 figures. The deviation in the scores of the boys is slightly larger compared to that of the girls. These values indicate that, on the basis of intellectual abilities measurable with the Raven test, neither one of the groups may be considered homogeneous. There are quite significant individual differences within the groups (around 10%). Like in the case of the scores of creativity tests, we can state that there is only a very slight difference between the sexes. Nevertheless, it can be discerned that the students who are deemed gifted do much better than the ones who are not involved in special programs for the gifted (i.e. those who go to schools of traditional curricula) (see Table 4).

**TABLE 4**  
**Raven scores of students going to traditional schools and of those attending institutions with special programmes for the gifted**

Curriculum	N	Raven average	Deviation
Special	175	51.85	4.53
Traditional	97	45.07	6.20

The difference between the two groups is rather significant ( $p=0.00$ ). The "gifted" students on average gave 7 more correct answers to the figures than their "ordinary" peers did.

### **3. Results of the questionnaire on motivation**

Practically, the only discrepancy between the two sexes was discerned in the dimension of responsibility. The girls in this dimension scored significantly higher ( $p>0.05$ ). The explanation we can offer for this phenomenon is that girls reach the age of puberty earlier and their moral judgements and overall behaviour seem slightly more developed at a younger age than that of the boys, who mature somewhat later. They also tend to take care of their academic work and assignments more diligently and conscientiously. All in all though, we can say that the motivational structure of boys and girls was the same overall in the case of the subjects of our scrutiny. We were also curious to find out if there was a difference concerning the motivation structure between the different age group samples, i.e. between the 6<sup>th</sup> and the 8<sup>th</sup> formers.

About this latter aspect of the analysis, we can say that we found a rather substantial difference between the two age groups along 8 dimensions (including identification, interest, responsibility, competence, conscience, warmth, sense of pressure, and need for order) ( $p=0.001$ ). The younger ones seem to have much more demand for joint activities as well as for the trust, liking, and care of their teachers and their peers. They display a stronger need for acquiring knowledge and adhering to values. They tend to consider academic requirements less burdensome and depressing. The background reason for this might be that during the time period of our survey, those in the 8<sup>th</sup> form are already fairly close to the end of their primary school studies. Consequently, they become somewhat tired and socially less sensitive towards their environment. They are, as it were, halfway through graduation, so it does not represent so much of new experience and incentive, as it happens to do in the case of the 6<sup>th</sup> formers. When we compared the groups of students attending special programmes and those going to schools of traditional curricula (Mátészalka, Törökszentmiklós, Budapest and Debrecen, respectively), it was only in the dimension of pressure that we noticed a substantial difference ( $p>0.05$ ). The students of the Debrecen sample were the ones who felt more that the academic requirements were more difficult to satisfy. The students involved in special programmes could, during a period of several years, get accustomed to the more serious expectations and exams, which we think might be the reason for their different approach to the requirements they have to meet in general.

#### **4. The results of the examination of creativity**

In our overall survey, we examined figural and verbal flexibility, fluency, and originality. Owing to the specific character of the task, there could be no maximum score set. We first compared the representatives of the two sexes by applying a twofold sample t-test.

In all the six dimensions listed above, we found total similarity. This again confirms the fact noted several times before in the relevant literature, namely, that there is no statistically discernible difference between the sexes as far as the issue of creativity is concerned. It was only in the case of figural flexibility that we noticed a significant difference ( $p=0.005$ ). However, we did observe a gap between the results received from the groups of students involved in special programmes for the gifted and the groups of those attending schools of the so-called traditional curricula.

The gifted students scored substantially higher in the categories of verbal flexibility, fluency, and originality, as well. In the latter two categories, they as good as doubled the score values of the other group ( $p=0.000$ ). As far as figural characteristics are regarded, we did not experience a difference. The data received can be explained through the fact that gifted students are generally and essentially known for their verbal glibness, the high level of development of their vocabulary, and the originality of their ability to express themselves in a genuine fashion. Most of the subjects taught at school tend to be concentrated on verbal skills and abilities, so they can be developed to an even higher level during the education

received at school. As regards the comparison of the individual schools, we can point out that, in the case of each of the creativity indicators, it was the students from Budapest who scored highest. They were followed by the students from the smaller settlements where, at both locations, the school offers special programs for the gifted. Finally, the lowest scores were produced by students from the Debrecen schools (where the curriculum is traditional). This is not surprising, mainly because Budapest schools are in the most favourable position from the aspect of the number of students applying for admittance. Higher numbers of young people who wish to study in the individual schools provide a larger pool for selection purposes in order to put together the best special classes. While both of the schools located at Mátészalka and at Törökszentmiklós can select their prospective students from the whole population of the respective settlements, the Debrecen school in our survey is an institution that belongs to one specific community within the city, and it is not considered to be one of the schools with the highest quality of students. The inter-relationship between the actual geographical location and performance appears to be more accented in the tests examining intelligence and cognitive abilities.

## **Discussion**

The objective of our survey was to test an examination procedure that, on the basis of previously documented international experience, appeared to be eligible for the purposes of selecting candidates for special programmes for the gifted and for screening larger groups of the population. The samples for our survey were taken from primary schools both in the capital and in the provinces (including groups of students involved in special programmes for the gifted and groups of those attending schools of the so-called traditional curricula).

Following the traditions of talent identification research, we compared the results of the tests to data received through other tests (the so-called Raven test and creativity tests) and to responses collected by means of questionnaires (on motivation). We were glad to see that yet another application of the C.A.T. in Hungary proved to be a successful attempt, and that the test could be effectively used in practice. The data we processed turned out to be quite similar to the results of a German survey of a fairly large pool of students (involving several thousands of individuals). The C.A.T. can be handled fast and it can be applied for the purposes of measuring a number of cognitive abilities. It provides a much more differentiated picture about the intellectual abilities of individuals in given groups than the previously used procedures did. We consider this very important because, in the process of selecting individuals for creating special classes for the gifted, even minor differences can have an important role. As a matter of course, the statistically processed aggregate results cannot efficiently point out the individual differences between the students. By studying the raw received data, it can be noticed however that the best students scored very close to one another in the Raven test. Thus we may say that the test does not really screen efficiently in the highest stratum. At the same time, in the seven sub-tests of the C.A.T., even the best students

scored in a fairly wide range. Thus, due to the variety of the tasks, we can obtain reliable information concerning the ability structure of the entire personality.

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# **Talent Identification and its further Reinforcement in a Complex Talent Improvement Program**

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In 1993 our Secondary Grammar School Bálint Balassi, which is situated in Budapest, decided to start *eight-year-form* education system. It means that pupils start their education at the age of 10 and finish it at the age of 18.

The necessary curricula for each subject were set by the members of the teaching staff. But before setting the curricula we made a *survey* among the parents living in the 17<sup>th</sup> district of the capital and in the surrounding areas about the measure of their claim to this type of education and to improvement of ability. We asked pupils and their parents how many of them are ready for making increased intellectual efforts. According to this marketing it appeared that the number of the applicants probably would be more than the capacity of our school for this special program, as there wasn't any other institution in the surrounding area dealing with improvement of ability and talent nurturing. So the claim to this type of education program was really great.

Getting the survey's results we worked out our pedagogical program and put *improvement of ability* into the centre of it. The studying elements in each subject are designed in a linear way and the curricula are *enriched*.

Besides the enriched curricula we have *different level groups* in the same form. The best pupils who are more talented and more interested in a given subject can learn in a so-called "higher level group". In addition to this special inside differentiation we add the *mentor way* of education for the best pupils.

We pay special attention to *improvement of personality* and also to early *detection of underachievers*. The necessary information we get from a special pedagogical-psychological examination of efficiency.

We decided to measure pupils' general intellect, their learning motivation and learning strategy, their level of anxiety and their different personality features. The examination results are completed by parents' and teachers' opinions and we try to work out the way of solution for the underachievers.

In addition to improvement of ability we organise the *system of final exams*. At the end of the academic year pupils take final exams in two or three subjects in front of an examination board.

During the academic year our pupils attend the *regular afternoon activities* which have two aims; firstly to offer more different activities where pupils complete and enlarge their knowledge, secondly the school gives all kinds of activities where children can improve their special abilities, they can manifest themselves creatively.

According to the pedagogical program this kind of education is for pupils who are able for making increased intellectual efforts. As the number of applicants every year more than twice, or three times more than we could accept, we have to examine the pupils' cognitive abilities. During the *talent identification* we examine those most important abilities which are useful to achieve good results at school. We use standard written tests and concentrate on their memory, attention durability, verbal and visual memory, their general intelligence and their problem-solving ability. We test their communication skills, their creativity and their general knowledge on oral entrance exam. The applicants' results are given in per cent and we choose the best pupils for our education program. To choose the suitable tests and methods we ask special experts help. We have very close connection with the experts of the Department of Educational Psychology of Lajos Kossuth University, Debrecen. We ask them to give us hand in connection with talent identification. Besides this the members of our teaching staff take part in the two-year long post graduation program, organised by University of Debrecen on improvement of giftedness. At the moment 12 teachers of our teaching staff have the ECHA diploma.

In spite of these steps taken by the system arises the question whether the adopted ability examinations during *the selection are reliable or not*. Obviously we know, that every examination has the hidden possibility of making mistakes, as we can't examine all the elements of the cognitive abilities. From another point of view the uncertainty is increased by the fact that we speak about an only examination which is taken only once. It is certain that if these examinations were taken more than once, we would get not the same results, as these results are influenced by the time of examination, by the pupils' current mental, physical and emotional state and by many other circumstances. This fact arose the need to examine the entrance examination's results and the further achieved school results. We wanted to know if there is any connection between the achieved results and if it is so, how strong the connection is. Our premise obviously was that the two data careers are not independent from each other. We wanted to prove this fact by statistics and by a kind of regressive calculation.

*The examination* was focussed on pupils of three classes who started their eight-year-form education at our secondary school in 1998. There are 74 pupils all together. The school achievement is represented by *average school results* at the end of the academic year. During the regressive calculation we compared these data careers (1 is the worst an 5 is the best mark) with *the entrance exam's results* which are given in per cent (see Table 1, Table 2 and Table 3). The selection of pupils into a given class depends only on the fact what foreign language they want to learn. On the charts you can follow that there isn't any big difference between the school achievement at the end of the academic year. The class C has the weakest achievement (4.05) but this is still under significant level.

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**TABLE 1**  
**Results: 6<sup>th</sup> form, Class A**

Number of pupils	Name	Results of the entrance exam (%)	School achievement
1.	B. G.	58	4.3
2.	B. G.	68	4.5
3.	Cs. B.	68	4.9
4.	D. D.	65	5.0
5.	D. V.	59	4.3
6.	E-Sz. F.	62	4.4
7.	F. E.	65	4.1
8.	F. J.	65	4.4
9.	G. J.	69	4.3
10.	K. K.	50	4.3
11.	K. Z.	50	4.3
12.	K. B.	68	4.1
13.	K. G.	69	3.6
14.	M. R.	49	4.3
15.	O. Zs.	58	3.9
16.	R. A.	66	4.5
17.	R. Cs.	49	4.0
18.	S. Z.	40	3.5
19.	Sz. M.	50	4.1
20.	Sz. K.	54	4.0
21.	T. Cs.	57	4.8
22.	U. N.	61	4.7
23.	Z. Z.	40	3.5
24.	Z. F.	54	4.4
Average:		58.08	4.26

**TABLE 2**  
**Results: 6<sup>th</sup> form, Class B**

Number of pupils	Name	Results of the entrance exam (%)	School achievement
1.	B. B.	55	4.2
2.	B. E.	66	4.7
3.	C. A.	53	3.6
4.	D. R.	73	4.9
5.	E. M.	41	3.8
6.	F. B.	63	3.7
7.	F. Á.	58	4.8
8.	H. P.	77	5.0
9.	H. L.	84	5.0
10.	H. M.	64	3.6
11.	K. V.	83	4.9
12.	K. K.	73	4.7
13.	K. E.	77	4.8
14.	L. B.	54	3.9
15.	M. A.	91	5.0
16.	M. Á.	49	4.2
17.	N. V.	54	2.9
18.	S. B.	70	4.5

19.	Sz. Sz.	49	3.3
20.	T. K.	62	5.0
21.	T. Á.	70	4.9
22.	T. D.	57	4.4
23.	T. T.	69	4.8
24.	V. Z.	58	4.3
Average:		64.58	4.34

**TABLE 3**  
**Results: 6<sup>th</sup> form, Class C**

Number of pupils	Name	Results of the entrance exam (%)	School achievement
1.	D. Á.	73	4.8
2.	E. B.	38	3.2
3.	E. P.	57	3.9
4.	F. K.	65	4.5
5.	H. B.	62	4.5
6.	K. N.	78	4.1
7.	K. Á.	44	3.7
8.	K. N.	72	4.0
9.	K. K.	65	4.1
10.	L. M.	64	4.8
11.	M. R.	47	4.0
12.	M. G.	70	4.1
13.	S. D.	50	3.9
14.	SZ. G.	50	3.1
15.	T. M.	47	4.8
16.	T. T.	48	3.5
17.	T. L.	66	4.1
18.	T. O.	66	3.8
19.	T. T.	66	4.9
20.	T. ZS.	59	3.8
21.	T. T.	65	4.2
22.	T. E.	62	4.1
23.	U. T.	78	4.0
24.	V. G.	61	3.8
25.	Z. I.	45	3.8
26.	Z. J.	63	4.5
Average:		60.04	4.05

The next table shows the *signification of the correlation coefficient* (Table 4). Here, the differences and dispersion show that from the point of homogeneity the classes are similar even though the B class shows bigger differences. According to the correlation\_coefficient we can prove that the data careers are not independent from each other. The level of signification is higher than the results given by the psychological tests. It proves that the power of unintentional circumstances is not strong, so the results given by the psychological examinations at the entrance exam are correct. These results can give the correct data careers about the pupils' abilities and skills in order to choose those who are able for making increased efforts in studying. So we don't have to complete the process of talent identifica-

tion, but we can utilise the saved time and energy on the different talent improvement areas. In spite of the facts we don't think that this kind of selection works forever. The process of selection can be added by new elements, which are proved by new scientific experiences. At the moment we work on the problem to reduce the subjective elements from the teachers' side during the oral entrance exams.

**TABLE 4**  
**Correlation coefficient of the entrance exam  
and school achievement**

	r	p
Class A	0.5000	0.01
Class B	0.7150	0.001
Class C	0.4701	0.015

From the given data careers besides the correlation results we tried to read out more facts. By comparing the one-off results of the dependent and independent variables we can discover those pupils who are tend to *underachievement*. By examination of efficiency we can reinforce or give up the suspicion of underachievement. When it is proved by the data careers we work out a pedagogical solution, which is directed and co-ordinated by the class master. Of course we don't deny that in some cases we can't identify the real cause of underachievement, so we can't give any solution or help. But from the other side we get real pleasure and happiness in those cases when by the pedagogical help the pupils can achieve better results, they find the suitable ways of their ability improvement.

We can get an interesting result when we compare the previously mentioned two data careers in the case of those pupils where the school achievement is rather poor. You can find 4,5 and 6 pupils like this in the different classes. Though it is not clear for you from the charts, as we used only the initials of pupils' names, but it is a fact that from the 15 pupils 12 are boys. This fact reinforces the well-known empirical pedagogical experiences and also coincides with the research results, which have been made recently. According to these experiences many of the boys achieve worse results at school than girls with the same abilities. At this time we haven't got the time for searching the causes of this fact, but undoubtedly it proves the fact that we have to look for underachievers mainly among boys.

At last we have to emphasise that we don't intend to finish this kind of examination by getting the correlation. We are going to do the same examination with further forms and we would like to follow the further school achievement with these pupils as well. We would like to see the trends by utilising the results of the examination of efficiency. By mathematical-statistical methods we can identify the most significant factors which influence the talent improvement.

About these future results if we have the chance we shall be ready to speak about on the next ECHA conference.

# **Relationships between Language Aptitude, Verbal Memory, and Learning Orientation**

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## **Introduction**

In the past fifteen to twenty years the field of second language acquisition has grown enormously, with the quality of published research increasing annually.

There are 3 main streams in research (Skehan, 1989):

1. Some studies want to establish how learners are similar, and what processes of learning are universal (e.g. studies of universal grammar, or of acquisitional sequences, or of error types are good examples of this).
2. Other researchers are interested mostly in the differences between learners (e.g. in respect of language aptitude, motivation, cognitive style, learning strategies etc.).
3. In addition, there are studies, which assume individual differences, but which then go on to match particular types of individual with the adequate particular instructional conditions.

With my research I would like to join to the 2nd stream, because my aim is to detect relationships between language aptitude and the various components, which may determine success in foreign language learning. These factors are the following: verbal memory, learning style or orientation, and success/failure orientation. To examine these relationships I used the Hungarian version of the MLAT, a verbal memory test, and the learning orientation questionnaire of Kozéki & Entwistle.

## **Definitions**

*Foreign language aptitude* or language learning aptitude is actually a very complicated concept. It might be defined e.g. as the ability to develop four aspects of communicative competence: grammatical, sociolinguistic, discourse, and strategic competence (Canale, 1983). Carroll put forth a different four factor theory (Carroll, 1981). He stated that language aptitude is not a unitary ability, but consists of four independent abilities:

- Phonetic coding ability: the ability to identify distinct sounds, to form associations between those sounds and symbols representing them, to retain the associations.

- Grammatical sensitivity: the ability to recognise the grammatical functions of words/linguistic entities in sentences.
- Rote learning ability: the ability to learn associations between sounds and meanings rapidly and to retain these associations.
- Inductive language learning ability: the ability to induce the roles governing a set of language materials, to notice and to identify relationships.

The principal measure used to assess foreign language aptitude as defined above is the Modern Language Aptitude Test or MLAT (Carroll & Sapon, 1959). Aptitude test scores are accurate predictors of student achievement, and can provide insights into student ability for placement purposes.

*Learning style* includes a large number of largely unintegrated dimensions, studied in a one-by-one fashion by most researchers. Most styles are broad, but some seem to be specific responses to particular situations or stimuli.

Willing (1988) defines learning style as an inherent, pervasive set of characteristics related to how learners prefer to learn or to deal with new information. Learning style contains many different cognitive, social and affective elements.

Entwistle (1981) created a learning orientation model containing several components (e.g. reproductive, strategic etc. learning orientation). Kozéki (1980) was interested in the role of motivation in classroom achievement. As achievement is influenced by learning style and motivation as well, Kozéki & Entwistle integrated their research in a common study on Hungarian and Scotch schoolchildren's learning and motivational orientations (Kozéki & Entwistle, 1986).

*Memory abilities:* The investigation of memory performances is currently an active area of cognitive psychology (Richardson-Klavehn & Bjork, 1988) and hopefully research on foreign language aptitude will attend closely to the directions of this research. Carroll (1981) attempts to specify what kinds of memories (short-term memory, intermediate-term memory, and long-term memory) and what kinds of memory contents are involved in each foreign language aptitude component. He further considers what cognitive operations and strategies could come into play as a subject successfully performed a typical task presented that measures the given aptitude component.

Cognitive operations can consist of addressing sensory buffers (visual or auditory), addressing (e.g. storing in or retrieving from) different kinds of memory stores, and manipulating information in the executive or short-term working memory. In an other study (Carroll, 1990) he emphasizes the role of episodic and delayed memory, too.

## **The present study**

My study was designed to determine the following:

1. Whether there are any relationships between language aptitude and verbal memory, learning style, and success/failure orientation.
2. How do the relationships of these factors vary in case of
  - male/female students
  - age of 14/18
  - students specialized/not specialized in foreign languages at school.

To address these questions I formulated two main hypotheses:

1. The high level of language aptitude is accompanied by
  - effective verbal memory
  - preference of logical learning to rote learning.
2. Correlations are even higher in case of success oriented female students where age does not play any particular role.

The psychological variables to examine were:

- the four abilities determining foreign language aptitude
- verbal memory
- learning style/orientation
- success/failure orientation.

## Methods

To answer the questions mentioned above I have applied three methods:

- a) the Hungarian version of the MLAT
- b) a verbal memory test
- c) the learning orientation questionnaire of Kozéki & Entwistle.

### *a) The Hungarian version of the MLAT*

The principal measure used to assess foreign language aptitude is the MLAT (Carroll & Sapon, 1959). The test scores are reliable predictors of success by individuals in learning a second language through a traditional syllabus in a formal classroom environment. In order to measure foreign language aptitude in case of Hungarian students I had to prepare its Hungarian version. In this work I collaborated with different experts (linguistics, foreign and Hungarian language teachers etc.) and recently published critiques of the MLAT have also helped me (McInnis, 1986; Carroll, 1990).

### *b) Verbal memory test*

Knowing that several memory abilities are involved in foreign language learning I prepared two tasks to measure them:

1. The first task contained a list of words (25 items) to assess memory related to separated words. The list had been read two times to the subjects and then they had to write the words they remembered.
2. The second task consisted of a short coherent text to assess memory related to logical materials. Subjects listened to it twice and they had to write it down as exactly as they could.

### *c) Learning orientation questionnaire (Kozéki & Entwistle)*

This questionnaire has been created to assess students' learning orientation, motivation, and success/failure orientation as well. It contains 60 statements and students have to indicate how characteristic of them each of these statements are.

## Sample and data collection

There were 582 subjects in the quantitative study. Of these, approximately 50% were male/female students, 14/18 years old, and specialized/not specialized in foreign language. Data were collected in 1999: we visited elementary and secondary schools and volunteered students to participate in the study. Students could complete all the tasks (2 tests and a questionnaire) at one session within two hours.

## Data analysis – results

I systematically try to detect the relationships between:

1. language aptitude – learning orientation
2. language aptitude – verbal memory
3. language aptitude – variables of the sample (age, gender, specialization).

The main research question posed for this phase of the study was the following: Do significant correlations exist between the factors mentioned above?

Up to now I prepared the analysis of the first relationship:

### 1. Language aptitude – learning orientation

To answer this question I studied the following correlations:

*a) Phonetic coding ability – learning orientation (in general)*

**TABLE 1**  
**Relationship between phonetic coding ability and learning orientation**

			Logical learning	Rote learning
Kendall's tau_b	ARABOE	Correction Coef.	.102**	-.037
		Sig. (2-tailed)	.001	.243
		N	545	545
	HOLNDOE	Correction Coef.	.091**	-.051
		Sig. (2-tailed)	.007	.137
		N	485	485
Spearman's rho	ARABOE	Correction Coef.	.140**	-.050
		Sig. (2-tailed)	.001	.241
		N	545	545
	HOLNDOE	Correction Coef.	.122**	-.067
		Sig. (2-tailed)	.007	.140
		N	485	485

\*\*Correlation is significant at the .01 level (2-tailed).  
ARABOE, HOLNDOE: phonetic coding ability subtasks

The calculation of the non-parametric correlation shows no relationship between the two variables.

b) Grammatical sensitivity, inductive language learning ability – logical learning

**TABLE 2**  
**Relationship between grammatical sensitivity and inductive language learning ability**

		MONDATR	
Kendall's tau_b	JAPAN	Correction Coef.	.270**
		Sig. (2-tailed)	.000
		N	584
	SZANSZOE	Correction Coef.	.186**
Spearman's rho	JAPAN	Sig. (2-tailed)	.000
		N	544
	SZANSZOE	Correction Coef.	.345**
		Sig. (2-tailed)	.000
		N	584
		Correction Coef.	.345**
		Sig. (2-tailed)	.000
		N	544

\*\*Correlation is significant at the .01 level (2-tailed).

JAPAN, SZANSZOE: inductive language learning ability subtasks

MONDATR: grammatical sensitivity subtask

I examined grammatical sensitivity and inductive language learning ability together because it can basically be proved that they “go together”.

**TABLE 3**  
**Relationship between grammatical sensitivity, inductive language learning ability and logical learning**

		Logical learning	
Kendall's tau_b	JAPAN	Correlation Coef.	.107**
		Sig. (2. tailed)	.001
		N	584
	SZANSZOE	Correlation Coef.	.062
Spearman's rho	JAPAN	Sig. (2-tailed)	.050
		N	544
	MONDATR	Correlation Coef.	.215
		Sig. (2-tailed)	.000
		N	584
		Correlation Coef.	.139
		Sig. (2-tailed)	.001
		N	584
MONDATR	SZANSZOE	Correlation Coef.	.084
		Sig. (2-tailed)	.050
		N	544
		Correlation Coef.	.304
		Sig. (2-tailed)	.000
		N	584

\*\*Correlation is significant at the .01 level (2-tailed).

\*Correlation is significant at the .05 level (2-tailed).

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There is correlation between grammatical sensitivity, inductive language learning ability and logical learning.

c) *Rote learning ability (in connection with foreign language materials) – rote learning (as a learning style in general)*

**TABLE 4**  
**Relationship between rote learning ability (related to foreign language materials) and rote learning (as a learning style in general)**

			LENGYOE	ROTE LEARNING
Kendall's tau_b	LENGYOE	Correction Coef.	1.000	-.008
		Sig. (2-tailed)	.	.820
	ROTE LEARNING	N	447	447
		Correction Coef.	-.008	1.000
Spearman's rho	LENGYOE	Sig. (2-tailed)	.820	.
		N	447	447
	ROTE LEARNING	Correction Coef.	1.000	-.010
		Sig. (2-tailed)	.827	.
		N	447	584

LENGYOE: rote learning ability subtask (for foreign materials)

No correlation can be found between these two variables.

d) *Language aptitude (in general) – success/failure orientation*

**TABLE 5**  
**Relationship between language learning aptitude (in general) and success/failure orientation**

			Success-failure
Kendall's tau_b	SZANSZOE	Correlation Coef.	.068*
		Sig. (2-tailed)	.030
	ARABOE	N	544
		Correlation Coef.	.041
HOLNDOE		Sig. (2-tailed)	.189
MONDATR	N	545	
	Correlation Coef.	.036	
	Sig. (2-tailed)	.289	
	MONDATR	N	485
		Correlation Coef.	.068*
		Sig. (2-tailed)	.017
		N	584

	LENGYOE	Correlation Coef.	.050
		Sig. (2-tailed)	.131
		N	447
Spearman's rho	SZANSZOE	Correlation Coef.	.093*
		Sig. (2-tailed)	.030
		N	544
	ARABOE	Correlation Coef.	.057
		Sig. (2-tailed)	.030
		N	544
	HOLNDOE	Correlation Coef.	.049
		Sig. (2-tailed)	.280
		N	485
	MONDATR	Correlation Coef.	.099*
		Sig. (2-tailed)	.017
		N	584
	LENGYOE	Correlation Coef.	.071
		Sig. (2-tailed)	.134
		N	447

\* Correlation is significant at the .05 level (2-tailed).

There is no correlation between language aptitude scores and success/failure orientation.

## Discussion

The following discussion is based on interpretations of the preliminary findings analysed up to now.

If we examine the relationship between an individual's foreign language aptitude and learning orientation, we can say the following:

- An individual's phonetic coding ability is independent of his or her learning style he or she uses to learn some material.
- Those with higher grammatical sensitivity tend to approach and acquire any learning material in a logical way.
- The same can be stated for those with higher level of inductive language learning ability.
- The level of rote learning ability related to target language material does not influence the individual's applying rote learning in connection with native language material.
- The level of foreign language aptitude is independent of such personality variables as success or failure orientation related to achievement.

## Summary and conclusion

In this paper I have reported my preliminary findings of my study on relationships between foreign language aptitude and certain variables which may determine success in foreign language learning. Until now I prepared the Hungarian

version of the MLAT and examined the nature and extent of intercorrelations between language aptitude and learning orientation.

The primary finding of this study based on the population studied is that the level of certain abilities composing foreign language aptitude determines the individual's learning style related both to native and foreign language materials. However, I must emphasize that the findings reported herein still need further "fine tuning". The analysis of data is being continued in order to answer the additional research questions posed at the beginning of the present study.

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# Ability and Reading Comprehension in the Primary Grades

LÁSZLÓ TÓTH

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My research intends to explore the comprehension development of narrative text in primary grades and the relations between comprehension achievement and some independent variables, especially intellectual ability and creativity. To start the examination I had to decide which kind of comprehension model to use. In general, there are three distinct reading comprehension models: data-driven, conceptually driven, and interactive. Data-driven (or bottom up) processing refers to processing guided by primarily external stimuli. Conceptually driven (or top-down) processing refers to processing guided by one's preexisting knowledge. In interactive processing reading is directed by the text's data and reader's preexisting knowledge as well. I have chosen the interactive approach because I think both of the two processing described above play an important role in comprehension.

However I have not found any studies in literature that described all the elements of narrative text comprehension. That is why I have tried to develop these elements, which are the following: (1) location of data, (2) perception of events, (3) concept formation based on the text, (4) recognition of explicit relations, (5) general world knowledge, (6) drawing inferences and (7) aesthetics and message. The seven areas can be divided into two groups: one is related to direct information of the text, the other is related to indirect information of the text.

After developing areas the next issue was the *text*. In connection with the text two problems can arise: firstly, how can equivalent texts be constructed? The equivalency is very important, because if the texts are not equivalent with each other, than the comparison of comprehension achievements are not possible. But if the texts are equivalent regarding to their length, the number of episodes, the number and complexity of content areas, the number of known and unknown concepts, the number of characters and their traits, the chain of events, the grammar level, the depth of message etc., they cannot be different. They are the same. That is why I decided to use the same text throughout. I suggest that comprehension in different grades does not determine the number of rereading but does the level of information processing.

The second problem was the quality of the narrative text. I had to find a text that was interesting for students in all grades and which had a more complicated message. Finally I have chosen a short story titled "The Pearl of Love" written by

H. G. Wells. The story is about a young prince who had a beautiful wife. But one year after their marriage a poisonous sting killed her in a grove. The prince loved his wife deeply, so he decided to establish a monument to remind all the people in the country to their wonderful love. He began to build a monument around the sarcophagus, in which the body of his beloved wife rested. He said: "Let the name of this building be The Pearl of Love." The Pearl of Love increased continuously year after year. The young prince became a matured, serious man. He did not concern himself with his country any more, he devoted all his time the building and decorating of the monument. When he felt he had finished it, The Pearl of Love was a gigantic palace with absolute beauty. But the prince noticed that something disturbed the harmony. The sarcophagus was too little to the extent of the building and did not fit into the palace. The prince meditated on this problem for a long time. Finally he ordered his servants to move out the sarcophagus.

The next problem was the evaluation of the students' answers related to the questions based on text comprehension, because answers for some questions could not be directly found in the text, they required external preexisting knowledge, inferring and forming opinion, briefly: interpretation. The problem was how to eliminate my subjectivism in the course of interpretation. For this purpose I had asked a group of university students studying Hungarian literature to answer these questions and I selected the most probable interpretations from their answers.

The research has begun in three primary schools of Debrecen with approximately three hundred schoolchildren. The first survey was conducted in the second grade when the children had already been able to read. Of course the same children took part in the next surveys, because it was a longitudinal study. The children could use the text as they wanted to, and there was no time limit in work. Let us see the results.

#### **Area of data location**

There were three questions on the worksheet related to a particular object, a period of time and a point of time. The percentiles show the students' achievement related to maximal achievement. (Table 1)

**TABLE 1**  
**Student achievement: data location**

Questions	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
Object	4.33%	11.93%	26.53%
Period of time	6.86%	32.98%	39.80%
Point of time	7.94%	32.98%	49.82%
Average	6.38%	25.96%	38.55%

As you can see it was more successful to give answers to the questions related to time in all the three grades.

### **Area of events**

Three questions in the worksheet intended to assess students' perception related to the main events of the story. The first question was connected to an important event, which was the starting point of the story (the death of the prince's wife). The second and third question related to events happened *before* a concrete event and *after* a concrete event.

Although the recognizing of event *after* (the moving of sarcophagus) is inevitable to the comprehension of the story, it was less successful than recognizing the event *before*. (Table 2)

**TABLE 2**  
**Student achievement: events**

Questions	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
A striking event	65.70%	82.81%	82.99%
Before	10.47%	23.85%	43.20%
After	2.89%	10.53%	24.15%
Average	26.35%	39.06%	50.11%

### **Area of concepts**

Here I wanted to see how children could understand particular concepts of the text. I supposed that if these concepts were unknown for the children, the context would give some help. But according to data my hypothesis was false. Moreover I found low correlation between concept production and message production. On one hand it means that the knowledge of all the concepts in the text is not necessary to the comprehension of the message, on the other hand it means that if someone knows the meanings of all the concepts in the text, there is not any guarantee that he or she can comprehend the message. Results (Table 3):

**TABLE 3**  
**Student achievement: concepts**

Questions	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
'Grove'	6.14%	12.28%	18.37%
'Immortal'	0.00%	1.05%	6.46%
'Superhuman'	1.44%	3.86%	11.22%
'Sarcophagus'	5.50%	1.05%	1.70%
'Harmony'	0.72%	2.11%	4.42%
Average	2.67%	4.07%	8.44%

### **Area of explicit relations**

Here I asked for casual relations explicitly embedded in the text. For example one sentence involved a certain part of the relation, the next sentence involved the another part of it. So the students even could copy the right answers. Results (Table 4):

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**TABLE 4**  
**Student achievement: explicit relations**

Questions	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
The soaring of fantasy	0.72%	6.32%	11.22%
The small size of the sarcophagus	3.45%	20.00%	35.03%
The incompleteness of the work	1.44%	7.72%	11.56%
Average	1.81%	11.35%	19.27%

### **Area of general world knowledge**

Here I examined the students' preexisting knowledge relevant to comprehension. I thought the background knowledge could help students to understand the progress of the main character turned to a negative direction. As the table shows the exceeding of knowledge was not continuous. Generally we can state that students in the 4<sup>th</sup> grade did not know more about these things than a year ago. Results (Table 5):

**TABLE 5**  
**Student achievement: world knowledge**

Questions	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
Doings of a king	2.35%	21.75%	29.76%
The fate of a nation	3.43%	13.68%	9.35%
Possibilities of dependants	5.05%	34.39%	24.15%
Average	3.61%	23.27%	21.09%

### **Area of independent inferring**

Here the questions required independent inferring or subjective interpretation based on the text. The first question was a symbol interpretation (What can the 'pearl' be in the expression: The Pearl of Love?). The second question asked the reasons for change of the main character (Why has the prince changed during the building?). The third question related to the motivation of activity of the main character (Why did the prince want to create the absolute beauty?). According to data at the beginning there had been a significant development in achievements in the 3<sup>rd</sup> grade but this tendency stopped later. Results (Table 6):

**TABLE 6**  
**Student achievement: independent inferring**

Questions	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
Symbol interpretation	6.86%	33.68%	24.49%
Motivation of inner change	0.00%	13.33%	9.18%
Motivation of goal striking	2.71%	23.51%	16.84%
Average	3.19%	23.51%	16.84%

### **Area of message interpretation**

Here I wanted to explore the extension of students' comprehension related to the message of the story. The students' tasks were to form judgements about (1) the main character, (2) the building itself and (3) the name of the building. These tasks were rather difficult as the story described the main character as a positive character who deeply loved his wife. However, his character has got negative sides as well, because he had forgotten her while building the monument. The building seemed to be wonderful, but it had no function without the sarcophagus. The name of the building – The Pearl of Love – seems to be adequate, but it represents complex feelings: positive and negative as well. The reader can comprehend the message of this story only in case of recognizing the relation between form and content. The contradiction can be eliminated, if the reader perceives that the story is embedding with irony. The results show the difficulty of these tasks. (Table 7)

**TABLE 7**  
**Student achievement: message interpretation**

Questions	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
Attributes of main character	1.20%	19.65%	8.28%
Attributes of building	0.24%	19.65%	6.69%
Name of building	0.00%	7.37%	3.97%
Average	0.48%	15.56%	6.31%

The Table 8 summarizes the results on the seven areas.

**TABLE 8**  
**Student achievement: summary**

Areas	2 <sup>nd</sup> grade	3 <sup>rd</sup> grade	4 <sup>th</sup> grade
Data location	26.35 %	39.06 %	50.11 %
Events	6.38 %	25.96 %	38.55 %
Concepts	2.67 %	4.07 %	8.44 %
Explicit relations	1.81 %	11.35 %	19.27 %
General knowledge	3.61 %	23.27 %	21.09 %
Independent inferring	3.19 %	23.51 %	16.84 %
Message interpretation	0.48 %	15.56 %	6.31 %

Generally we can state that the ability of processing of direct information has developed continuously, but the ability of indirect information processing has not followed it. With other words, though students in 4<sup>th</sup> grade could deal better with the elementary pieces of information, they did not comprehend better the message of the story than a year earlier. Regarding the main hypothesis of my research, there is some evidence that it is not the number of rereading but the level of information processing which determines story comprehension.

The next issue was the effect of independent variables on the students' achievement. Here I examined the role of general intelligence and creativity.

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Let's look at the role of general intelligence, which has been measured by the Raven Test. I supposed that gifted children comprehended the story better than children with average abilities did. However the results have been surprising. (Table 9)

**TABLE 9**  
**Reading comprehension and intelligence measured by Raven Test**

	Area	Correlation	t	p
2 <sup>nd</sup> grade	1.	0.010	0.163	—
	2.	0.093	1.469	—
	3.	0.001	0.002	—
	4.	0.210	3.389	<.01
	5.	0.086	1.395	—
	6.	0.126	2.009	<.05
	7.	0.019	0.298	—
	1. + 2. + 4.	0.116	1.841	—
	5. + 6. + 7.	0.130	2.068	<.05
	1.	0.241	3.748	<.001
	2.	0.120	1.819	—
3 <sup>rd</sup> grade	3.	0.228	3.543	<.001
	4.	0.074	1.125	—
	5.	0.043	0.655	—
	6.	0.179	3.034	<.01
	7.	0.094	1.425	—
	1. + 2. + 4.	0.216	3.335	<.01
	5. + 6. + 7.	0.155	2.368	<.05
	1.	0.201	3.332	<.001
	2.	0.196	3.247	<.01
	3.	0.149	2.450	<.05
	4.	0.162	2.663	<.01
4 <sup>th</sup> grade	5.	0.086	1.406	—
	6.	0.120	1.959	—
	7.	0.157	2.572	<.05
	1. + 2. + 4.	0.263	4.427	<.001
	5. + 6. + 7.	0.173	2.843	<.01

The correlation between achievement in comprehension and general intelligence was near to zero, so the relation was negligible. Based on this correlation I can state that gifted children do not comprehend the story better than children with average abilities do. We can ask whether it is possible that general intelligence does not play a role in text comprehension. I think the problem is related to the method of intelligence testing. As I mentioned to assess intelligence I had used the Raven Test. It provides a relative quick and cost-effective measure. But the Raven Test is a nonverbal test and does not say anything about the level of verbal ability although text comprehension requires primarily verbal ability. Thus I suppose that the correlation near to zero is misleading because the Raven Test is not suitable to assess the abilities taking part in reading comprehension. I believe it would have been better to use other testing method e.g. the verbal subtests of Wechsler Test, but as it is known the Wechsler Test is not a time-saving and cost-effective method especially on large samples.

The other independent variable was creativity measured by the Torrance Tests of Creative Thinking. According to data there was not any correlation between reading comprehension and creativity (Table 10).

**TABLE 10**  
**Reading comprehension and creativity measured by TTCT**

	Area	Correlation	t	p
2 <sup>nd</sup> grade	1.	-0.061	0.961	—
	2.	0.115	1.832	—
	3.	-0.020	0.317	—
	4.	0.009	0.139	—
	5.	0.145	2.311	<.05
	6.	0.065	1.021	—
	7.	-0.022	0.349	—
	1. + 2. + 4.	0.052	0.816	—
	5. + 6. + 7.	0.121	1.928	—
	1.	0.084	1.266	—
	2.	0.081	1.225	—
	3.	0.109	1.651	—
3 <sup>rd</sup> grade	4.	0.093	1.403	—
	5.	0.097	1.464	—
	6.	0.114	1.728	—
	7.	0.050	0.754	—
	1. + 2. + 4.	0.119	1.804	—
	5. + 6. + 7.	0.122	1.861	—
	1.	0.027	0.433	—
	2.	0.023	0.369	—
	3.	0.089	1.442	—
	4.	0.027	0.438	—
4 <sup>th</sup> grade	5.	0.121	1.974	<.05
	6.	0.023	0.381	—
	7.	0.144	2.363	<.05
	1. + 2. + 4.	0.036	0.581	—
	5. + 6. + 7.	0.142	2.333	<.05

When I have selected total creativity to verbal and performative ones, I have not found any difference. It means that creativity measured by TTCT has no significant impact on text comprehension. Vice versa, the level of text comprehension cannot be a predictor of creativity.

Research presented here represents a relatively undiscovered area for two reasons. Firstly, several studies have been conducted in connection with reading comprehension, but longitudinal studies have been lacked world-wide. Thus our knowledge on development of reading comprehension is imperfect. Secondly, we know very little about the characteristics of gifted children's reading comprehension, especially on narrative text. I believe this longitudinal study will provide new data and will contribute to better understanding of the nature of cognitive representation in gifted children.

# Teachers' Opinion about the Nature of Giftedness

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The Department of Educational Psychology has been involved in research work concerning the development of abilities for decades. The development of giftedness became a central issue in our studies during the second half of the 80s. Since then we have had a close relationship with the schools of the region. The practical side of the development of giftedness is helped in a number of ways by our department. The most important ones are the following:

- We help to select talented children by different psychological means.
- We monitor their development by measuring their progress.
- We take part in planning the programs in every semester.
- We have workshops for teachers taking part in the program.
- We organize practical classes to help children to get to know themselves and to find effective individual learning strategies.
- We have lectures and consultation with parents.
- We organize workshops on communication development and pedagogical attitude development for teachers.

Even these few elements of our work show that we consider it to be important to provide in-service training for teachers who take part in talent developing programs.

As a result of our intensive cooperation with schools it tuned out that there was a need for systematic in-service training so that teachers could go on with the program. So in 1992 we started our first postgraduate course named "psychological bases for the development of giftedness."

It consisted of 120 classes. This September we began the third such course, and teachers are increasingly interested. The colleagues at the Department of Psychology of HAS, especially Mária Herskovits, who is a well-known Hungarian expert in this field, contribute a lot to our work. We discuss the following questions:

- an up-to-date interpretation of talent;
- the methodological problems of selecting talents;
- the role of school programs in the development of talent;
- the cooperation of school and family;

- the importance of advice and its forms;
- talented students with unsatisfactory achievement;
- creativity and verbosity;
- pedagogical attitude and talent development;
- special talent development (music, mathematics, foreign language);
- international aspects of talent development;
- studying practical workshops of talent development.

To give information about Hungarian and foreign researchers we not only organize consultations but we also edited a two-volume collection of texts, and the third volume is just being prepared (Balogh & Herskovits, 1993).

In our present lecture we would like to highlight what teachers thought of the main problems of talent development as a result the course they attended. We gained information with the help of structured questionnaires and informal interviews with the participating teachers. (Questionnaire will be shown later.)

The questionnaire can be divided into two major parts. Some questions concern the theoretical background of the 120-class in-service training (e.g. how to define what a gifted child is like, how to treat a talented child with unsatisfactory achievements etc.).

Other questions concern individual experiences, opinions about gifted children.

We did not mean to test their theoretical knowledge. On the contrary, we were much more interested in what their attitudes are, what they think of today's Hungarian school system and of their own roles as educators. Both in the training and in the questionnaire we had primary school and secondary school teachers.

They came from different types of schools (e.g. musical primary school), so besides dealing with gifted children they face special problems and situations day by day.

They enrolled in voluntary, nobody, not even the headmaster, forced them to participate in the work of the program. They were simply motivated to cope with the requirements of the training. We had 34 people, 33 ladies and gentleman.

We would like to divide our lecture into three further parts:

1. The presentation of the questionnaire
2. The presentation of the results
3. General conclusions, our further plans

As you can see below 1 we wrote different questions that are also related to one another in their contents.

## 1. The questionnaire

1. Give the definition of a talented child. (Also rely on your own experience in your teaching practice.)
2. What subcategories can you set up within the category of "talented child"?
3. Below you find opposing concepts. Circle the number that you think expresses the development of talented children in Hungarian schools.

Individual aspects	1	2	3	4	5	6	7	Aspects of the society
Focusing on students	1	2	3	4	5	6	7	Focusing to subjects
Advice	1	2	3	4	5	6	7	Direct guidance
Working together	1	2	3	4	5	6	7	Teacher's lecture
Student plans	1	2	3	4	5	6	7	Teacher plans
Inner motivation	1	2	3	4	5	6	7	Outer motivation
Learning based on discretion	1	2	3	4	5	6	7	Learning based on strictness
Focusing on development	1	2	3	4	5	6	7	Focusing on results
Independence	1	2	3	4	5	6	7	Teacher dominates
Subjectivity	1	2	3	4	5	6	7	Objectivity
Spontaneity	1	2	3	4	5	6	7	Regulations

4. Which do you think are the most effective ways of developing giftedness at school?
5. What do you think of selecting classes according to talent (school achievement)?
6. How can you get a talented child with unsatisfactory achievement to have better results?
7. What kind of behavioral abnormalities produced by gifted students that you can forgive?
8. Tell the most pleasant experience you had with a gifted student.
9. Tell the most unpleasant experience you had with a gifted student.
10. What should a teacher be like who deals with talented students?
11. What are the means that a family should have to help a talented student to develop?
12. In what fields can teachers and parents cooperate to help a talented student to develop?
13. Besides school what other institutions and activities would you find useful for dealing with gifted students?
14. List some changes that you would make in your own work to deal with gifted students in a more appropriate way.
15. What use the major points that this course has changed in your own opinion in connection with treating talented students?

Participating teachers were given the questionnaires at the end of the course, and they had 90-100 minutes to answer the questions.

The majority of the questions are so open that teachers can list a good number of experiences, ideas, and suggestions without any formalities. They made use of this opportunity, so we have a lot of data at hand to be studied.

In this lecture, of course, we cannot give an absolutely detailed survey. We would rather concentrate on some important questions, typical opinions.

Relying on our connections with a lot of schools and their teachers we can state that what we found in the questionnaires a clear representation of the way of thinking typical of Hungarian primary and secondary school teachers, about life, the treatment of gifted students and its ups and downs.

## 2. The results

Major points in the definition of gifted children

- In some school subject they have much better achievement (70% of teachers answered)
- have outstanding abilities in thinking (70%)
- are motivated (65%)
- are responsive to problems
- know more than the teacher in some fields (50%)
- have a lot of ideas (45%)
- have good imagination (40%)
- have a good sense of humour
- their emotional development lags behind their intellectual development (50%)

It is seen in this list that from their own experiences the teachers used phrases that can be found in the literature of the topic as well.

It is especially important to realize that there is usually a gap between talented children's intellectual abilities and emotional selves (Passow, 1991).

It is a positive opinion that in certain fields talented children know more than their teachers. About half of the teachers asked considered this a significant criterion.

As far as the opposite notions are concerned in question 3 teachers are not of a high opinion in connection with the treatment of giftedness at school.

In our summary chart you can see the average underlined.

Individual aspects	1	2	3	<u>4</u>	5	6	7	Aspects of the society
Focusing on students	1	2	3	<u>4</u>	<u>5</u>	6	7	Focusing to subjects
Advice	1	2	3	<u>4</u>	5	6	7	Direct guidance
Working together	1	2	3	<u>4</u>	5	6	7	Teacher's lecture
Student plans	1	2	3	4	<u>5</u>	<u>6</u>	7	Teacher plans
Inner motivation	1	2	3	4	<u>5</u>	6	7	Outer motivation
Learning based on discretion	1	2	3	4	<u>5</u>	6	7	Learning based on strictness
Focusing on development	1	2	3	4	5	<u>6</u>	7	Focusing on results
Independence	1	2	3	4	5	<u>6</u>	7	Teacher dominates
Subjectivity	1	2	3	<u>4</u>	5	6	7	Objectivity
Spontaneity	1	2	3	4	<u>5</u>	6	7	Regulations

It is obvious at first glance that the averages are on the right hand side. The results, the teacher's activities and dominance is stressed everywhere.

Outer motivations, regulations and subject centeredness are very typical.

These opinions are even more thought-provoking if we think of the fact that gifted students need more spontaneity, independence, less structured tasks directly meant for the individual (Wei-Fan Kuo, 1992). We think that one of the cue notions in the list is result centeredness, which strongly influences some other factors.

We have already observed in several cases (and teachers mentioned it as well) that the psychic tension of gaining and preserving a good reputation of a school falls on a couple of excellent students. There are students that are expected to

represent their schools at town, country and national competitions. This, unfortunately, can lead to exhaustion, indifference and even disgust with studying.

Perhaps we should give more freedom and independence not only to our gifted children but to the others as well.

However, it is not surprising that most of our teachers are aware of this, and they know the forms of effective talent development. It is shown in their answers to question 4. The most typical answers are:

- individual treatment
- announcing school competitions
- study circles, optional subjects
- school radio/TV
- grouping according to ability
- establishing special classes
- visiting bigger libraries, archives (so that they can research)
- going to university lectures

It would also be important to find out what obstacles they might face when carrying out there ideas (e.g. limited financial possibilities at school). And which are the problems that could be solved with a little creativity or resourcefulness.

For us the most interesting question was the 7<sup>th</sup> one. What kind of behavioral abnormalities produced by gifted students that you can forgive?

Let us see a list of the most common answers

- they ask a lot of unusual questions (45%)
- interrupt the teacher's explanations (40%)
- are too critical of others including the teacher (30%)
- deal with other things because of finishing the task sooner than the others (50%)
- read secretly under the desk because the lesson is boring (45%)
- are forgetful: do not bring their things to class or lose things (55%)

The numbers in brackets show that teachers usually shut their eyes to gifted students' faults.

However, one third of the teachers asked were of the opposite opinion.

They are convinced that we must not be too *sympathetic* with gifted students because excellent students need more discipline and self-discipline the lack of which may stop the development of talent. Questions 8 and 9 were interested in the most pleasant and unpleasant experiences with gifted students. In this section most of the teachers recalled cases when they were on good terms with a talented student, they could find a proper way of controlling him/her, and could motivate him/her. There are students whom the other teachers found hopeless because of their extravagant, hardly controllable behavior.

From the answers it seems that such situations are challenging for a teacher. Quite often the good old methods done with routine simply do not work. True pedagogical talent and resourcefulness are required to treat gifted and at the same time non-conformist students so that we can establish a fruitful cooperation with them.

All the negative experiences can be derived from the failure in this field. When the teacher could not influence the student, who therefore gave up the subject or activity.

He/she lost interested in school, did not apply to a university or college and consequently got lost. Most of the teachers were touched by this failure and they were trying to find the mistake in themselves.

Why could not why prevent it?

Question ten is directly connected to these problems, because we asked them to write down the most important qualities of teachers dealing with gifted children.

Our list contains the most important qualities mentioned by the teachers.

- open, accepting things (85%)
- knows a lot of in his/her subject (85%)
- creative, imaginative (80%)
- has a good sense of humour (70%)
- can motivate (75%)
- can adapt him/herself to the requirements of the student (55%)
- has empathy (50%)
- has self-criticism (45%)
- can debate
- enthusiastic, ambitious

From this list it turns out that what they think of an ideal teacher is the same as what we can read in a lot of other studies (Gold, 1979).

All the teachers think that the above qualities apply for teachers dealing with average students, too. It would be ideal for all teachers to have these qualities.

As far as cooperation of teachers and parents is concerned the teachers emphasized that they should have the same values, requirements. Teachers and parents should set goals and find activities together. They should be in touch with each other and meet not only once in several months at teacher-parent meetings, and then talk about their experiences. It should be a day after day relationship.

What out-of school activities and institutions are important in talent development?

- summer camps
- excursion over the weekend with a definite aim (e.g. collecting minerals for students who like biology, geography)
- performances organized by leisure centres (e.g. concerts, lectures on astronomy)
- meeting parents who can speak about interesting things from their own special fields

Fortunately, in many schools these are not simply ideas, they are put to the test. Just to mention one example: the talent development program in Szerencs, which has a teacher-parent club with regular meetings.

Both here and at the Munich conference we had the opportunity to hear about it (Győrik, 1992, 1994).

To finish the analysis of the answers to the questionnaires let me quote a teacher from the course whose opinion is almost a creed and we appreciate it very much.

*"First of all I want to change myself. I have to flexible and capable of developing. I have to keep up with our ever-changing time and youth"*

*so that I can talk to them about everything. All children need different methods, methods, materials to be learnt. But we have to be patient. Today there are lots of courses. We have to go to these courses and give up our old ideas and methods if it turns out that they are wrong."*

### **3. Summary, our further plans**

In our lecture our main aim was to draw a picture through the analysis of a questionnaire of Hungarian teachers' opinions who teach both average and talented students.

We wanted to show what they think of talent development, of its everyday tasks and difficulties and what should be done in the future. We relied on their practical experiences and knowledge they gained at a 120-class course.

As a conclusion we may say that they have a true-to-life image of the situation and they are ready to change. They know their responsibilities, and aware of what a power it has for the future to deal with gifted students and to develop their mental capacities.

We are convinced that such challenges can be faced only with the cooperation and mutual help of psychologists and teachers.

And in this relationship both sides have to know how the other works and with what possibilities.

That is why we find it important to have informal talks with teachers, to organize courses and write questionnaires for them so that we can find out as much as possible about teachers' work and opinions.

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# Mathematical Giftedness and Executive Control

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## Introduction

A basic question of research on mathematical giftedness concerns the existence of a specific underlying cognitive structure (or some specific structures) of mathematical abilities. As an alternative, mathematical abilities are determined by a wide set of various components (Wieczorkowski, Cropley & Prado, 2000). One way to investigate this problem is the use of the psychometric approaches. As an example, in a factoranalytic study Carroll (1993) provided a hierarchical structure of cognitive abilities. In this structure, the elemental cognitive abilities as narrow factors were assembled into 7-8 broad factors (Fluid Intelligence, Crystallized Intelligence, General Memory Ability, General Visual Perception, General Auditory Perception, Broad Retrieval Ability, Broad Cognitive Speedness and Information-Processing Speed). At the top of the hierarchy stands the general intelligence (*g*) factor. Mathematical abilities may be imbedded into the broad structure of cognitive abilities. In Carroll's opinion many elemental cognitive abilities are related to high-level mathematical achievement; therefore these abilities can be regarded as mathematical abilities: *induction, sequential reasoning, quantitative reasoning, language development, verbal or printed language comprehension ability, number facility, memory span, associative memory, meaningful memory* and some factors of General Visual Perception, Broad Cognitive Speed and Information-Processing Speed (Carroll, 1996).

From the standpoint of cognitive psychology the question can be formulated as follows: could the mathematical giftedness reflected the cognitive structure of mathematical abilities originate in *specific characteristic of information processing*? On the other hand, cognitive psychology approaches intend to determine those parts of the cognitive architecture, which have large impact on performance in mathematical tasks. In this respect working memory can be regarded as an important part of the cognitive system. Working memory is involved in the processes of decoding incoming information, of holding intermediate results and of organization reaction. Its roles and functions have been extensively analyzed in research on problem solving, creativity, language comprehension, search, knowledge representation etc. (see Haberlandt, 1997, Eysenck & Keane, 1990). The multiple component model of working memory (Baddeley, 1986) consists of three parts: the *phonological loop*, and the *visuo-spatial sketch pad* as a background storages are dedicated to operating on acoustic, visual and spatial information

in the auditory and visual processes. *Central executive*, the third component is hypothesized to control and coordinate the operation of the working memory. Due to the limited capacity of the working memory, the control function includes resource allocation and response selection.

According to results on gifted children (under 10 years), high level of intellectual abilities is related to the properties of the sensory system and to the capacity and efficiency of the memory system (Schneider & Pressley 1997). There are differences between gifted and average children in the speed of the processes of information registration, identification and analysis and the processes of storing information in memory and memory retrieval. These results suggest that “the superiority of gifted children may be attributed to higher cognitive efficiency, i.e., to a higher basic speed of information processing and higher level of automation” (see Perleth, Schatz & Mönks, 2000, p. 304.). Similarly, there are evidences showing that working memory capacity has great importance in successful solution of general intelligence tests (Carpenter, Just & Shell, 1990) as well as for problem solving (Simon, 1975). Nevertheless the involvement of the various parts of the working memory is deserves further investigations. Due to the role the central executive in coordination attentional processes, the level of functioning of this system seems to be especially important in solving mathematical problems. The role of the central executive seems to be especially important.

In the present study we analyze the efficiency of the central executive, and the attentional selectivity in children with excellent mathematical abilities, in comparison to a group of proper (but less excellent) mathematical achievement. We supposed that the differences in quality between the gifted children and the average children in mathematics – which can be recorded, on the phenomenological level in the achievement and in its background that is in the structure of cognitive abilities – could be derived from attentional selectivity and efficiency of the control mechanisms of the central executive. Attentional selectivity is tested by the noise/compatibility (flanker) task, whereas the central executive is tested by using the task-change procedure.

The theoretical background of the study is the multidimensional model of giftedness, developed by Renzulli (Renzulli, 1973, 1986) and expanded by Mönks (Mönks, 1992), according to which giftedness is a constellation of high cognitive abilities (general intelligence, special abilities, creativity), factors of personality (e.g.: motivation) and optimal environment (family, school, fellows).

## Methods

### I. Selection of participants

#### *Subjects*

In the main part of the study 30 children (16 male, 14 female) participated in the *Talented* group, and 31 (15 male and 16 female) in the *Control (Capable)* group. These groups were selected from a sample of 118 children (54 females, 64 males). 36 participants studied mathematics according to a special curriculum. These students were selected in this school by a preliminary examination in their 11<sup>th</sup> or 13<sup>th</sup> year of age. The other participants were students of a secondary school with a

program for gifted students. In this school there was no special program on mathematics.

#### *Materials and methods*

In the selection phase of the study the participant were asked to solve a mathematical test, psychological tests and they completed a questionnaire of demographic items. Furthermore, he teachers were required to report the mathematical ability of the students. The tests were introduced:

- Raven Advanced Progressive Matrices (Raven, 1983) – *productive intelligence*
- Torrance Tests of Creative Thinking (Torrance, 1966) – *divergent thinking*
- Questionnaire for School Motivation (Kozéki & Entvistle, 1983) – *achievement motivation*
- mathematical test – *mathematical abilities/achievement* (To estimate of the level of special mathematical abilities no proper specific test is available. We used a set of mathematical problems which had been originally introduced in a mathematical competition.)
- scale of teachers' estimation – *mathematical abilities and achievement* (In this questionnaire the teachers were asked to evaluate the mathematical abilities and achievements of students in 10 statements from using a scale 0 to 5.)
- scores in mathematics and physics at the end of the term – *mathematical achievement*

#### *Results and discussion*

On Table 1 descriptive statistics of sample is shown.

**TABLE 1**  
**Results (means and the standard deviation of means) of tests in the selection phase (whole sample, males, females)**

		Sample (N=118)	Male (N=64)	Female (N=54)
Raven (%)	Mean	72.08247	76.32	67.29
	Sd.	13.00948	10.56	13.92
Mathematical test (%)	Mean	46.71293	49.92	43.59
	Sd.	18.89698	19.67	17.37
Verbal Creativity (T values)	Mean	52.59344	52.10	53.15
	Sd.	10.48337	11.96	8.59
Figural Creativity (T values)	Mean	57.96408	58.20	57.69
	Sd.	6.89572	7.32	6.43
Interest motivation*	Mean	3.35818	3.33	3.39
	Sd.	0.55052	0.61	0.4
Social motivation	Mean	3.73343	3.67	3.79
	Sd.	0.52060	0.54	0.48
Achievement motivation	Mean	3.77294	3.67	3.89
	Sd.	0.56082	0.56	0.53
Pression	Mean	2.46956	2.51	2.41
	Sd.	0.72667	0.76	0.67

\*By the Reliability analysis of Motivation questionnaire the following items were omitted: 4, 14, 33, 43. The values of Cronbach alpha on the scale: Follow motivation: 0.7994; Interest motivation: 0.8002; Achievement motivation: 0.8514; Pression: 0.7229.

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Correlation matrix of the test results is shown on Table 2.

**TABLE 2**

**Correlation matrix of the indices (RAVEN IQ, MATHematical Sheet's scores, TEACHER's opinion scores, MARKs in Mathematics, MARKs in Physics, VERbal CReativity, FIGural CReativity, INTerest MOTivation, SOCial MOTivation, ACHievement MOTivation, PRESsion). Correlation coefficients and their level of significance.**

	MATHS	RAVEN	TEACH	MARKM	MARKP	FIGCR	VERCR	INTMO	SOCMO	ACHMO	PRESS
MATHS Pearson Correlation	1.000	.556	.434	.463	.496	-.167	.073	.094	.245	.165	-.273
Sig. (1-tailed)	.	.000	.000	.000	.000	.037	.219	.159	.004	.039	.002
N	116	115	113	116	116	115	115	115	115	115	115
RAVEN Pearson Correlation		1.000	.532	.406	.358	-.181	-.025	.120	.120	.085	-.173
Sig. (1-tailed)	.	.000	.000	.000	.027	.394	.102	.102	.184	.033	
N	115	112	115	115	114	114	114	114	114	114	114
TEACH Pearson Correlation			1.000	.671	.476	.033	.068	.001	.022	.025	-.160
Sig. (1-tailed)	.	.000	.000	.364	.239	.494	.411	.398	.398	.046	
N	113	113	113	112	112	112	112	112	112	112	112
MARKM Pearson Correlation				1.000	.737	-.056	.030	.137	.182	.210	-.217
Sig. (1-tailed)	.	.000	.275	.377	.072	.026	.012	.010			
N	116	116	115	115	115	115	115	115	115	115	115
MARKP Pearson Correlation					1.000	-.159	.026	.184	.258	.256	-.168
Sig. (1-tailed)	.	.045	.390	.025	.003	.003	.036				
N	116	115	115	115	115	115	115	115	115	115	115
FIGCR Pearson Correlation						1.000	.506	-.116	-.247	-.202	.191
Sig. (1-tailed)	.	.000	.109	.004	.015	.020					
N	115	115	115	115	115	115	115	115	115	115	115
VERCR Pearson Correlation							1.000	.037	-.060	-.102	-.020
Sig. (1-tailed)	.	.347	.260	.139	.416						
N	115	115	115	115	115	115	115	115	115	115	115
INTMO Pearson Correlation								1.000	.570	.700	-.522
Sig. (1-tailed)	.	.000	.000	.000	.000	.000	.000	.000			
N	115	115	115	115	115	115	115	115	115	115	115
SOCMO Pearson Correlation									1.000	.754	-.467
Sig. (1-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000		
N	115	115	115	115	115	115	115	115	115	115	115
ACHMO Pearson Correlation										1.000	-.479
Sig. (1-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000	.000	
N	115	115	115	115	115	115	115	115	115	115	115
PPRESS Pearson Correlation											1.000
Sig. (1-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000	.000	115
N											115

\*\* Correlation is significant at the 0.01 level (1-tailed)

\* Correlation is significant at the 0.05 level (1-tailed)

As Table 2 shows, correlation is strong among the indices of intellectual abilities (IQ, mathematical sheet's scores, marks in mathematics and physics) and teacher's opinion scores, as well as among the subtests of Creative Thinking and among the subscales of School Motivation questionnaire. However, the correlation among the indices of intellectual abilities, creativity and motivation were low or insignificant.

*The method of classification*

Instead of a multiple cutting method, the basic scores were multiplied by weights (based on the correlation matrix) in such a way that the sum-total became 100 in case of maximal score (scores of Verbal creativity and Pression were omitted). Table 3 shows the results of the weighting procedure.

**TABLE 3**  
**The materials, the maximal score of each materials and the Performance (P) scores**

Test	Maximal score	P score
Raven	36	25
Mathematics	10	25
Teacher's opinion	40	20
Verbal creativity	100	0
Figural creativity	100	5
Achievement motivation	5	5
Follow motivation	5	5
Interest motivation	5	5
Pression	5	0
Mark in mathematics	5	5
Mark in Physics	5	5
Sum-total		100

Classification based on the Performance scores. Participants of the *Talented* group were in the top 25% (see Renzulli, 1986). The *Control* group had a mean Raven result of 69.84%, which was higher than mean of the general population (61.1%), therefore we will refer to this group as *Capable* group. (The Hungarian mean on the Advanced Raven in this age-class is 22 points; it means 61.1%. Percentiles were used because lack of standard method to measure IQ level for 13-14 year old children.) In the *Talented* group the Raven result was 82.7%. The estimated IQ for the Talented group was 156, and in the Capable group it was 138. For the general population the estimated IQ is 115. The means of P scores for both two groups and for their subgroups are on Table 4 shown.

**TABLE 4**  
**P scores of the *Talented* and *Capable* groups**

	N	Mean	Sd
Talented	30	76.82	6.65
male	16	79.64	6.14
female	14	73.60	5.86
Capable	31	64.74	5.04
male	15	65.79	3.59
female	16	63.84	6.09

According to an ANOVA the group x sex interaction was insignificant. Of course, the group main effect was significant [ $F(1,57) = 69.66$ ,  $p < 0.001$ ].

## **II. Selective attention and switch cost**

In order to investigate attentional selectivity, the flanker task (Eriksen, 1995) was introduced. In the present study we introduced a colour discrimination version of the task. In order to investigate the efficiency of the central executive functions, the method of task switch (Jersild, 1927, Rogers & Monsell, 1995, Wylie & Allport, 2000) was used.

### *Subjects*

The subjects of the *Talented* ( $n=30$ ) and *Capable* ( $n=31$ ) groups were selected as indicated in above.

#### *a) Flanker task*

##### *Stimuli and procedure*

The stimuli in the Flanker task were three colored squares in a row, presented in the middle of the screen. The participants were asked to respond as quickly and accurately as possible with one of the two response-keys to the target stimuli. The target stimuli were the squares in the middle, and the participants responded on the basis of the colour of this square. The target square was flanked by two irrelevant coloured squares. The squares (1.5 by 1.5 cm) were seen from the distance of about 65 cm. Each stimulus subtended a visual angle of 7 degrees horizontally and 1.4 degrees vertically. If the colour of the target (middle) square was blue, the subjects responded with one of the response-keys, whereas in case of red square, they responded with the other key. The response keys were 0 (left hand) and 9 (right hand) on a standard keyboard. Stimulus-response assignment was balanced within the groups. If the colour of the irrelevant squares in the lateral positions and that of the target was different, the trial was *incompatible*. In case of target and flankers of identical colour, the trial was *compatible*.

Each stimulus was presented until the subjects responded (timeout was 2000 ms). Inter-trial interval was 800 ms. In the training phase the subjects performed two practice blocks with 10 compatible and 10 incompatible stimuli. In this phase incorrect responses were followed by a feedback tone. In the experimental phase participants performed four blocks of 160 trials each. In two blocks the stimuli were compatible, in the other two blocks the stimuli were incompatible. The order of the compatible and incompatible blocks was counterbalanced within the groups. Completion of the task took 10-12 minutes.

*b) Task-switch**Stimuli and procedure*

The task switch procedure consists of two tasks. In the present study the stimuli of the two tasks were identical, however, the proper reactions required different considerations of the stimuli. In both tasks a single row of black digits was presented in the middle of a green or blue screen. The number of digits in a row varied from 1 to 9, and the value of digits in a row varied also from 1 to 9. Neither the number nor the value of digits was five. All digits in a row had the same value (e.g. 888888, 333, 66, 1111111). Stimulus subtended a visual angle of 0.45-7.7 degrees horizontally and 0.9 degrees vertically from the 65 cm viewing distance.

*Element number task:* If the background colour was green, the participants indicated whether the number of digits in a row were more or less than five. In this task the word DARAB (“number”) was presented in the upper left corner of the screen.

*Digit value task:* If the background colour was blue, the participants indicated whether the value of digits were more or less than five. In this task the word ÉRTÉK (“value”) was presented in the upper left corner of the screen.

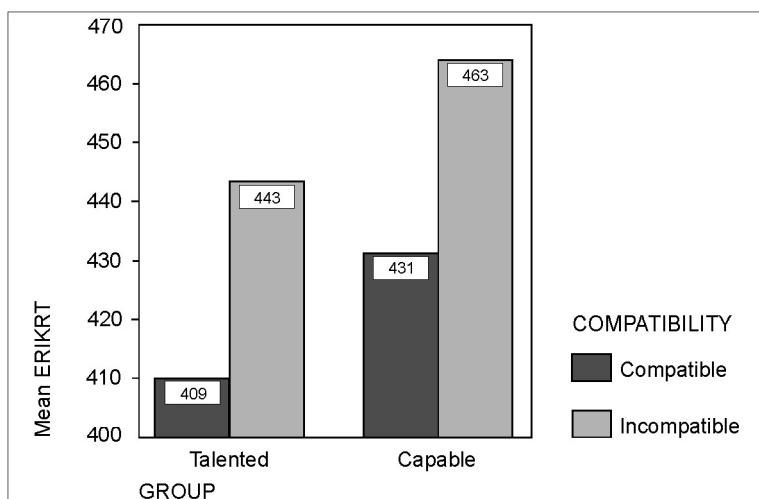
In both tasks there were *compatible* and *incompatible stimuli*, in the sense that certain stimuli required the same response in both tasks (e.g. 1 1), whereas other stimuli required different responses in the two tasks (e.g. 8 8). Compatibility/incompatibility may have effects on RT (Kramer, Gopher & Hahn, 1998). The response key was 0 (left hand) and 9 (right hand) on the standard keyboard. Stimulus-response assignment was counterbalanced within the groups. The participants were asked to respond as quickly and accurately as possible in both of tasks with one of the two response keys.

Stimuli were presented until the participants responded (timeout was 2000 ms). The response-stimulus interval was 800 ms. Trials of the two tasks (element number and digit value) were presented in short alternating sequences. The length of such sequences varied randomly between 8 and 10 stimuli, i.e., after 8-9 trials the task changed. The change of the background colour preceded the presentation of the first task of the sequence by 600 ms. This 600 ms supplemented the 800 ms response-stimulus interval to 1400 ms.

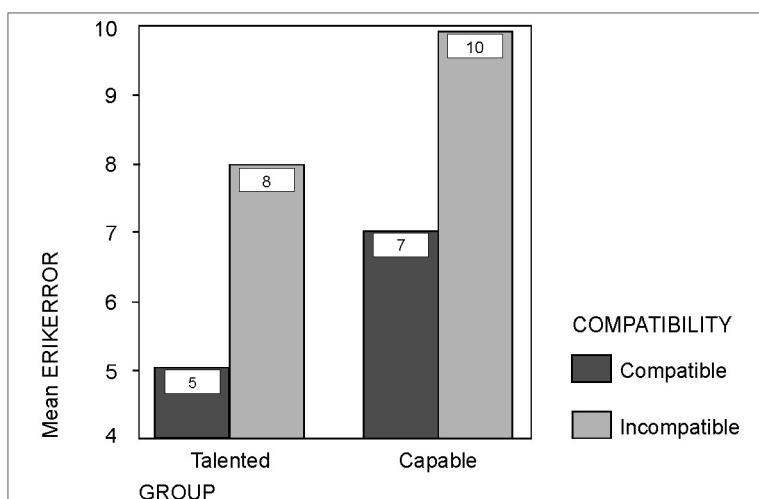
After a practice block the subjects performed four blocks of 710 trials each. The number of the compatible and incompatible stimuli was equal in the two tasks. In the practice phase participants were informed by tone feedback if the respond was too slow it was incorrect. Completion of the task took 15-20 minutes.

*Results: Flanker task*

**FIGURE 1a**  
**RT of two groups (Talented, Capable) for both types of stimuli  
 (compatible, incompatible)**



**FIGURE 1b**  
**Error of two groups (Talented, Capable) for both types of stimuli  
 (compatible, incompatible)**



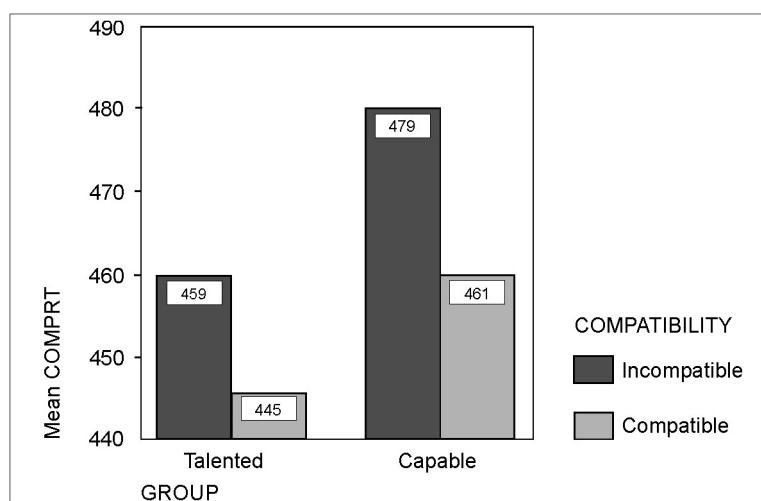
RT data were analyzed in a two-way ANOVA with factors of Group (Talented, Capable) and Compatibility. According to this analysis only the Compatibility main effect was significant [ $F(1,118) = 5.83$ ,  $p < 0.017$ ], i.e. RT was longer when the target and the flankers had different colours. According to a similar ANOVA on the errors both main effects were significant, [ $F(1,118) = 4.67$ ,  $p < 0.033$ ] for the

Group main effect, and  $[F(1,118) = 12.688, p < 0.001]$  for the compatibility main effect. Therefore in case of target-flanker incompatibility the accuracy of responses decreased in both groups, but the error rate was smaller in the Talented group.

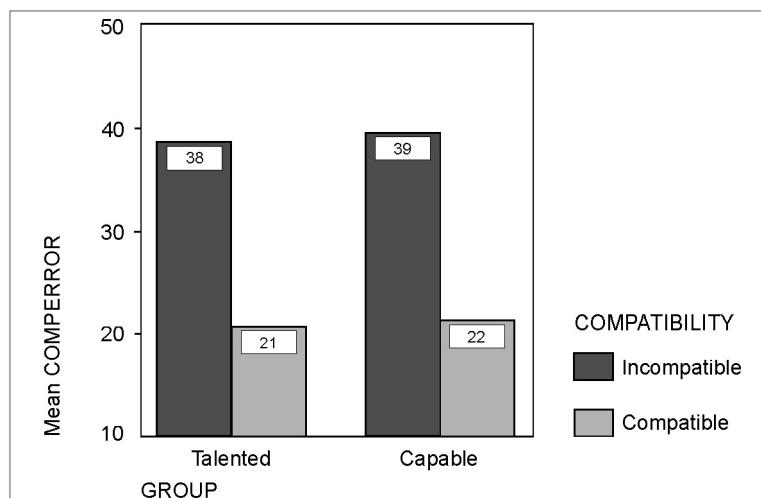
*Results: Task switch*

Compatibility effect:

**FIGURE 2a**  
RT of two groups (Talented, Capable) for both types of stimuli  
(compatible, incompatible)



**FIGURE 2b**  
Error of two groups (Talented, Capable) for both types of stimuli  
(compatible, incompatible)



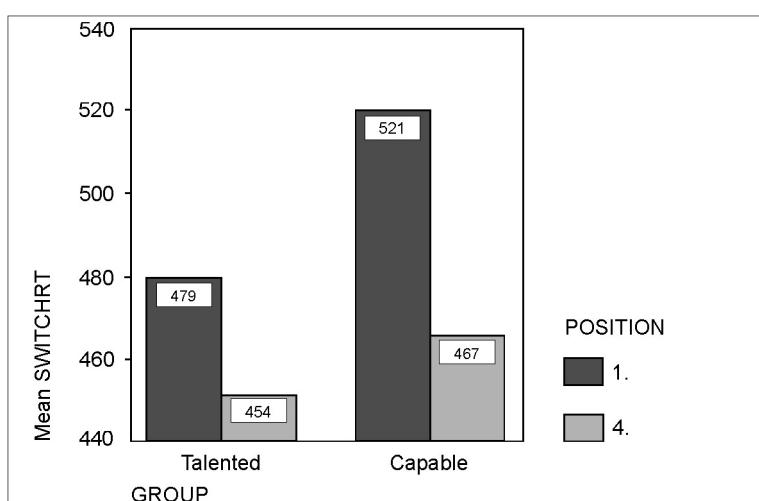
RT was analyzed in two ways. In the first analysis the RT data for the first stimuli of the sequences were omitted. This way a three-way ANOVA with factors of Group, Task and Compatibility was computed. The significant Group main effect shows the generally faster responses of the Talented group [ $F(1, 240) = 4.318, p < 0.05$ ]. RT on compatible stimuli were slightly faster, as indicated by the marginally significant Compatibility main effect [ $F(1, 240) = 3.36, p < 0.07$ ].

The second analysis assessed the switch cost effect. The factors of this three-way ANOVA were Group, Switch and Compatibility. In the Switch factor RT to the first and fifth stimuli of the sequences were compared. (Data of the two tasks were collapsed.). The main effect of Group was significant again [ $F(1, 480) = 15.11, p < 0.001$ ]. The Switch main effect was also significant [ $F(1, 480) = 30.433, p < 0.001$ ]. Most importantly, the Group x Switch interaction approached the level of significance [ $F(1, 480) = 38.16, p = 0.05$ ].

In a three-way ANOVA (Group, Task, Compatibility) on errors only the Compatibility main effect was significant [ $F(1, 240) = 85.942, p < 0.001$ ], showing an increased error rate for the incompatible stimuli.

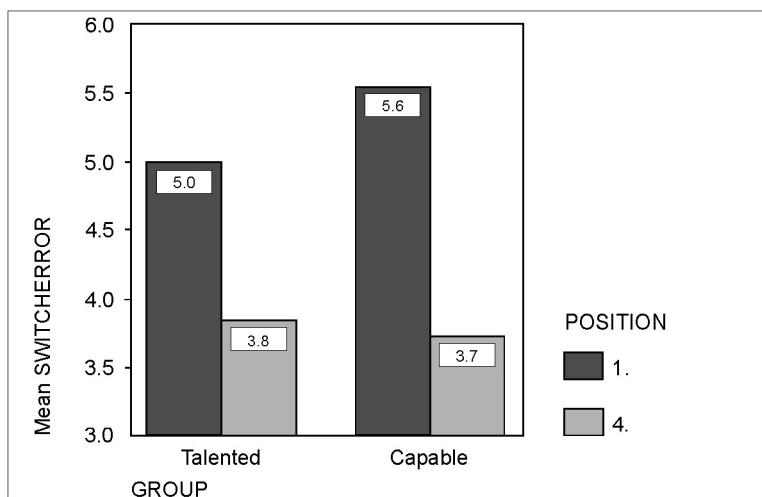
Switch effect:

**FIGURE 3a**  
RT of two groups before (position: 4) switch and after (position: 1) switch



Concerning the error rate, significant Switch [ $F(1, 480) = 41.886, p < 0.000$ ] and Comp [ $F(1, 480) = 75.985, p < 0.000$ ] effect were found. The Group main effect was not significant. There was no difference between two groups. When the task changed the error rate increased. When the stimuli were incompatible, the error rate was higher. There was significant Swith x Comp interaction [ $F(1, 480) = 4.222, p < 0.0400$ ]. According to this interaction higher error rate occurred when the first stimulus of a sequence was incompatible.

**FIGURE 3b**  
**Error of two groups before (position: 4) switch and after (position: 1) switch**



## Discussion

In this study two tasks were administered. The flanker task is a relatively simple one. We obtained the classical results of the task. In the presence of incompatible irrelevant (flanker) stimuli RT increased. The effect of the flanker was similar in the two groups, and the general level of RT was also similar. However, in order to achieve these RT results, the Talented group committed less errors than the control. This difference can be conceptualized as a speed/accuracy group difference. This way the results of the flanker task may indicate a slightly faster information processing system in the Talented group. On the basis of the results of the Switch task, this statement seems to be more reasonable. In this task the RT was clearly faster in the Talented group. In this respects the results of our switch task were similar to the results of other studies (Kramer, Gopher & Hahn, 1998). We obtained a switch cost of considerable magnitude, and RT in the compatible trials was faster than the RT in the incompatible trials. Therefore the decreased switch cost of the Talented group can be attributed to the manifestation of a more efficient central executive system. Further research is needed to clarify, whether this difference is due to a generally faster processing system, or this difference is specific to the central executive.

It should be noted, that in this study the results of a gifted group was compared to the results of a group well above the cognitive level of the average population. Therefore the use of laboratory tasks of information processing seems to be promising in the analyses of differences within higher levels of cognitive functioning.

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## **Part Two: Programmes**



# **Programmes and Practices of Gifted Education in Eastern Europe and the Balkans**

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## **Introduction**

Eight countries of Eastern Europe and the Balkans have supplied us with material concerning their programmes and practices of gifted education. In general, we can state that almost every country recognises this topic in a law or act – usually the Act of Education -, which regulates the issue of high ability in the given country. The scope is very broad: some prescribe talent nurture as obligatory for state organisations (ministry, public schools, etc), others only mention it for calling it to the attention of them. These acts were mainly created in the last decade, relating to the programs of political changes. This can be traced back on the individual countries, their gifted education shows significant progress. Most of these countries had a tradition of a ‘disguised’ type of nurturing high ability in the communist era in the form of special classes, workshops and courses. Despite the ideology of “Everyone is equal”, talents obtained special nurture. Traditional fields of focus were sports, arts and sciences. Based on these roots, work forms have made a significant development in the 90’s. In the background, scientific research in Eastern Europe has improved as well. Several countries have joined the ECHA participating actively in its work and applying practical knowledge gained there in their home countries. One of the greatest obstacles in the further improvement is the lack of a systematic special training for teachers in the gifted education (there is only one country where they have launched a postgraduate programme Teacher in Gifted Education. Another big problem in broadening the scope of programs is limited financial means. Progress has been remarkable despite all problems, and if this raising tendency is maintained for the future, differences between Eastern and Western Europe will fade in some years’ time...

## **Bulgaria**

An important aspect of the Bulgarian school system is that the Article 43 of the Law of Education claims that the Ministry of Education and Science provides conditions for the identification and development of the gifted. In the last decade significant changes can be observed: foundations and other non-state organisations have emerged and several new programs have been organised.

We have to mention special schools as forms of gifted education mainly active in the fields of arts, mathematics, sciences and languages. Some of them have

already been founded in the 60's but there is a big increase in their number recently. These schools provide more study hours and a greater amount of varied knowledge in the given field. Ordinary schools have special classes in mathematics, informatics, sciences and languages. After Grade 7 children have a choice of certain faculties (optional subjects) which provide extension and enrichment of the common curricula matching the child's interest fields. Bulgarian experts aim at providing a rich professional background for the development, which is reflected in the studies, published recently (Jakova, 1992; Stoycheva, 1992; Trifonova, 1992; Stoyanova, 1995; Kaftandjieva, 1996; Milanova, Kamburova, 1996; Stoycheva, 1996). Competitions are regularly held for the able children on local, regional, national and international levels. Among the awards we can find admission to universities, to arts or sports academies. Award-winners of international competitions are often interviewed in the media and are acknowledged in other ways as well. The St. Cyril and St. Methodius International Foundation presents its award for contribution to the identification and encouragement of young talents to teachers of mathematics, chemistry and biology. Ordinary schools focus more alertly to talented pupils than before. There are several programs worked out by individual teachers or teams of teachers, and these often create educational centres. Between 1979 and 1989 the Ministry of Education was organising an international seminar on modern trends in education, with special focus on giftedness and creativity. This stimulated more than 30 schools to launch special programs for the education of the gifted. Between 1982 and 1987 the method of De Bono for teaching thinking skills have been adapted in many schools under the auspices of the Ministry of Education. There are a variety of extracurricular programs for high ability such as clubs, summer camps, summer schools, festivals, shows, and exhibitions. The number of private and non-governmental organisations has increased in the last decade. There is no official mentorship programme but teachers often cooperate in gifted education. The basic training of teachers does not include a systematic preparation for talent nurture though they are given some relevant information. However, there are often postgraduate programs dealing with high ability (Jakova, 1996).

Private organisations often participate in gifted education programs. The already mentioned St. Cyril and St. Methodius International Foundation plays a very active role in the education of the youth, in their vocational training and career planning in Bulgaria. The 1997 Reference Book of Non-governmental Organisations issued by the Union of the Bulgarian Foundations and Associations contains data on more than 20 non-governmental organisations which include talent nurture, teacher- and parental training among its aims. Hopes stand high that the importance of these will continue to grow in the already beneficial environment of giftedness in Bulgaria.

### **Croatia**

High ability is recognised by the Croatian government on pre-school and elementary school levels. They endorse a national pre-school programme for the devel-

opment of high abilities. In the elementary education this work is regulated by the Code of Practice for Gifted Students (1991). This Code addresses the following fields: areas of giftedness, identification methods, programs for enhancing and nurturing giftedness, and methods for the follow-up of gifted children. The current situation had some roots in the times of Yugoslavia but most of the activities were co-ordinated and supervised by the Ministry of Employment and its services (i.e. State Employment Offices and Vocational Services).

The most important fields where practical development takes place are fine arts, mathematics, sciences and sports (Arambasic, 1996; Vizek, Vidovic, 1996). Able students attend extra classes within the regular school setting. These are extracurricular classes specially organized in the above mentioned fields. This form of developmental work has several types and is based on a thorough professional background (Sekulic, Majurec, 1992; Vizek, Vlahovic, 1992; Vlahovic, Stetic, 1992; Sekulec, Majurec, 1996; Cvetkovic, David, 1996; Kolesaric, Koren, 1996). There are several special summer schools and courses for talented pupils such as in mathematics, fine arts, literature, and astronomy lasting for 1-2 weeks. Mentorship system exists at secondary school level. Mentors are appointed teachers from the school staff and usually prepare able students for national and international competitions. In elementary schools competitions are highly valued as means of gifted education. They are organised in all subjects and are highly respected for their awards such as scholarships for grammar schools or universities. There is no special programme for the training of gifted education, but this topic is sometimes addressed by further training programs.

As it can be seen above, high ability is recognised by the government, however, there is still a lack of financial and organisational support, and inadequate teacher training is also an obstacle. There are some private civil initiatives promoting gifted education such as the parental organisation 'Smarties', where special pre-school activities are organised for the fostering of child creativity and ability. For talents in performance arts youth drama centres were established. In 1998 the Croatian Psychological Association founded a special division within its framework which is dedicated to the promotion of giftedness.

## Hungary

Hungary recognises the necessity of talent nurture in several laws and acts of government. These are: the 1993 Act of Public Education, the 1995 Act of Higher Education, the 1996 Regulations of the Development of Public Education, etc. Accordingly giftedness has made significant progresses in the last decade. This development has some traditions in Hungary: already in the early 20<sup>th</sup> century talent nurture was in focus, and after the second world war teachers and experts have paid attention – even if sometimes not explicitly – to the development of the gifted.

Beside public schools, private schools and schools maintained by churches and foundations also participate in practical developmental tasks. Before the 80's schools built up the organisational frameworks for talent nurture, which function

even today. These are special faculty groups, workshops, and special classes. These are common forms in both elementary and secondary schools. The most successful special fields are arts, mathematics, sciences and sports (Laczó, 1992; Majoros, 1992; Harsányi, 1996; Süle, 1996; Kárpáti, 1996; Páska, Kerekes, Fekete, 1997). Since the late 80's so-called complex developmental programs have been implemented in schools. These have focused not only on skills and abilities development but also on the personal background of the individual (Balogh, Nagy, 1991; Czeizel, 1995; Oppelt, 1995; Balogh, Nagy, 1995; Balla, Hanói, Molnárné, 1996; Balogh, Dávid, Nagy, Tóth, 1997). Basic arts schools (fine arts, music, dance, etc.) have a special position in Gifted Education. Sports talents are catered for in special classes of elementary schools and also in the region-based sports schools. High ability is also advanced by the existence of special colleges, whose activities facilitate equal rights in education. The tutorial system is becoming an established form of talent nurture: professors, outstanding researchers help secondary pupils participate in research work. These activities are organised by the big universities. The school system has a long tradition of local, regional and national competitions. One of the most significant competitions is the National Academic Competition of Secondary Schools, where the awarded win admission to universities. The number of competitions for elementary schools is increasing as well. In higher education we can witness a renaissance of 'faculty colleges' gathering the most able students of certain academic fields and supplying them with special programs to facilitate their development. This dynamism of the last decade has been reflected in research work as well: studies have been published in increasing number all over the country at universities, colleges and research institutions. These are helpful points of reference for effective advancement (Gefferth, Herskovits, 1991; Herskovits, Gyarmathy, 1995; Páska, Dávid, 1992; Bóta, 1996; Dávid, Páska, Vitális, 1996).

The above achievements have been accompanied by the focus on high ability in in-service trainings of teachers in the 90's, and the Kossuth University launched the Teacher of Gifted Education Programme in the year 1997/98. This is a four-semester postgraduate in-service training of more than 600 hours based on the training programme of the ECHA Diploma of the University of Nijmegen. Training of parents is becoming more and more common as well (Dávid, Balogh, 1997; Győrik, 1992; Herskovits, 1996; Varga, Gyarmathy, 1996).

Beside the system of education, other public institutions also take their part in talent nurture (culture centres, community centres, etc.). Children movements also address special fostering of high ability. Adult civil organisations endorse talent nurture in parts or all of their programs. Some outstanding organisations are: Hungarian Association for High Ability, Corporation for Public Academic Activities, Bolyai Association, MENSA, Hungarian Association for Professional Training, etc. The number of foundations fostering the development of giftedness has recently increased. The establishment of regional giftedness centres is planned. These would facilitate activities of identification of the gifted and special programs. The first of these centres is already established in Budapest. If dynamism remains the same in the following years, gifted education will become comprehensive in Hungary and will cover up the white spots which still exists in the country.

## Poland

Gifted education is recognised by the government on elementary, secondary and higher education level as well. The first act on high ability was passed in 1991. This was preceded by certain activities, however, these were not comprehensive or well-organised forms of talent nurture.

Within practical developmental programs, music, mathematics and visual talent are given priorities (Kepinska, Welbel, 1991; Limont, 1992a, 1992b; Klimas, Kuchtova, 1996). In these fields gifted education begins in elementary schools already. Children have special ballet and sports classes. Secondary education focuses on music, ballet, fine arts and social sciences beside mathematics. Highly able students have special classes after school. The Polish Children Fund (PCF) organises special summer schools and courses for the gifted. These are most often held on fine arts and other arts. The PCF also prepares special meeting and workshops on languages, History, Astronomy, Physics, etc. Talented pupils can meet adult experts of their interest fields. PCF also organises mentorship programs. These activities have a firm professional basis, research in the field of giftedness is significant in Poland (Sekowski, 1995; Limont, 1995; Strelau, 1992; Necka, 1996; Niebrzydowski, Poraj, 1996; Mendecka, 1996a). The system is appealing and effective for children. Elementary school children can swap one or two classes, secondary school children can attend secondary schools and universities at the same time. The scope of competitions is broad: 24 competitions in the fields of Art, Astronomy, Biology, Chemistry, Philosophy, Physics, Geography, History, Information Technology, languages: English, White Russian, French, Latin, German, Russian, Polish, Mathematics, Ecology, Economy, Technical Sciences, Polish Studies, Universal History, Human Laws, Agriculture, Nursing. Some of these are held both for elementary and secondary school children, others are organised for secondary schools only. Winners of primary school competitions have free admission to secondary schools, and winners of secondary school competitions obtain several priorities at universities.

There is no special training of teachers in gifted education, however, high ability is often discussed in further trainings and parents can also find developmental, attitude-shaping programs (Mendecka, 1996b; Swietochowski, Poraj, 1996; Ledzinska, 1996; Niebrzydowski, 1997).

## Romania

In Romania the latest Act of Education was passed in 1995. This Act endorses the recognition of gifted education in primary, secondary school and university levels. It includes chapters about the acceleration of school education, launching special classes, requirements of identification and nurture, special conditions for university admission and special resources of gifted education. They are still at the early phase of the implementation, they face a lot of problems that they should resolve, and it would be advisable to establish a special department for high ability in the Ministry of Education, which could co-ordinate these activities. Traditions of gifted education go back to the beginning of the century. Acts as early as 1904

and 1939 have recognised giftedness as an issue. After World War 2 special classes meant the framework for talent nurture.

Priority is given to arts (music, folklore), sports, informatics, mathematics, physics, biology in the actual developmental work. New areas of focus are communication skills, leadership and creativity. Special schools of arts and sports can be found in almost every bigger town, and the number of secondary schools with special informatics, language, mathematics, physics and sciences classes is also large. Ordinary schools do not often use differentiated education. A common problem is that it is hard to actually carry out the theoretical ideas in practical development. Summer courses are common - not only in ministerial organisation but also in private areas, where RO-Talent has a leading position. Competitions take regularly place for pupils from Grade 5 and in secondary schools, in school, regional and national levels. Able children also participate in international competitions. The awards are valuable: winners can obtain foreign trips, admission to universities. Unfortunately, these competitions often lack a pedagogical basis. However, the need to carry out activities with a solid professional basis is increasing (Cretu, 1992a; Cretu, 1992b; Lazar, 1992; Cretu, 1995; Cretu, 1996). Teacher trainees obtain some introductory courses in psychology and pedagogy about gifted education. The Iasi University has an obligatory course in this topic in its curriculum. Further education of teachers depends on the local authorities' policy. These are mainly organised by the "Casa Corpului Didactic".

To sum it up we can claim that high ability is in the focus of Romanian educational policy, but the implantation of this in practice is often missing. Major reasons for this are lack of professional knowledge and information, a ban on the Pedagogy and Psychology Programs at universities between 1970 and 1990, no priority in obtaining financial support, lacking competence and organisation for talent nurture, countries who were examples for the educational model of Romania (e.g. France) do not have special programs of high ability but include this topic in their general educational policy. However, some new trends have appeared, which we see as optimistic signs: research work is strengthening in Romania (Institute of Educational Sciences, Bucharest), launching an additional programme for teachers in the education of the gifted in Iasi, several doctorate theses at the universities in Iasi, Bucharest, Cluj-Napoca, research projects on creativity in the Institute of Psychology and Educational Sciences and in its centres around the country. Several organisations support the work on giftedness: RO-Talent, Henry Coanda Foundation, etc.

## Slovakia

The act concerning gifted education in Slovakia was inherited from an act in the former Czechoslovakia. Beyond general regulations, sublaws, executive regulations are, however, missing. Established talent nurture is carried out mainly in elementary and secondary school levels. A historical precedent was the institution of so-called 'people's art schools' whose establishment dates back to the years after World War 2. In the 1960's a system of special classes with extended train-

ing in some subjects was built up, and this system has been fostered after 1989 as well, taking turn in private schools as well.

The development of musical, dance, graphic and literary-drama talent is catered for in basic art schools, the system of which covers all the country. About ten percent of children attend these schools. In these fields there are several conservatories and secondary art-industrial schools at the secondary school level. Children talented in sports attend special sports schools (Dockal, 1996; Kovac, 1996). Children especially able in mathematics can attend special maths classes from the fifth grade or in independent mathematics secondary schools (Laznibatova, 1992). There used to be special classes of foreign languages from the fourth grade, but by now every school teaches foreign languages, and able children can start learning languages as early as the first grade (Farkasova, 1992). Since 1989 a system of 8-year grammar schools has been established (succeeding the fourth grade of elementary school) for highly able children, where teachers aim at a professional education of the gifted based on expertise in every subject (Dockal, Laznibatova, Kovac, 1992; Dockal, Kovac, 1993; Kovac, Matejik, 1992; Ostatnikova, Dohnanyiova, 1996).

There are no special programs for gifted children in regular schools, however, they have the possibility of pre-school training and grade leap and children can attend a subject of a higher grade if he is exceptional in it. Several competitions are organised for able pupils on regional, national and international level in arts and sports. Teachers can attend further trainings about gifted education but there is no special teacher training for this purpose.

In addition to schools, different vocational associations care for able children. One of the most active organisations is the Slovak Unity of Mathematicians and Physicists in holding competitions and summer camps. Summer camps are also organised by other arts associations (fine arts, music). Since 1991, they have a Czecho-Slovakian Association for Gifted Children with its members dealing with research and education of able children and also their parents or others interested. The Association organises professional conferences, seminars for parents and teachers, or summer camps focusing on a multilateral development of the creative personality of able children and their parents.

## Slovenia

The situation of gifted children attracts much less professional and common social attention than that of children with learning disabilities. State institutions are less active in this field, and so financial means are lower as well. However, there is a rise of civilian initiatives from below: private resources, private institutions for scholarships, talent education and elite schools. This has two centuries of tradition: in high quality education talent nurture has always been given special attention. Systematic efforts are being carried out for the establishment of a Ministry of School and Sports, which will then coordinate gifted education in Slovenia. This raises hopes about a better actual realisation of what is already stimulated in the constitution, in the Act of Education and in various regulations.

In implementation programs the emphasis is placed on the recognition that it is advisable to work out differentiated curricula, training programs in the individual fields of talent, in sports, music, arts or drama. The need for a professional background is growing as well (Ferbezer, 192; Makarovic, 1992, Ferbezer, 1996; Makarovic, 1996; David, 1997). Important positive changes can be observed as reflecting pluralism: possibility of choice at each level and in each direction, more emphasised autonomy of the individual, international comparison, competitions, education abroad, widening of scholarship funds for gifted children, larger autonomy of schools in their co-operation with government institutions. Teacher training focuses more on gifted education, however, this remains mostly on a theoretical level, practical methods, and techniques are less frequently applied.

The insufficient recognition of the gifted so far can be explained on the following terms: ideological prejudices, financial limitations, lack of theoretical background, insufficient teacher training, lack of scholarships, insufficient recognition of initiatives, lack of a national organisation of able children. In the past ten years there have been several conferences help on high ability:

- Extra curricular activities in primary schools, Maribor, 1988
- Gifted children in educational process, Maribor, 1987
- Gifted children: situation, problems, development possibilities, Novo Mesto, 1994.

A need for developing gifted education in Slovenia according to the ECHA principles has been stated several times, however, this should also adjust to national, cultural traditions. This would facilitate the process of changing ethnical identity into national identity, which could then become a basis for intercultural comparisons and possibilities of the spread of Slovene excellence in the world.

## **Ukraine**

The government's official actions demonstrate that gifted education is recognised in primary education (7-11 ys) and secondary education (11-17 ys). It is, however, insufficiently recognised in higher education. Concerning the historical background, we have to mention that talent nurture has been an issue already in the 1930's in Ukraine, but this failed to develop and get implemented in the USSR ideology of 'everyone is equal'. Academic research began in the 50's but governmental recognition of this field waited until the 80's. Reasons that facilitate the recognition of gifted education are as follows:

- desire to demonstrate that the Ukrainian people is good as the others,
- it is modern and fashionable to deal with the gifted,
- the recognition of young talents by the world's public increases the rating of Ukraine.

Priority is given to the following fields: sports, music, painting, dance, sciences, verbal skills (poets, writers). There is not enough attention paid to business and management areas yet, but it shows an up-coming tendency. Development focuses mainly on cognitive abilities (Kholodnaja, 1992; Shavinina, 1996a; Borodchuk,

1996; Partyko, 1996). At the same time a need for developing creativity has come to spotlight as well (Shavinina, 1996b).

Concerning actual programs, there are special schools and studios of music, painting and dance. Scientific talent is catered for in grammar schools. In a mixed learning environment able pupils are episodically given individual assignments, but this depends on the teacher's initiative and is not a common phenomenon. There is an experimental programme called 'Development of Creative Giftedness' and summer schools in the organisation of the Minor Academy of Sciences (Kokotko, 196). Another programme caters for gifted rural youth development. Competitions are held in each subject mentioned above, usually with a school-level, a regional level and a national level competition followed by an international Olympiad. In the background of all these we can find a focus in teacher training on how to prepare children for competitions in special classes.

Beside schools, there are several experts in Ukraine who hold free consultations for and morally support gifted children. This work is facilitated by the journal *Gifted Child* since 1988. Significant research work is carried out at the Department of Psychology in the Institute for Philosophy of the L'viv State University, under the supervision of Prof. Partyko. They scrutinise the advancement of intellectual and social talent in non-traditional educational programs as well as the impact of family education on high ability and also develop psycho-diagnostic methods of identification. All these affect positively a further improvement in the situation of gifted education in Ukraine.

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# **Developing Talented Children: Problems and Experiences**

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A project in the seventh and eighth grades aimed at providing the best possible school conditions to promote development of the abilities of children aged 13-14. The children's activity was founded on two main psychological and pedagogical principles: adequate motivation and individual differentiation. The children's development was monitored by means of intelligence and personality tests. The main results were as follows: There was a pronounced improvement in the performance tasks, but no significant development in verbal tasks; the role of inner motives had greatly increased, but the pupils had become more tense and impatient by the end of the school year. Necessary alterations in the project are outlined.

## **Introduction**

For a long time experts have disagreed on the most fruitful method of fostering the development of children. One camp says that this aim can be achieved most effectively at the school the child otherwise attends, that is, it is not necessary to segregate talented school children into separate schools. The other side holds the view that separate schools for nurturing talents should be set up and high ability students educated in these, in order to quicken their progress. For several reasons, we support the first view in principle, that is, we are convinced that the school the child goes to, the natural school environment, can provide the best possibilities for developing talents. At the same time it is true also that an intensive development of abilities depends on both personal and material circumstances, and if either of these is missing the child is not able to evolve to the utmost. Unfortunately, in Hungary too, conditions in schools leave something to be desired. What is more, even developing the basic skills presents problems. Among the reasons are lack of qualified teachers, lack of classrooms, the large number of children in one class, and the lack of educational materials and equipment—just to mention the most important reasons. In such conditions the abilities of a great number of children remain latent, that is, these valuable assets are lost.

Taking all this into consideration, it is necessary to collect the students who seem to be gifted and provide suitable conditions to promote their abilities to the highest possible level. This was the motive that led the headmaster of the Bethlen Gábor Elementary School, Törökszentmiklós, to recruit of seventh form students from 14 elementary schools from the town and its surrounding area, and launch an experimental program aimed at developing the children's abilities in the school

year 1987-1988. A class of 20 children (a number sufficient to comprise one class) was formed on the basis of nominations of the schools the students attended. Since the number of applicants was 20 altogether, no selection was possible. As there was one dropout, a total of 19 children remained in the project.

## The project

### Aims

As mentioned, the primary aim was an intensive development of the children's abilities by all available pedagogical means. Beside this general aim, it was our intention to prepare the seventh and eighth form students to achieve as well as possible in secondary school. In addition, the aim involved the task of developing the children's personalities (e.g., self-knowledge, adjustment, morality, behavior, etc.), in accord with the view that without a highly developed personality it is hard to further abilities.

### Organizational framework of the project

The students' morning and afternoon activities were organized into a unit. The main task was that the children should carry out the requirements of the curriculum at the highest level possible, but there was also opportunity for them to expand their abilities during extracurricular activities once special abilities became manifest in their achievement. The morning activities ran in accordance with the school curriculum; in the afternoon, however, work went on in special subject areas aimed at nurturing talent. There were eight of these that function as frames for developing abilities:

- mother tongue;
- mathematics;
- science;
- drawing, aesthetics;
- singing, music, aesthetics;
- Russian language;
- German language; and
- computer sciences.

In the morning the students worked together during lessons, in the afternoon they worked in separate groups. Each student was given tasks individually, an approach that had many advantages; it made it possible to go deeply into the subject matter of the class, practice it, gain more knowledge, and raise or maintain interest in the field in question. Table 1 shows the distribution of activities in a two-week period.

In addition to providing suitable conditions for skill development, these frames ensured that the students' relationships to others were stabilized. Obviously this was promoted also by spare time activities and by the fact that 11 students out of the 19 lived together in the student hostel.

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**TABLE 1**  
**Distribution of activities**

<b>Odd week</b>		<b>Lessons (Mornings)</b>		
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
Math	Biology	Biology	History	Math
German	Math	Physics	German	German
History	Spelling	Math	Geography	Geography
Russian	Technical ed.	Homeroom	Math	Chemistry
Spelling	Literature	Literature	Russian	—
—	Phys. ed.	Phys. ed.	Phys. ed.	—
Extracurricular Activities (Afternoons)				
Math	Computer science	Russian	Science	—
Mother tongue	Drawing, aesthetics	Singing, music	German	—
<b>Even week</b>		<b>Lessons (Mornings)</b>		
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
Geography	Physics	Biology	Math	Math
German	Math	German	Physics	German
History	Literature	Technical ed.	German	Spelling
Russian	Homeroom	Technical ed.	Russian	Chemistry
Spelling	German	Chemistry	Chemistry	Literature
—	Phys. ed.	Phys. ed.	Phys. ed.	—
Extracurricular Activities (Afternoons)				
Math	Computer science	Russian	Science	—
Mother tongue	—	Singing, music	German	—

### Pedagogical and psychological principles

During the project we had two main considerations in mind: how to motivate the children properly and how to achieve individual differentiation. It is well known that in evolving talents what kind of relationship the child has to the activity in question is crucial. If the activity is not in harmony with the aims of the individual, it is hard to believe that high skill levels well be formed. The basis for mobilizing inner energies is enthusiastic involvement with the material. We tried to create the appropriate motivation and identification with the learning activity, by means of the following principles.

- The children's self-activity played a central role in the project. Independent work had a strong motivating effect and was interwoven with rich emotions.
- The teachers were encouraged to motivate the children positively rather than use negative incentives.
- Feedback to the students after task solutions was stressed in motivation. Assessment of and information about the results inspired their achievement, too.

- Another important factor in motivation was the raising of the level of aspiration. This was brought about as a result of the arrangement of incentives, and largely depended on achievement in the given field.
- The teacher's personality in motivation was considered to be a decisive factor; consequently, permanent self-education and further education of teachers were important elements of the whole project.
- In order to ensure an appropriate background to the activity it was primarily important that the students should be able to form a positive self-image and develop self-esteem.
- In addition to the inspiration from solving tasks individually we also relied on motivation provided by group activities.

In addition to suitable motivation, the other main issue is differentiation in the children's activities. This is also an essential condition for evolving abilities, as children capable of different achievements are together in the same class. This was proved both by assessments in subjects and by scores on intelligence tests. Table 2, which follows, summarizes of the distribution of children according to their IQs, using scores on the Hungarian standardized version of the Wechsler intelligence test.

**TABLE 2**  
**Distribution of participants according to IQ**

Average	(91-109 IQ)	2
Above average	(110-120 IQ)	6
Very high	(121-130 IQ)	4
Extremely high	(+ 131 IQ)	7

There were possibilities for differentiated work during the lessons, but it was most clearly manifest in the afternoon periods. During the morning lessons differentiation was ensured mainly by allowing children to solve tasks at different levels, in the afternoon activities by giving them tasks most suitable to their individual abilities.

Three kinds of examination were conducted at the beginning and the end of the school year:

- The students did subject tests;
- They were tested on intelligence tests; and
- They filled out personality questionnaires.

The aim was to measure the influence of the pedagogical development work by means of objective psychological procedures. By taking into consideration the results, pedagogical work may be made more purposeful and there is greater opportunity to differentiate the amount of influence exerted on each student.

We are concerned here with the results of two of the areas in which data were collected: intelligence and personality test scores. The reason why we do not intend to analyse the results of the subject tests is that almost all the students (85-97%) did well in every subject at the end of the school year; apart from these general data only very special subject problems could crop up during an analysis

of students' shortcomings, and we are less concerned with these here. The scores on intelligence and personality tests show more of the general tendencies of the students' development. In the examination of intelligence we used the Hungarian standardization of the Wechsler intelligence test. In addition to measuring the general IQ it also examines the structure of intelligence, so that it can be used to measure the level of different abilities. There are two main types of task: five verbal and five performance tests. Table 3 indicates the types of task and shows differences between scores at the end of the year and those at the beginning.

**TABLE 3**  
**Scores on intelligence subtests**

Subtests	Mean difference	Standard deviation	Probability
<b>Verbal tasks</b>			
Information (memory, associative readiness, interest)	0.94	1.54	0.05
Comprehension (practical knowledge, generalization of experiences)	0.21	2.57	ns
Digit span (perception, memory)	-0.68	2.31	ns
Arithmetic (comprehending problems, picking out the essential points, arithmetic functions)	0.94	2.06	ns
Similarities (abstraction)	0.47	2.58	ns
<b>Performance tasks</b>			
Coding (perception, psychomotoric quickness)	1.21	1.75	0.01
Picture arrangement (visual perception, causal relations)	-0.47	3.00	ns
Picture completion (visual perception, part-whole relations)	2.10	2.80	0.01
Block design (analysis-synthesis, transfer, spatial orientation)	1.26	1.24	0.001
Object assembly	0.84	3.28	ns

What important consequences can be drawn from this Table?

1. At first glance it is striking that there was a pronounced improvement in the performance tests, whereas in the verbal tests there was hardly any change. The total data also give evidence of this, as the mean Performance IQ score increased from 123.8 to 129.7 ( $p < 0.05$ ).
2. The results show that the students' work based on their individual activity was fruitful. Similarly, the fact that the difference in achievement in the subtest information was significant indicates that the way knowledge was transmitted to the children had been successful.
3. The lack of improvement in Verbal IQ (120.9 vs. 120.3) indicates that more attention should be paid to language education.
4. Poorer results in the subtest Digit Span are an indicator of tiredness and loss of concentration at the end of the year. The large number of programs might be the cause here, so care should be taken in this area next year.

5. The significant changes in the performance subtests 6, 8, and 9 indicate a considerable improvement in analytic-synthetic activity, which is an important element of mental abilities.

In the personality examination the California Psychological Inventory was used. Its 480 items are arranged into 18 scales. The test is meant to analyse the basic dimensions of a normal personality. Significant differences between test scores at the beginning and the end of the year cast light on the development of the students' personalities.

1. There was a considerable decrease in the students' self-control; they became more tense and more impatient by the end of the year. This may be connected with the heavy workload mentioned earlier.
2. The value placed on creating a good impression also decreased. At the end of the year the children attached less importance to how others reacted to them. This is a sign of the development of autonomy.
3. The role of outside incentives in achievement decreased, whereas that of internal incentives increased. This indicates the success of the motivational work of the teachers.
4. Ability to win respect, general well-being, sense of responsibility, and flexibility all developed. The children became more mature in comparison to the beginning of the year. The responsibility they felt for their own future became more pronounced.
5. The value of the following scales decreased: sociability, disposition, tolerance, and feeling of unity. This might be an indicator of problems in relationships among children in the class.

We intend to investigate this by means of sociometric examinations, and to plan necessary steps on this basis. Probably increased rivalry means that the children do not pay enough attention to one another. Unfavorable boy-girl relationships also may be influenced by the characteristics of the age group, that is, adolescence. These results also point to the necessity of taking greater care in developing the students' personality, otherwise distortions may follow, that, in the long run, are likely to have unfavorable influences on the evolution of the children's talents. In addition to the teachers' observations, regular measurements can be of help here.

The personality tests also were filled out by the teachers at the beginning of the school year, as their personalities are essential factors in developing the students, and we had to know what values they possessed. Table 4 gives the mean scores on some important personality traits, putting the teachers' and the children's data side by side.

It is only natural that the superego functions should be more developed among teachers, although they approximate the average. Their strong self-control, conformism, and relative inflexibility are conspicuous. These last two features also support the view that teachers taking part in the project need permanent self-development and regular consultations. Further education was underway among teachers last year, too, and this year even further new aspects will be added to the agenda.

**TABLE 4**  
**Significant differences between teachers' and children's personality traits**

Trait	Teacher	Children
Self-control	63.19	51.09
Self-acceptance	48.40	42.13
Sense of responsibility	56.57	50.36
Tolerance	53.11	44.56
Achievement by conformity	57.86	51.47
Achievement by independence	55.49	46.70
Flexibility	41.90	50.60

### Perspectives, further tasks

This year another seventh form was started. We had a greater opportunity for selection, as we could choose the 20 students in the class from among than 40 applicants. While arranging the program for the new class we took into consideration the experiences of the previous year, and we are going to conduct tests at both the beginning and the end of the year. Considering experience to date we have modified the program for the first experimental class (the eighth for at present), making three essential alterations.

1. It is not compulsory for everyone to attend each subject area, but is optional according to interest and capacity. This option has already taken place: Three children have chosen four subject areas, six have chosen three, two areas have been chosen by nine students, and one area by one.
2. The teachers at the local secondary school also are taking part in the activities during the afternoon periods.
3. We are striving to ensure more opportunities for individual work, thus permitting further differentiation.

The children will complete the subject matter in three terms instead of four, thus permitting us to concentrate on more intensive development of their special abilities in the fourth semester. In order to carry this out we need further experience. We are going to continue observing how graduates from the experimental class achieve in secondary school and later, as success or failure will only manifest themselves in the children's achievements in later years.

[In: Cropley, A. J. & Dehn, D. (Eds.) (1990): *Fostering the Growth of High Ability: European Perspectives*. Ablex Publishing Corporation, Norwood, New Jersey. 65-74.]

# A Program for Developing Talents in Gábor Bethlen Calvinist Primary and Secondary Technical School and Students' Hostel in Törökszentmiklós

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Following our teaching staff's decision we worked out a complex program for developing talents for the school year of 1987/88.

We have been working on this special program for 12 years now. We reported the results of our work at each ECHA conference organised so far, where we were invited (Switzerland, 1988; Budapest, 1990; Germany, 1992; The Netherlands, 1994; Austria, 1996; England, 1998; Debrecen, 2000). Our results were very well received. We regularly publish our results achieved in this field in both national and international journals.

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There are also schools that are following our steps (in Mátészalka and in Szerencs).

From the 1987/88 school year we started an experimental class for children aged 13 and 14 (Classes 7 and 8). Later on, we worked out the program for children aged between 10 and 14 (from Class 5 to 8) so that we could recognize talents earlier and have more time to evolve them.

In the first year pupils came to the experimental class from 14 different schools. We had no prior screening, because just enough pupils (19) applied for admission, so everyone was enrolled in our school. In the background of this admittance there was the school achievement of the child and the opinion of the school's teaching staff. These two criteria, as you will see, were reliable enough to judge the children's talent by experience.

Before we give an account of the first two years of the experiment, however, I would like to say a few words about a theoretical question, which often leads to heated discussions among experts, even today. This puzzling question is how the intensive development of talented children can be realized. Some say that this development can be carried out only in the school the pupil attends under normal circumstances, so there is no need to gather the talented children into a different school. Followers of the other view, however, say that special schools and classes should be set up for children with outstanding abilities and that pupils should be selected to such schools and classes, where they can reap maximum benefits and develop faster.

We opted for the second alternative. Providing adequate circumstances we enhance the improvement of their skills better, we believe.

Our goal is to explore the skills of talented children and to improve them intensively – seeking the most effective pedagogical means. At the same time, another important objective is the development of different aspects of their personality (e.g. self-knowledge, adaptation, morality, manners etc.) in line with the view that without personality development talent development is hardly possible.

A great deal of the literature deals with the possible definitions of the concept of talent. We are convinced that outstanding talent manifests itself in both behaviour and achievement. We do not think that outstanding talent is equal with a high IQ and we believe that there are different talents. (Figure 1)

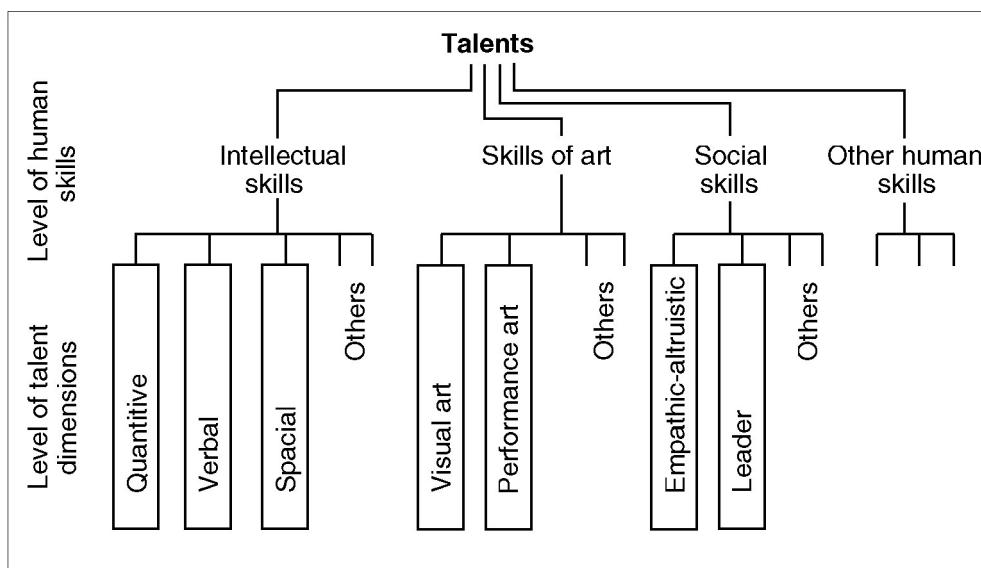
In 1987 Erika Landau said, also in Zurich, that talent is not like the weed at the bank of a ditch, which flourishes on its own, but it presumes determined and developing work.

In our education system we are fully committed to this idea. This is not in contradiction with general teaching, it is its condition, it stems from it.

However, to determine how we should take care of an exceptionally talented pupil is only possible when we have the suitable information.

Obtaining such reliable information cannot be based on subjective intuition, it needs continuous standardized measures, which indicate who fall behind and catch up with the others. We measure how the children can apply their knowledge and look at their spontaneous manifestations in certain situations. We also carry out experiments with scientific methods to see how the pupils are affected.

**FIGURE 1**  
The simplified sketch of Cohn's model (adapted from Cohn, 1981)



Outstanding achievement seems to be the recurring idea in the literature, although the development of exceptionally skilled children seems none the less important. This is not a new conception, for Martin Luther put it into words in as early as 1524 writing about the obligatory activity with talents at school.

### The structural framework of the program

The pupils' morning and afternoon activities form an organic unit. The primary objective is that they should meet the requirements of the syllabus at the highest possible level. In the light of their skills we organize special activities, so called blocks, to evolve their talent further. The morning activities are in the framework of lessons, but in the afternoon we continue our work in special blocks, where we establish the conditions to probing and research.

In the afternoon session the following blocks form the framework of nurturing talents:

- Native language
- Mathematics
- Science
- Computer science
- English
- German
- Latin
- Art and aesthetics
- Music and aesthetics
- Eurhythmics

In the morning the pupils work together in the lessons, but in the afternoon work goes on in split groups. Here, in the blocks, different exercises are given to different pupils, which serves several goals: it presents opportunities for deepening the lesson's topic, practising, obtaining additional knowledge, raising the interest in the given subject or the deepening of personal interests.

Anybody from our town and the neighbouring settlement can apply to these talent nurturing classes. For pupils from rural areas we provide accommodation at our students' hostel that can accommodate 80 people.

At the selection from the applicants we measure the following intellectual skills:

- The functional elements of attention (span, durability, distribution, transfer)
- The mechanisms of understanding thinking (concept-formation, exploration of relations, recognition and classification of phenomena)
- Memory (verbal, visual)

For the pupils in class 5 we applied the following tests:

- Intelligence
- Motivation for learning
- Learning techniques
- Anxiety
- Personality

On the basis of the above mentioned criteria, we compile a file on every pupil in Class 5, including the results of the assessment.

After 4 years we repeat this assessment. The results will follow.

Our several years' experience proves that in the development of talented pupils, personality factors play a dominant role.

The essence of our program is to perceive the practical tasks of talent nurturing in a complex way. We do not only pay attention to the skills but to the development of the pupil's personality as well.

Our program consists of two parts: the foundation one and the developing one. In the *Foundation section* (first part) our task is to recognize and to nurture talents between the ages of 10 and 11. In the *Developing section* (second part) our task is the special evolvement of the recognized talents based on individual programs with the help of mentors.

### **Foundation section**

The Foundation section lasts for one term after the children finish Class 4. During this period we accomplish the development of such basic skills that make the pupils suitable for meeting the requirements in Classes 5, 6, 7 and 8.

To recognize the talents we also provide possibilities that help us to explore the hidden talents of the pupils, so that they could be further nurtured in the developing section.

In the Foundation section the main objectives are to improve the basic skills to a high level, which can be characterised by clear, understandable speech, a good sense of performance, a sense of written and oral phrasing, a quick and under-

standing reading and a steady orthography. These objectives are set for *native language and communication*.

Complex mathematical operations, exercises with text, combinatory, complex mental operations and the development of precision are the objectives for *mathematics*.

Learning *foreign languages* (German and English) takes place in an intensive form in real-life, natural situations.

The education of *science* ensures the observation of natural phenomena and the recognition of causal relations.

The *learning techniques* applied, together with *self-knowledge* continuously developed help the child to study effectively and reach a clear understanding of the material. Mechanical study is eliminated. The development of self-knowledge in a direct way takes place in special activities.

Including regular *physical education*, some sport every day, we ensure a healthy balance for our pupils.

We take every effort to engage each pupil in the *arts* (music, dance, visual) so that we should have the possibility to spot special talents.

Every pupil takes part in classes of *computer science* and those developing *manual skills*.

We evaluate the performance of the pupils continuously in written form, but they receive no marks at the end of the term.

The teachers sum up their experiences in notes, and in this way, the fields where the pupil's talent is above average can be detected.

After the one term foundation section the intensive developing section follows lasting for three and a half-years.

### **Developing section**

In this section the further development of talents is realized by instruction tailored to the needs and interests of the individual. Table 1 shows the yearly division of the curricular requirements.

**TABLE 1**  
**Program arrangement**

5 <sup>th</sup> class:	from September to 1 <sup>st</sup> of March
6 <sup>th</sup> class:	from 1 <sup>st</sup> of March to 30 <sup>th</sup> of November
7 <sup>th</sup> class:	from 1 <sup>st</sup> of December to 15 <sup>th</sup> of June
8 <sup>th</sup> class:	from 1 <sup>st</sup> of September to 15 <sup>th</sup> of May (With a one- month foreign language course in winter) (Before 15 <sup>th</sup> of May a language exam, preferably at intermediate level) (From 15 <sup>th</sup> of May to 15 <sup>th</sup> of June final examinations)

It is worth mentioning that the work at our students' hostel supports the work at our school.

The program in talent nurturing provides acceleration and enrichment at the same time.

To achieve our ambitions it is essential that all the pupils obtain adequate learning techniques, which insures the independent acquisition of knowledge. The organised activities, both lessons and blocks, serve the development of intellectual talents together with the development of other special talents.

The results of intelligence, learning motivation and strategies, anxiety and personality tests seem equally intriguing.

Scientific measures are extremely important in this program. They are continuously carried out by the Department of Educational Psychology of the University of Debrecen, and every teacher, as well as the child's parents, are kept informed about the results.

The results of measures from Classes 5 and 8 from the past four years are the following.

## **Results**

### **1. Intelligence**

**TABLE 2**  
**Results of intelligence tests**

Categories	1996	2000
Intellectually outstanding	7	9
Considerably above average	5	1
Above average	12	7
Average intellect	4	3
Below average intellect	—	—
Intellectually weak	—	—

#### *Conclusion*

In the top category there were several pupils from the beginning, nevertheless, their number increased further, which is really valuable. There is still reserve in the pupils for moving toward upper categories during their secondary school studies.

### **2. Learning motivation**

Let us disregard the theoretical background of motivation, and present only the results of the two measures. (Table 3 and Table 4)

**TABLE 3**  
**Results of learning motivation tests**

Dimensions	1996	2000	Standard
Following	80.08	74.80	50.50
Showing interest	76.84	69.90	49.20
Performing	82.48	76.30	53.20

**TABLE 4****The ranking of the components** (The ranks of the first measure are in brackets.)

1. Acceptance of parents:	26.57	(1.)
2. Conscience:	25.57	(2.)
3. Responsibility:	25.42	(4.)
4. Need for order:	25.30	(5.)
5. Belonging to the peers:	24.69	(6.)
6. Need for knowledge:	24.03	(3.)
7. Acceptance on the teachers' side:	23.61	(8.)
8. Following one's own path:	22.96	(9.)
9. Interest:	22.96	(7.)
10. Pressure on the teachers' side:	11.70	(10.)

*Conclusions:*

1. Among the main motivation groups the following and the performing ones dominate, which is in good agreement with the characteristics of the given age group.
2. From the change in the ranking of the components it seems that no real rearrangements took place. Following one's own path became stronger, which is favourable for successful independent work.

**3. Learning techniques**

We draw conclusions from the results of Classes 5 and 8 (Table 5).

**TABLE 5****Results of learning techniques tests**

Strategies:	1996	2000	Standard
Profound	74.75	69.57	51.98
Organized	72.80	61.73	42.78
Reproductive	60.05	51.46	45.88

From the change of certain rankings we can draw some conclusions, so we should have a closer look at them. (Table 6)

**TABLE 6****The ranking of the components** (The ranks of the first measure are in brackets.)

1. Perception of great connections:	24.11	(5.)
2. Good work organisation:	23.57	(2.)
3. Striving for comprehension:	23.30	(4.)
4. Striving for perfection:	22.61	(1.)
5. Enthusiasm for learning:	22.15	(3.)
6. Concentration on facts and details:	19.73	(6.)
7. Mechanical learning:	16.00	(7.)
8. Avoiding failure:	15.73	(10.)
9. Learning for good marks:	15.65	(9.)
10. Success orientation:	15.53	(8.)

*Conclusions:*

1. The proportion among the main strategies remained almost the same. The tendency for reproduction decreased considerably.
2. From the ranking of the components the following should be highlighted.
  - The perception of great connections and striving for comprehension became stronger.
  - It is unfavourable that the factor avoiding failure precedes success orientation.

**4. Anxiety****TABLE 7**  
**Results of the anxiety tests**

	1996	Girls 2000	Standard	1996	Boys 2000	Standard
Total value:	40.04	37.72	41.38	36.70	35.93	39.21
Worry:	11.80	11.36	13.86	11.50	12.20	14.21
Emotional excitement:	19.30	17.18	18.31	17.50	15.86	17.03

*Conclusions:*

1. For the girls, the overall scores are favourable: every value is under the average, which means an optimal condition for the development of skills.
2. The same is true for the boys.

**5. Personality****TABLE 8**  
**Results of the personality tests**

	1996	Girls 2000	Standard	1996	Boys 2000	Standard
Extraversion:	15,60	15,72	14,90	16,20	17,73	16,39
Neuroticism:	6,00	6,66	9,06	5,50	6,66	8,88
Psychoticism:	1,90	2,27	1,52	2,60	3,06	2,64
Social comfort:	18,90	11,54	14,60	16,40	8,46	12,27

*Conclusions:*

1. For the girls, it is unfavourable that extraversion didn't get stronger. The other values remained almost the same. The weakening of the value of social comfort is characteristic of the age group.
2. For the boys, the value of extraversion increased, which is very favourable. The other changes here are not significant, either.

## Further studies

We also made a survey of the further studies and the performance of our pupils having left our school in 1989 and 1990. (Table 9 and Table 10)

**TABLE 9**  
**Secondary schools chosen after leaving primary school**

Type of school	1989 (N= 18)	1990 (N= 20)
Secondary Grammar School with General Syllabus:	5	5
Secondary Grammar School with Specialized Syllabus:	3	7
Secondary Technical School of Technology:	3	5
Secondary Technical School of Economics:	3	2
Secondary Technical School of Medicine:	1	1
Secondary Technical School of Food Industries:	1	-
Secondary Technical School of Arts	1	-
Secondary Technical School of Agriculture	1	-

All the students finished their studies in the above mentioned secondary schools. The index numbers prove that in our developing program we managed to stabilize their skills and personality factors playing a role in the process of learning. It is noteworthy, that a variety of secondary schools, colleges and universities are represented in our pupils' choices. We presume that our program may have contributed to this fact, for it provided the children with possibilities for gaining experience in many fields, for obtaining knowledge and for testing their skills.

**TABLE 10**  
**Chosen universities and colleges**

Type of school	1989 (N= 18)	1990 (N= 20)
University of Arts and Sciences:	2	4
University of Technology:	2	2
University of Economics:	1	-
Academy of Music:	1	-
University of Horticulture:	1	-
Teachers' Training College:	3	8
Primary School Teachers' Training College:	3	-
Academy of Commerce:	2	2
Agricultural College:	-	3
Police Academy:	2	-
Didn't educate further:	1	1

## Competitions

We mentioned earlier that outstanding talent should appear in the achievement of the pupils in every possible way. Our pupils from the talent nurturing classes prove their outstanding talents in different competitions, too. Their performance

in the competitions also reflects the differences between them. We followed the places our pupils, attending the talent nurturing classes, took in regional and national competitions in the last two years. (Table 11)

**TABLE 11**

**The number of the pupils who came fifth or higher in a regional or national subject competition**

	Regional subject competition		National subject competition	
	1998/99	1999/2000	1998/99	1999/2000
1 <sup>st</sup> prize	2	2	5	11
2 <sup>nd</sup> – 5 <sup>th</sup> prize	5	6	5	22

The pupils' everyday performance, their further studies and their results in competitions seem to suggest that we are on the right track.

We feel proud of the results achieved and believe that without the contribution of our teachers attending the postgraduate training course for talent developing experts and that of the other members of the staff, who regularly update their knowledge in every possible way, our pupils would not have made such progress.

Furthermore, the importance of the continuous co-operation between pupils, teachers and parents should also be emphasised.

Last, but not least, the feedback of the scientific measures regularly conducted provided invaluable support and guidance for us, observing which, we were hopefully able to improve and develop the project.

[Paper presented at the 7<sup>th</sup> Conference of ECHA, Debrecen, 19-22 August 2000]

# **Enrichment Programmes in János Bolyai Elementary School**

**FERENC GYŐRIK**

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*János Bolyai Elementary School, Szerencs, Hungary*

**MAGDOLNA GÖNDÖR BODNÁR**

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*János Bolyai Elementary School, Szerencs, Hungary*

Dear Ladies and Gentlemen,  
Dear Colleagues,

Complex personality development and talent nurturing in János Bolyai Elementary School of Szerencs dates back to ten years. We have taken over and adapted to local conditions the programme employed in Gábor Bethlen Calvinist Elementary School of Törökszentmiklós.

First of all, we should probably describe where Szerencs is located. The town of Szerencs, the gateway to Tokaj Hegyalja, with a population of 11 thousand, is located in Borsod-Abaúj-Zemplén County. In fact, it is a town of first rank in the mountainous area made world famous by its Tokaj wine.

The aim of our talent-nurturing programme is to explore and effectively develop the individual characteristics and talents of school children of 10-14. Besides developing intellectual properties, our programme includes personality development as well. This is in agreement with the view that evolvement of talents, endowments, general and specific capabilities is not possible without a developed and healthy personality.

We perform talent nurturing in separate classrooms and the selection of pupils participating is based on the application of pedagogical and psychological tests. In these talent nurturing classes the teaching-cultivating activities are performed according to the requirements laid down by the National Educational Syllabus, (NAT in Hungarian). Since pupils of above average capabilities comprise these classes, larger volumes can be taught, the material can be practised/rehearsed better and memorised at a faster rate, moreover, differentiated activities can also be included.

Actual differentiation and lessons ‘tailored to individual needs’ can be given in the so called afternoon sessions (blocks), where enrichment programmes can be realised.

The aims of the enrichment programmes could be summarised (after Sató and Johnson) as follows:

1. Great degree of complexity, which involves hypothesis formation, drawing conclusions, evaluation, etc.
2. Emphasis on interrelations and on the possible relations between various subjects, so that they could be utilised.
3. Introducing abstract ideas, theories and concepts to the children, which is favourable to their development in the field of sciences and which lays the foundations for a critical manner of thinking.
4. Introducing/including new sources, which are hardly, or not at all dealt with in the morning classes.
5. Choice, which means that the pupil can choose the particular subject he/she intends to study.

Our pupils can chose one or more of the following subjects:

- Communication in mother tongue,
- Conversation in foreign languages ( English and German),
- Mathematics,
- Computer sciences,
- An integrated natural sciences block,
- Protection of nature, environment and health,
- Visual arts and education,
- Sports,
- Special environment protection camping programmes

May I introduce some of the above mentioned subjects in more detail?

The integrated natural-science block was worked out jointly by the schools at Törökszentmiklós and Mátészalka under the supervision of Professor Mária Polonkai. Four disciplines, biology, geography, physics and chemistry are integrated in this subject.

The guiding principle in compiling the curriculum was the following:

- to provide more comprehensive and integrated knowledge,
- to develop intellectual capabilities,
- to present inter-relations between animate and inanimate parts of nature, natural phenomena and the interdependence within the environment,
- to focus on the points of convergence in the knowledge obtained through processing information within each individual subject,
- to cultivate responsibility towards fellow pupils and towards the environment,
- to assist in the development of personality,
- to provide opportunities for performing tests, experiments in special fields of interest and for making observations as well as for establishing hypotheses,
- to provide opportunities for developing communicational skills,
- to motivate pupils in obtaining skills and knowledge by themselves,
- to develop their creativity,
- to contribute to their social sensitivity and to change their attitudes in a positive way.

Taking the aspects outlined above into consideration, we compiled a curriculum and defined specific targets in the form of a matrix. They aim at the development of individual capabilities. Some of the targets identified are the following:

- kindling interest,
- improving internal motivation,
- changing attitude,
- improving behaviour and manners,
- promoting motivation and sensitivity,
- development of creativity.

Didactic duties were also worked out in detail. The curriculum includes the methodologies of evaluation, the schedule and the list of textbooks, teaching aids and video films to be used.

Let me briefly describe the experience we have gained so far.

Actual work started with the observation of the total eclipse of the Sun last August. The photographs and scientific explanations relevant to this phenomenon were evaluated together. Thus, the main subject for the first term was astronomy. The 'press monitor' was in operation throughout the year and the latest news on natural sciences was processed weekly. The Internet proved to be a useful source for obtaining news in the field of science. Information gathered from the Internet was also discussed and the pupils were asked to help each other to understand difficult issues and to solve problems which might have arisen.

Unfortunately, there were a number of natural disasters last year, such as earthquakes, floods, the cyanide contamination of the river Tisza and its consequences. The discovery of new constellations meant some more news and some more topics for discussion in the field of nature. All of the above were extensively covered in extremely heated 'discussion forums', generally taking place after the presentation of a talk on the particular phenomenon.

A group of three pupils from Class 8 participated in a competition on 'energy saving measures', which will play an even more important role in the future.

Dear Ladies and Gentlemen,  
Dear Colleagues,

Over the last two years we have broadened the system of afternoon blocks and invited other schools from our town to join in our programme. Briefing the headmasters of some schools in the neighbourhood we offered them our assistance and co-operation. We are pleased to receive talented pupils from small schools at our afternoon sessions, so they also have a chance for faster development and more efficient learning. In addition to welcoming talented pupils we also count on well-prepared and 'energetic' teachers willing to work with us and participate in our programme.

This approach has enabled us to expand afternoon activities and the nurturing of talents within the framework of 'expert circles' now working in the following five fields:

### **Foreign languages**

The total number of pupils from János Bolyai Elementary School and from other schools in the area participating in our “expert circles” in the English and German languages was  $15+15=30$ . The two 45-minute classes held weekly covered the topics required at the national language exams at elementary level, with special emphasis on effective communication and grammatical systematisation.

More than 50 percent of the classes were held in the computer room of the school, where pupils got acquainted with and successfully used various, purpose oriented CD-ROM-s for language teaching. In addition to these, a good use was made of the Internet in processing authentic texts and in finding information about the geography, the sights and the culture of the countries where the languages are spoken. The language courses were followed by a “mock-examination” passed satisfactorily by each participant.

### **Informatics**

From five district schools and from Bolyai Elementary School more than 20 pupils participated in this programme. Three teachers set up groups comprising pupils from Classes 6, 7 and 8 according to the capabilities and the particular interests of the children. The programmes for the groups had been worked out in advance. Although the pupils were attracted primarily by the accessibility of the Internet, the participants examined texts, handled databases and compiled simple programmes themselves. One of our children came 13<sup>th</sup> at the National Computerisation LOGO competition.

### **Mathematics**

The “expert circles” are in operation in all four senior classes (5-8) with the attendance of 2-3 pupils from other nearby schools. In all of the senior classes we aimed at improving the problem solving capabilities of the children through encouraging the application of different approaches in solving mathematical problems. The children were motivated to rely on a heuristic and intuitive way of thinking. By creating groups of 3-5 pupils we gained some really promising experience in employing a co-operative method of learning. In addition to the aspects described above, the principle aim of the mathematics blocks was to prepare the children for participation in different mathematical competitions (for example competitions named after Tamás Varga, Ilona Zrínyi, László Kalmár and the Hegyalja mathematical competition).

### **Visual arts and motion-culture circle**

7-15 pupils participated in these circles, which were set up so that children could develop their skills in subjects not comprising a part of the National Curriculum. The following types of activities were organised: applied graphics, decoration, photography, proof-reading, textile-design, movie-culture etc. This, latter programme attracted a lot of attention and those interested seem to have acquired a fairly

deep understanding of the cinematic art. Some of the children's works were exhibited and submitted to competition.

#### **Chemistry and environment protection circle**

The environment protection movement dates back to eight years in our school. We, as a matter of fact, joined the project announced by the Norwegian Nature Protection Association and later on, the SEMI programme as well. Since then we have continuously been measuring the quantity and acidity of precipitation (rain-fall, snow-fall, etc.). With the help of a lichen-scale, data on the sulphur contamination ( $\text{SO}_2$ ,  $\text{SO}_3$ ) of the air are collected and conclusions are drawn from the results. These measurements and measured values are far more motivating than the theoretical studies in chemistry classes.

Through these experiences the pupils can easily understand the importance of conservation and that humankind should pay more attention to natural catastrophes, acidic rain, the thinning of the ozone-shield, the E-Nino phenomenon etc., or else we may destroy the living world and bring about the demise of mankind. Taking part in the work of a conservation camp, in the wonderful and as yet pollution-free Zempléni Hills, in Sima, is an integral part of the personality enrichment programmes outlined above. During a weeklong stay our children come face-to-face with the mysterious beauty of nature and obtain answers to a number of questions unanswered so far.

With the aid of experts in geology, ornithology, environment-protection, fish-biology, astronomy etc. the participants get acquainted with various plants, the wonderful birds, minerals and, by using microscopes, they can observe the living organisms of various rivers and lakes. We seek answers to such questions as how the Earth, the infinite number of planets and heavenly bodies of the Universe have been created through billions of years.

All these give rise to further questions in the fantasy of children, so they will naturally try to find answers to them.

Dear Ladies and Gentlemen,  
Dear Colleagues,

Over the past 10 years altogether 139 pupils have finished their studies in talent nurturing classes of our school. 80 percent of the pupils entered secondary school (grammar) and 20 percent continued their studies in secondary technical schools.

Currently, 107 pupils are enlisted in such talent-nurturing classes from Classes 5-8.

Thanks to the enrichment programmes – and occasionally, to some individual programmes – the creative thinking of the children shows a spectacular development, their problem solving capabilities have improved, their critical way of thinking has strengthened and they have taken a substantial step towards meeting the requirements of their studies.

The results – some of which I would like to share with you – are the following.

89 of the children leaving our talent nurturing classes passed the national language exam at elementary level (oral, written or both), which is about 64 percent of the total number of pupils. Four of these children satisfied the requirements at intermediate level by the time they left Class 8. With the assistance of the Hungarian Association for the Gifted and Talented, 5 of our pupils attended international language camping programmes in Austria, Germany and England. Let me take this opportunity and express my thanks to the Association, the receiving countries and especially to Professor Karl Kruger.

Fifteen of our pupils qualified to participate in the finals of various competitions (chemistry, mathematics, physics, computer sciences, languages, etc.)

As far as games and sports are concerned, two of the school teams made their way to the national finals and twelve pupils were successful in the finals of sport competitions. Due to the shortage of time I cannot mention runners-up of county competitions.

We should be thankful for all these results and achievements to Professor László Balogh and the other professors, who have been of great help in our work with their advice and with all the necessary evaluation they carried out ever since the project started.

Let me thank them once again and say that we are looking forward to their continuing support. Thank you for listening to my presentation and let me wish you all the best for the rest of the Conference.

[Paper presented at the 7<sup>th</sup> Conference of ECHA, Debrecen, 19-22 August 2000]

# The Improved Version of a Complex Talent Development Programme

ÉVA SZOMBATHY

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*Zsigmond Móricz Primary School, Mátészalka, Hungary*

ERZSÉBET SZŰCS

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*Zsigmond Móricz Primary School, Mátészalka, Hungary*

Our school, Zsigmond Móricz Primary School, was opened in 1987. In 1996 it was combined with Lajos Kossuth Primary School, where we have special computer technology classes. Altogether, we have 29 classes with 736 children.

From the very beginning we have been interested in the development of children with outstanding abilities. This is why we joined the programme of the Department of Educational Psychology of Lajos Kossuth University in 1991, and with the help of this department we started our own talent development programme for children aged 11-14. We adapted and improved the special programme of Gábor Bethlen Calvinist Primary and Secondary Technical School and Students' Hostel in Törökszentmiklós and János Bolyai Primary School in Szerencs. The characteristics of the area, where our school is located and the social background of the children determine our programme.

In our work, we strive to challenge pupils to develop their potential, to develop a positive attitude towards life, to take an active part in whatever they get involved in and never to give up. We increasingly ask children to take responsibility for their own lives and learning so that they are able to face the challenges of the 21<sup>st</sup> century. Consequently, there are two main priorities in our work. One is to support and develop children who are slower on the uptake, while the other one is to develop talents.

The main idea of our programme agrees with Imre Sándor's idea, according to which talented children need a development, which gives them the opportunity to do their best, achieve success and reach their full potential. We would like to help children to become positive, self-motivated, confident and caring individuals. We think they need to recognise their talent and make their dreams come true. Our world needs people with ideas, active people who can face challenges and solve problems. How can we realise these ideas?

The main aims of our programme targeting at the above task are:

- The identification of the individual capacity of the children
- The development of their intellectual aptitude
- The development of their personality, without which it is impossible to improve their abilities

In order to gain better understanding of the students' personality we:

- measure the methods and strategies used in the process of learning
- analyse learning motivation
- examine the learners' anxiety

The results of these measurements are compared to pedagogical experience and they are carefully considered when planning and organizing an efficient development of the children's abilities.

We would like to achieve our pedagogical aims in two main respects: (1) an internal and external motivation of the learner – develop true self-value, and (2) individual differentiation.

The students are selected at the end of the fourth year. At the selection the following abilities are tested: the elements of attention, verbal and visual memory, thinking and intelligence. Usually 22-24 students are selected to the talent developmental class.

### **The structure of our programme**

The children have morning and afternoon activities, which are closely connected with each other. The morning activities run in accordance with the school curriculum but in the afternoon they are targeted at special areas. The primary task is that the children should meet the requirements of the curriculum at the highest possible level but they should also have the opportunity to develop their abilities during extracurricular activities when we provide them continuity and progression through well organised and resourced learning experiences. During the extracurricular activities children are involved in the learning process as much as possible so that each of them could secure maximum benefits from education.

In Classes 5 and 6 the regular afternoon activities are compulsory for each student. They work in groups where they have the opportunity to extend their knowledge, to aim at a full understanding of the material covered and to recognise their special interests.

From Class 7 the afternoon activities are optional, not compulsory, students choose 2-4 activities depending on their interest. We provide the following activities: (1) humanities, (2) foreign languages, (3) computer studies and information technology, (4) art, (5) sport and dance.

In the second semester of Class 8, 40-50% of the afternoon involves free activities. The children spend their time in the library with revising the material and systematising their knowledge, they prepare for language exams and for a complex examination at the end of their studies at primary school. In Class 7, the students take part in a 30-hour training course in learning methodology, while in Class 8 they attend another one in self-knowledge development. The head and colleagues of the Department of Educational Psychology of the University of Debrecen lead the training courses.

### **The aims of the afternoon extracurricular activities**

#### **Humanities**

The main components of this activity are Hungarian and world literature and history. Students deal with literary and artistic works looking at their historical background as well. Besides providing factual knowledge, our teachers help the

students to be able to acquire knowledge on their own and to develop their communicative abilities. They regularly go to the theatre and concerts together.

#### **Mathematics and science**

The main aim is to develop deep understanding, problem solving, a critical sense and enhance the formation of a modern scientific approach on the basis of mathematics. The students gradually develop greater knowledge and a better understanding of scientific ideas and of the world around them.

#### **Foreign languages**

Learning foreign languages happens in natural situations. The aim is to make the children realise the importance and the joy of learning languages, giving them ample opportunity to communicate. We want them to develop their full potential, become confident, competent and accomplished users of the languages.

#### **Art, sport and dance**

Our programme is different from those of the above mentioned schools also involved in this field. Although the importance of intellectual, academic abilities is not questioned, art and dance are given more credit in our school. We believe that learning should be fun and art, dance and sport are the areas where fun is an integral part of our intensive programme. Children receive a balanced and continuous programme in Art and Craft working with a wide range of materials. They are exposed to different techniques and encouraged to try different approaches to a wide variety of situations and stimuli.

We maintain close contact between our school and the local Music and Art school. In this way, we provide opportunity for the development of specific talent domains. At the end of the school year our students are encouraged to experiment with wood-carving, weaving and pottery in the Art School. Later on, our talented students can carry on their artwork at a higher level at this school and they can perfect their skills. During the Art lessons our pupils can select from: fine art, folk art and floral decoration.

##### *Fine art*

Our artist colleague deals with talented children in groups of 6-8. Basically, the children are motivated to express their ideas and feelings through painting and drawing. Although they work in groups, we strive to meet the individual needs of each child. They are encouraged to choose the technique most appealing to them.

##### *Design and making floral decoration*

This is a special extracurricular activity. Students gather crops, plants, and flowers, dry them, learn how to use different tools. It is a particularly enjoyable area because children develop their creativity in making products to their own design. In the meantime their manual skills and aesthetic sense also develop. Various seasonal decorations are made for special occasions such as Christmas, Easter or they are simply used in the children's homes.

*Folk art*

It has a great importance not only in preserving our folk traditions but in giving our students the benefit of spending their spare time in a useful way. Children develop their practical skills while working with a variety of materials including wood, textiles, and cornhusk.

Accuracy and persistence are needed to these activities; they develop manual skills, creativity, and the sense of form and colour. They develop personality and help children become thoroughly independent and ready to co-operate.

Art classes are on Friday afternoons so after the tiring mental work during the week they provide relaxation as well.

*Sport and dance*

Our school seeks to harmonise mental and physical activities. A healthy way of life can only be achieved by regular exercise.

Our sport, games and dance programme provides fun and enjoyment so that children develop a range of physical skills. It has become evident that children who do not always show outstanding abilities at learning can be talented in other ways, they can be good at sports and dance. Games and sports teach children how to cope with the responsibility of being a team member, how to abide by the rules and how to cope with success and failure.

Dance is one of the most important activities in our programme: it is compulsory for all students. It provides a complex way of developing children. We offer classical, modern and folk dance but prioritise folk dance.

We think that folk dance helps the children understand the importance of their culture, treasure their national identity. The students who take part in the work of folk dance groups are able to form relationships with each other; they also have the chance to express their own abilities freely. We have several groups for students of every age group at different levels.

**Measurement of efficiency**

The efficiency of the programme is regularly measured with the help of Dr. László Balogh, the head of the Department of Educational Psychology of the University of Debrecen. We monitor the following:

- general intellectual abilities
- learning strategies
- motivation
- anxiety
- complex personality

The teachers who work in this programme are expected to be ready to work with talented students. It requires more energy, heated commitment and a sense of vocation. The teachers working in this project attend in-service training courses in their schools as well as further training courses at the University of Debrecen.

# **Educating Gifted Children in Szerencs. Enrichment Project at István Bocskai Secondary Grammar School and School of Economic Studies**

ATTILA KISS

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*István Bocskai Secondary Grammar School and School of Economic Studies,  
Szerencs, Hungary*

## **Historical and theoretical background**

Any secondary school's main aim is to prepare its students for the entrance exams of universities. Considering this fact the teachers in our school decided to start an enrichment project in 1993. The staff of our school realised the importance of educating the gifted and the talented and the management tried to integrate this special task in our grammar school's training programme. As talent development is becoming more and more important in our school we are also able to provide an even more intensive and varied preparation for the entrance exams.

Taking everything into consideration, we can assume that it was also a necessity to launch this project as a great part of our students takes part in a similar project in the primary school. In our town János Bolyai Primary School has had a special scheme for talent spotting and development for many years in co-operation with the Department of Educational Psychology of Lajos Kossuth University of Debrecen. So the children attending this primary school and their parents expect us to deal with the gifted in a similar way.

The theory and practice of educating the gifted are varied. One of the reasons for it can be that the views of scientists representing different fields of science are varied, too. What we are sure about, however, is that the ideal age for spotting the gifted and talented pupils and developing their abilities is the period between the ages of 3-18, which is the time when the children go to nursery, primary and secondary schools.

Thus, it is the teachers' task to find effective and successful solutions to the problems of spotting and instructing the highly able children in the most varied ways in a state school as well. Considering the limitations of public education and the average size of classes, the best way to select and encourage the development of the gifted is to provide a wide range of extracurricular activities for them.

State education mainly aims at developing intellectual abilities. But the activities offered by school education are not varied enough for developing highly able children, especially because talent renders unusual and outstanding achievement. We should pay special attention to these children and stress the importance of spotting them and improving their achievement.

Bearing in mind the above mentioned facts we are hoping find answers to the following problems.

- How can we spot and select the able pupils?
- What range of activities should the school provide for talented pupils – as an offer – in compliance with the traditions of school education?
- What kind of pedagogical methods are the most appropriate to establish education that suits every able pupil best?
- What resources are needed to undertake these tasks?

Among other things we have tried to find effective and successful answers to these problems, which we think to be vital.

### **Spotting and selecting gifted and talented children**

Selecting the gifted is a multiphase process, as the knowledge on the basis of which we can do it is diverse in time and place.

When the children are accepted at our secondary school we can get a lot of information in connection with their previous achievement, due to the project in János Bolyai Primary School, as in that school teachers look for gifted pupils and develop them deliberately with the help of experts during the 4 years the children spend there.

Not only the knowledge gained at the primary school but also preparatory courses for the secondary school, different competitions, and the results of courses and those of the pupils' entrance exam let us have a preliminary basis for selection. It also means that the children who start their secondary education have already been selected in a way and the admitted children are supposed to continue their studies after taking their GCSE, and they plan to have a highly qualified job. So the education of the able children should and can be planned from the very beginning of their secondary school education. Its first evident method is differentiation and forming groups according to abilities.

Later on, spotting and selecting the able children is done continuously, as the form teachers and the subject teachers feel that it is their task, although parents are not excluded from the process either; on the contrary, they are encouraged to get involved, as they might know their children's special abilities best. On the other hand, introducing quality control in education means that the relationship between the parents and the school is becoming even more important than ever before.

### **Extracurricular activities offered by our school**

The principle of demand and supply known from economics has been employed in this project. Schoolchildren and their parents have a chance to ask the institution to provide certain possibilities for talent development. The school itself presents its offers on the "market" listing the activities on offer, from which the pupils can

choose. We have studied other schools' projects that deal with enrichment and we have tried to incorporate their experience into our practice. At this point we should mention our co-operation with János Bolyai Primary School, which has proved beneficial.

A considerable part of the activities requested by the pupils and offered by the school seems to be fairly stable over the years with some slight changes, thus we have taken every effort to integrate these activities into the curriculum at István Bocskai Secondary Grammar School and School of Economic Studies.

Some of them are integrated in the morning lessons as optional ones, from which certain forms can choose.

This part of the project includes the following:

Day "A"	Day "B"      in the 6 <sup>th</sup> and 7 <sup>th</sup> lessons
Mathematics (2 lessons)	History (2 lessons)
Hungarian literature (2 lessons)	Physics (2 lessons)
Biology (2 lessons)	Chemistry or Geography (2 lessons)
Computer science (2 lessons)	Computer science (2 lessons)

So if somebody chooses mathematics on day "A" she or he can not have another subject on the same day but on day "B" she or he can choose any of the five subjects. The children choose the subjects voluntarily but after deciding on any, they should continue attending the lessons for at least a year. The peer group's best, most able pupils attend these extra lessons – if they go to lessons on both days, it means that they have 4 extra lessons a week – where the subject teacher is able to teach the subject at a higher level and in more detail, what is more it is easier for the teacher to differentiate according to the children's abilities and their progress.

The subjects on offer have been carefully grouped, so that any pupil can opt for a combination of an art and a science subject at any given time. Thus, history can be paired with mathematics or Hungarian literature with physics, but the more conventional combination of physics and mathematics or literature and history are also possible. Quite understandably, some children only opt for one subject offered on the two days so that they can spend more time preparing for the lessons.

While we were planning the project, we started to wonder what we should do with those children who seem to have high abilities in a certain subject but refuse to take part in any activity aimed at developing their abilities. In such cases, the form teacher and/or the subject teacher – in co-operation with the parents – might try to persuade the child to join the extra class, but it should be done with great care. If it does not work we have to give the idea up temporarily because able children characteristically have strong inner motivation, so in such cases the pupil's personality is probably not mature enough to feel the importance of taking extra lessons.

Besides the optional lessons in the morning, there are some extra activities available for our talented pupils in the afternoon as well. Pupils, again, can choose

these activities voluntarily but they are open for any pupil of our school, too. On the basis of the principle of demand and supply above mentioned we provide the following range of activities, each of which means coming together for 2 or 3 hours once a week.

### **1. Language development**

Language learning and a good command of foreign languages have recently become more important than ever. Those who learn languages get acquainted with other cultures and learn how to accept and respect different values. In this way, the world opens up for them. Most course books give some information on a country's sights and its history, but it is impossible to gain a deep insight at the language lessons only. This is the reason why children do not have their own opinion on the topics and they can only use the memorized, practised sentences without being able to form and express an opinion of their own.

During the morning lessons there is never enough time to develop speaking skills, that is why we have decided to offer the following extracurricular activity in the afternoon. We have collected about 200 different topics from everyday life. For each occasion children can choose the two they are most interested in, which will then be discussed. The topics are only outlined with a mere statement. When they are discussed the pupils can choose from three different roles: they can join the group arguing for, or that arguing against the statement, or they can be the judges. After taking the different roles they can express their own opinion freely. (The leader of the game should be the teacher.) Taking part in a free conversation makes it easier for the children to speak in a foreign language and develop their language abilities to a great extent. We have two purposes: first of all, schoolchildren might discuss the topics they are interested in and which they do not even mention during the language lessons. Secondly, this special activity makes it possible for each of them to develop their abilities at their own pace, which is highly advisable, as their language skills can be totally different. During a discussion, however, everybody is welcome to contribute and because they express their own opinion, they will rely on their own vocabulary.

At the same time, the teacher may deal with the able children while developing language skills. These discussions in foreign languages offer an excellent opportunity to use the language itself while they also encourage the children to form and express their own opinion, which formerly only when the children had a lesson with their form teacher but those discussions naturally were in their native language.

### **2. Folk dance and folk art**

Folk art may play an important role in enrichment projects. The success of the folk dance group proves that the children who sometimes do not show outstanding abilities in learning can be very talented in other fields for example they can be very good at dancing. What is more, those children who are not really fond of physical education lessons often realise that this type of physical activity is suit-

able for them. On the other hand, we think that with the help of folk dance we can make the children understand the importance of their country's culture, their national identity can be developed so that they realise that they belong to this nation, and that they get interested in their own country's culture and past.

The pupils who regularly take part in the work of the folk dance group are able to form relationships with each other, yet they also have the chance to express their own abilities freely. Folk dance is the best way to form strong ties in the community. The children are instructed by a folk artist dancer. We do think that the most important thing is that the members of the folk dance group have formed a real community, which can be set as an example to other communities at our school.

### **3. Editing and writing a newspaper**

Teenagers are really interested in all the problems that everyday life invariably presents us with. The events happening in our environment, in our country or in the world, make our students think about some problems and look for possible answers.

It is well known that the mass media have an important role in forming ideas. This is also true for the articles, which appear in the school newspaper. The style and contents of these articles reflect the life of our school from the pupils' point of view. Moreover, they are an excellent means of self-actualisation.

Two of the journalists working for the local newspaper, who have degrees as teachers and journalists with long experience in journalism guide those who are interested in writing for newspapers.

### **4. Fine arts**

We can help children to have outstanding achievements in individual and free creation if we are not forced to block their self-expression in any way. Fine arts involve self-expression and creativity. Fine arts help the development of independent, free but disciplined personalities, children who are thoroughly independent but ready to co-operate.

We can expect the children to fulfil the requirements and to have a deep and thorough knowledge of the fine arts if we regularly discuss works of art with them and also let them create their own.

Children who show talent in this field are selected during the morning lessons on the basis of their work and progress. In the afternoons they are offered extra lessons every week where they can evolve their talent with the help of one of our teachers, who is not only a teacher but has been noted as an artist for many years.

Individual training ensures that the children are given tasks, which are suitable for their own talents and that they can perform to their best knowledge and talent.

The most talented are invited to take part in the work of the Fine Arts Summer Camp, where they can learn new techniques (e.g.: pottery, baking, taking

photographs, making enamelled jewellery or ornaments). Teaching art has several tasks, the most important of which is the development of visual imagery. Beyond that, through a better understanding of art, the children learn a lot about the world, too.

## **Summary**

We pay special attention to:

- spotting the gifted and talented children and to measuring their development regularly,
- finding the most varied teaching methods and activities to improve the achievement of the able pupils, and
- finding new methods that can be used in enrichment programmes.

## **Our plans for the future**

- On the model of our co-operation with János Bolyai Primary School we intend to invite some other schools in our town and the primary schools in the region to join in the project.
- We would like to involve the parents in the project to a greater extent, as we are sure that the teachers at our school together with the parents are able to work more effectively and they can reach better results in the children's development.
- We do hope that the local council will provide the resources for the extra curricular and non-compulsory lessons.
- We would like to work closely with the management of the student hostel so that the talented children's after school activities should be planned more carefully and effectively according to their own abilities and needs.

We are proud to mention that our work has really been successful so far: our representatives attended the conferences of ECHA in Nijmegen in 1994, in Oxford in 1998 and in Debrecen in 2000. We also take part in the regional and national conferences on talent development.

# **Guiding the Gifted at the Lajos Kossuth Training School of University of Debrecen**

ISTVÁN TITKÓ

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*Lajos Kossuth Training School of University of Debrecen, Hungary*

Our school, the legal successor of the well-known Protestant Boarding School for young ladies “Dóczy” was secularised in 1952 and has been maintained by Lajos Kossuth University (now University of Debrecen) since the school-year 1958/59. Because of the activities of the teaching staff “The Kossuth”, as it is generally known to the public is a popular institution both in and outside Debrecen.

Our school has a dual function: it is an institute of public education where 737 students are taught and educated. It is also the site of teaching practice for the trainees, which means that we are part of the teacher-training program of the university.

In the local pedagogical program of the school one can read the following about our philosophy:” The underlying principle of our school is to form sociable, competent, and motivated students who can make use of their talents to a full extent in their future careers. Our school actively takes part in the teacher training program of University of Debrecen, and tries to make trainees familiar with the teaching and educational aspects of the complex work that goes on in the school. Our motto is: *“One is taught by teachers and shaped by the environment.”* (László Németh)

For the general public our school is basically an institute of public education, and thus it is evaluated on the basis of how we fulfil instructional and educational duties. Each year the Ministry of Education publishes the official ranking of the 300 grammar schools. This document ranks the schools of the nation on the basis of the percentage of students accepted to higher education. Our school has always been among the top twenty, and often among the top ten schools in the nation.

*The position of students at school* is determined by the attention that they get to develop their individual capacities. Our school has no registration problems. The six-year-program has become especially popular. We have always had a great number of students from rural areas and from small towns. They make up 25-30% of the total number of students. The highly motivated, competitive youth of our school also account for the outstanding results: 90-95% of the students want to enter higher education, and taking into consideration their second options almost all of them are accepted.

A great number of our students take part in different competitions, the National Competitions being the most prestigious ones. During the past ten years,

62 students finished in the top 10. The number of those who pass the intermediate and advanced state language exams is continuously growing. At the moment the rate of students having passed proficiency exams in foreign languages is 70%.

The results of the maturity examinations are also reassuring. The average at the maturity examination is 4.4 – 4.5, which corresponds to the average students have at the end of the twelfth year. There might be some subjective elements in these exams, but as most of the tests are set at the national level, these data also show the efficiency of the school.

In our educational program we strive to convey general moral values and the basic values of human civilisation: humanity, patriotism, justice, love, and friendship. But we also take into consideration the subjective nature of values. We aim to help students develop the virtue of tolerance, to accept otherness in others, and to respect human dignity, other cultures, religions and thoughts.

The philosophy of our staff is to convey the most important aspects of a humanistic education so as to provide students with a basic knowledge which enables them to find their way in today's complex world and to be able to tell good from bad, valuable from worthless, true from false.

Our tasks and goals comply with the guidelines set forth in the National Curriculum and with the requirements of the maturity examination. The core of our pedagogical activity is a child-centered education based on individual differentiation. Great emphasis is put on the complex development of personality as well as on social skills to bring up educated, creative citizens. We want our students to realize that success can only be achieved by hard work. The sense of national identity, communication skills in the mother tongue, the protection of the human and biological environment, and a sense of beauty are issues of great importance in institutionalized education. Great attention is paid to physical education and sports in order to improve our students' health and to develop their character and mind. It has been part of the traditions of the school to give priority to academic education and to assist students in exploiting their talents.

Our pedagogical program is a comprehensive one: it includes learning, games, work, cultural activities which aim at improving students' self-knowledge and will power, developing their co-operative skills and helping them to create their own lifestyles, habits and value-systems.

## **Major academic specializations**

### **Teaching foreign languages**

Teaching foreign languages at a high level has a long tradition in the Training School of the University. Our school took a major role in the pioneer work of starting classes specialized in foreign languages. We used to have classes specializing in English, German, French and Russian. For a long time these classes supplied the region with foreign language teachers. However, the role of foreign languages has changed recently. Learning a foreign language is becoming a tool necessary for employment rather than an aim in itself.

Our students have the opportunity to learn two foreign languages. They can choose from English, French, German and Russian at both beginner and advanced levels, and they can study Latin at the beginner level. In the near future, we plan to introduce Italian as well. The first foreign language is the one students start to learn in primary school. Our aims are to provide our students with a knowledge in this language that approximates the level of the state exams, thus making it possible for those who work hard to pass it. The aim of teaching the second foreign language is to pass the maturity examination.

Foreign language teaching is facilitated by the use of multimedia, the language lab and audio-visual aids. During their 4 or 6 year academic education, students should acquire the following skills: basic communication, listening comprehension, reading comprehension and translation.

#### **Teaching in the arts option**

The aim of this option is to develop the skills and expertise of those students who are interested in Hungarian literature and grammar, history, foreign languages, philosophy, social sciences, arts and the history of arts, media studies, etc. Curricular requirements of these subjects are in accordance with the advanced level maturity examinations and the requirements set by colleges and universities at the entrance exams. Concerning sciences, the aim is to gain basic knowledge and skills to be able to pass the matriculation examination. In science subjects, there is less time for putting theoretical knowledge into practice. Special attention is paid to the history of the science, and Hungarian contributions. This kind of approach to mathematics, where the emphasis is on theoretical issues rather than on practical ones, helps to develop the basic logical skills, necessary even for those interested in the arts.

#### **Teaching in the science option**

The framework is similar to the arts option, however, in this case the main goal is to assist students in acquiring extra knowledge of chemistry, biology, geography, and computer science. Advanced level mathematics is an integral part of this curriculum. Students are provided with knowledge that matches the requirements set by colleges and universities in the entrance examinations. When teaching mathematics, we put stress on problem solving and familiarize students with different branches of the subject. Concerning arts in these classes, students are prepared for the maturity examination. We seek to arouse and maintain their interests in literature and other works of art as well as to give grounding in aesthetic values. When teaching history, we concentrate on the role of Hungary in the European culture to see the cause and effect relations and the effect of historical events on the development of our country. The integration of the sciences contributes to gaining complex knowledge in environmental studies.

In both options, the common requirements are set by the National Curriculum and the local pedagogical program on the one hand and the matriculation exam on

the other. Both options are flexible and allow students to change their orientation; they are also free to select the subjects in which they wish to receive extra classes in the last two years of their studies. Thus it is possible for students to reconsider their previous choice.

#### **Teaching information technology**

We are witnessing a movement towards a “society of information”. Access to information is the prerequisite of social and economic development. Students should be familiar with the basics of computer science. They are familiarized with the ways computers can assist them in their everyday activities, i.e. how to use word processors or how to handle databases. Great emphasis is given to the utilization of the enormous source of information on the Internet. The use of multimedia in the different phases of the teaching process (practice, testing, simulation, etc.) is one example of the various ways in which computers can be employed in our life.

#### **Teaching fine arts**

The aim of artistic education (literature, motion picture, music, drawing, and the history of arts) is to develop a sense of beauty and harmony as well as to help students in forming artistic judgements. Special attention is given to the works and lives of the famous Hungarian artists. Our aim is to make students capable of recognizing the values of art, to be in a position to judge a difference between the lasting values and the superficial works of art. By developing students' sense of harmony and their attitude toward preserving the values, we would like to strengthen their desire to protect the human environment.

#### **Teaching physical education**

Our school seeks to harmonize mental and physical education. A healthy way of life can only be achieved by regular exercise. Physical education classes, mass sport meetings and sport club activities are the sites where students can improve their fitness. These activities will hopefully contribute to creating a need and demand for physical exercise in most of our students in their later lives. Apart from training the body, sports are also a means to train the citizen, i.e. students learn to cope with the responsibility of being a team member, how to abide by the rules and how to cope with success and failure. Students can get acquainted with some of the winter and summer sports, e.g. skiing, canoeing. We have school teams in basketball, baseball, and football, three branches of sport our school pays special attention to.

#### **School and family**

Institutionalized education can be effective if it is in accordance with family intentions, learning and behavioral patterns. We believe that a good relationship

between school and parents does not come by itself; we have to work on it, maintaining a constant dialogue with parents.

By organizing students' activities, we define those aims and relations that will later determine our students' lifestyles, learning habits, to some extent their ambitions and personality too.

At the same time it is obvious that parents reflect the requirements of the society, and they influence our work with their opinions and decisions. We would not be able to reach our goals without their co-operative support.

*Parents' meetings* – held at least twice each year – could also help us to be in contact with the parents. On these occasions, the parents have the opportunity to meet the principal, the form teacher, and the other teachers. Besides these formal meetings, we wish to make parent-teacher relations natural, so that either party can propose a talk and solve problems mutually if needed. Though in general we are in an exceptionally favourable situation, since the majority of our students live in normal conditions and have a motivating background, which encourages them to go on to higher education, we have to face the pedagogical problem that a growing number of students come from broken families. Parents in each form may form committees thus helping the work of the form teacher. Representatives of the parents take part in the activity of the School Board.

### **Extracurricular activities**

The system of extracurricular activities serves various purposes: dealing with slow learners, guiding the gifted, entertainment, and utilization of free time. The various study circles, where students can pursue their individual interests, are of extreme importance. The János Selye biology and the Sándor Szalay physics self-study circles have a great tradition in our school. Those who are interested in arts are free to choose from the following activities: drama circle, film club, choir, ceramics, and photo study circle. Summer language camps are organized every year in the foreign languages taught at our school (English, French, German, and Russian) where students can improve their language skills with the help of native speaker teachers.

Our students are encouraged to take part in various competitions: National Competitions and other competitions organized on a county level. We help them to prepare for these competitions. Students can take part in editing the school newspaper and making programs for the school radio. Being a UNESCO associated institution we are entitled to join several international projects related to environmental protection or projects that aim at promoting mutual understanding between the different nations of the world. We have also taken part in international student exchange programs with schools in Finland, Italy, Lithuania, and France. Besides language practice in real life situations these visits also widen our students' knowledge about the culture, history, and customs of other nations. These exchange programs were very useful, so we seek to maintain and find new contacts with schools abroad. We maintain regular contact with the Hungarian Ady High School in Nagyvárad. The sport activities mentioned earlier also aim at giving students an opportunity to spend their free time in a most useful way.

The programs of “Kossuth Week” give students an opportunity to enlarge their knowledge in different subjects, politics and arts in a more relaxed way.

Fresher camps organized for the first year students both in the four-year and six-year programs help their integration into the new environment. Here they can get more information about school regulations, local customs and traditions, and the requirements. To develop students' self-realization, we organize personality-guiding activities, mental hygiene programs and training.

School trips have the purpose of raising the awareness of national identity. These excursions help students to appreciate the cultural and environmental heritage of our country. They also play a major role in the process of socialization, in learning the roles and norms of social relations. Field trips are also organized for students who specialize in various subjects. The participants of these trips can see how theory and practice correlate.

The traditional school commemorations (school year opening ceremony, Kossuth anniversary, the martyrs of Arad, the 1848-49 revolution and war of independence, the 1956 revolution, the school leaving ceremony, school year closing ceremony) are in line with our pedagogical aims.

The school gala gives our students an opportunity to show their talents in drama, music, and dancing to their fellow students, teachers and parents.

### **School council**

This is the forum for dialogue between students and teachers, for the safeguarding of students' interests, and for the organization of student life. The effective functioning of the school council contributes greatly to creating a democratic attitude and way of life. The directorate consists of the elected representatives of the forms. The representatives can voice their opinions and make critical remarks at the annual students' assembly.

The school council gives its opinion on school regulations, they organize the editing and publication of the school magazine, they run the school radio, and the “Kossuth Club”. The Council takes part in the organization of various programs and extracurricular activities, such as the traditional self-governing day, the initiation of first year students, balls and parties. We try to call attention to the balance of rights and duties. Involvement in the activities of the school council encourages students to be more dynamic members of the community.

Our aim is to become a “model school” through a continuous development of our professional activities. It requires us to widen our knowledge in the subjects we teach, in methodology, pedagogy and psychology and computer studies, and to put into practice the newest findings in these fields, with special emphasis on the use of the multimedia-library. Being a teacher training school, we will also take part in the near future in the new teacher training program of the university.

After the year 2000, when the present school building goes back to the Protestant Church we hope that we will have favourable conditions in the new building which is under construction.

The instruction and education going on in the Lajos Kossuth Teacher Training School of University of Debrecen aims at giving our students a deep knowledge,

developing awareness of their national identity and a sense of moral values. As a result of the work of the teaching staff and the trainees, our students acquire a maturity certificate, which meets the European requirements and opens the gates to higher education for them. Trainees who do their teaching practice with us get useful experience and motivation for their chosen career.

We wish to be an elite grammar school in the noblest sense of the word; that is why we pay special attention to our gifted students; we spot them, select them and guide them. We want our students to realize that there is no success without hard work, which often requires sacrifices.

[In: László Balogh & László Tóth (Eds.) (1999), *European perspectives in gifted education*. Debrecen: Department of Educational Psychology, Lajos Kossuth University. 109-117.]

# **The Significance of Mathematics in Martial Arts – or: Interest Based Enrichment Programmes at Mihály Fazekas Primary School, Debrecen**

FERENC MEZŐ

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## **The school**

Debrecen, the second largest city in Hungary, is the regional centre of the North-East, it is the seat of Hajdú-Bihar county, an industrial and university town. Mihály Fazekas Primary School can be found in the heart of the city.

Mihály Fazekas Primary School has long experience in educating ethnic minority Romany children, whose numbers in the school population has been increasing in the past twenty years. Today it is seventy percent. The institution undertook to educate the Romany children, consequently, the Educational Programme (A Fazekas Mihály Általános Iskola Pedagógiai Programja, 1998) was also made up accordingly. Besides developing certain abilities, the school has been paying attention to the improvement of high abilities. The school motto is ‘Every child is good at something.’ The pupils’ success in music, sports and arts influence the results achieved in their studies in a favourable way (the ‘transfer phenomenon’ is beginning to show itself).

## **The students**

Most students of Mihály Fazekas Primary School come from socially disadvantaged families and their performance in the school varies (as a rule, it is rather poor for their abilities). A number of families are socially disadvantaged in several respects: low income, an unhealthy way of life, poverty, low consumption, underfeeding, miserable living-conditions either in the rundown flats of the inner city or on the outskirts, where infrastructure is not developed. All these factors reinforce each other and manifest in the school-achievement of the children.

Is it possible, however, that these students are gifted? The definition of talent always depends on the conception of giftedness applied. In the history of talent scouting we can find different conceptions (c.f. Terman, 1925; Scheifele, 1953; Otto, 1957; Marland, 1972; Renzulli, 1978; Cohn, 1981; Foster, 1981; Mönks, 1983; Gagné, 1985 etc., in: Habermann, 1989; Mönks – van Boxtel, 1996; Sternberg – Davidson, 1996). In the light of the school motto and the above we can say that each and every child must be gifted in one way or another. Experience of long

years shows that the pupils of the school are extremely talented in sport, music, arts and dancing. But, is it possible that they are intellectually gifted as well? The answer seems to be yes, as their IQ is sometimes above average (120 or above).

Summarising a psychology survey carried out in the school from 1997 to 1998, we can say:

1. Even the intellectually gifted children may, sometimes, struggle with learning-technique problems (they may not be able to organise and search). (c.f. the results of Balogh – Dávid – Nagy – Tóth, 1993, which show that high intellectual abilities are not automatically accompanied by effective learning methods);
2. The pupils' motivation in the school seems rather instrumental (they learn for the mark and not because they want to improve their skills.)
3. The observation of and the interviews with the children revealed their special fields of interest as:
  - watching and imitating action and karate films,
  - 'reading' comics (rather than books),
  - playing with computer games.

Given this information, we organized the following interest based enrichment programs in the school:

1. A Self-defence Club (based on their interest in action and karate films)
2. A Comics Creating Club (based on their interest in comics)
3. A Video ABC-Film Creating Club (based on their interest in films)
4. FazekaSoft-Software Creating Club (based on their interest in computer games)

## The programs

The selection of the pupils taking part in the programs is very difficult, as all of the activities have become very popular. It is small wonder, because they are all based on the interests of the children. Therefore, personal preference serves as the starting point for selection, but motivation and persistence are continuously assessed later on. Sometimes a teacher asks for a place for a child.

Participation in any of the clubs is free. The school psychologist is in charge of the program, which is one of his responsibilities. If participation were not free, the children or their families could not afford to pay for any of these activities.

The target-system of the programs involves a direct and some indirect targets, too. The direct target is revealed to the students. It is always identical with the name of the club (learning self-defence, how to create comics or films and computer software). The children may or may not be informed about the indirect targets, however, which may include:

- the realisation of an enrichment program
- keeping constant learning motivation alive
- the improvement of school achievement
- considerable decrease in failure

- decrease in unjustified absence
- improvement of the continuation of studies index
- through career orientation students should learn about possibilities, professions that suit their interest and abilities, they should form a realistic image of the future
- the improvement of the teacher-student relationship
- the development of personality: the development of self-knowledge, self-evaluation, communication and social relationships
- setting themselves a real target in life, they should learn what they are capable of, they should experience that they are not helpless and that they can cope with problems in life

What are the main priorities of the *Self-defence Club*? The child grasps the rudiments of ju jutsu (one of the traditional Japanese martial arts). ‘Ju’ means ‘soft’ and ‘jutsu’ means ‘art’, so ‘ju jutsu’ means ‘soft art’, which may be a misleading name because it is a very hard and many-sided sport. They learn that hygiene is an integral part of self-defence (washing, body care, dental hygiene are frequent problems), they also learn how to keep to the rules (to prevent criminal behaviour). They find out about verbal means of solving conflicts, and gain knowledge about the world. During training (in the gym) we always find some connection with school subjects. For example:

- History: the cultural history of the martial arts from ancient times to the present day, great battles and generals;
- Biology: the physiological effects of attacks, first aid;
- Physics: to understand the rules of dynamics and statics (throws, levers way-time-speed-power relations);
- Mother tongue: techniques of argumentation, formalities, dispute culture;
- Mathematics: from the (time-money-ration per head) problems of the supply of the army to the battle-formation’s area-circumference calculation;
- Geography: map-reading, characteristics of regions, orienteering skills.

Resources: sports jackets and flannels, a tatami (Japanese bulrush carpet) or other sport-carpet.

What are the main priorities of the *Comics Creating Club*? The topics range from the cultural history of comic strips to the genre characteristics and the ethic of comics. In the club the children create comics on a special theme (everyday problems, syllabus etc.). Therefore, the comics and the classes can shed light to different aspects of their life from life in the family, through friendship and love to difficulties at school. This club works in a classroom. The resources are paper, pens and pencils.

What are the main priorities of the *Video ABC Club*? The children get to know the aspects of film-making (the role of the script-writer, the cameraman, the director, the producer and that of the editor etc.). However, the film – similarly to the comics – can shed light to the life of the children making it. The genre of the films can be documentary, educational or feature (from action to sci-fi). The head of the school allocated a classroom to the VIDEO ABC Club. The resources of the club are a video camera, cassettes, and a video cassette recorder.

What are the main priorities of the *FazekaSoft Club*? The motto of the club suggests that making your own computer software is fun and that it is child's play. The children get acquainted with the basis of an advanced visual programming language (Visual Basic). After a few occasions (5-10 sessions), they can make computer programs (e.g. for solving equations in mathematics, physics, etc., or puzzles in strategic games or multiple-choice tests). They may learn how to compile interactive books/course-books. The Club attracts some of the pupils who have a reputation for bad conduct and poor school performance. The same children seem to be well-behaved and successful in the Club, which has its sessions in the computer room of the school. Other resources are the computers.

The products of the clubs (films, comic-strips and self-defence skills) can be widely used. For example:

- they can be part of some programs (the School Foundation Gala, Carnival, or other occasions),
- they are covered in the school magazine,
- they are used as classroom decoration or teaching aid,
- the school can organize events to present these products
- they can be interesting and unusual gifts,
- they can serve as the starting point for some other project etc.

The work in the clubs means interesting, exciting and challenging activity to the students and the program-manager alike.

## Summary

In Mihály Fazekas Primary School some pupils (even the gifted) have special social, learning, and conduct problems. Their general characteristics are: high intellectual abilities, instrumental motivation in the school, special fields of interest (action films, comic-strips, computer-games) and an underprivileged social background. Given all these, some interest based enrichment programs have sprung up in the school (a Self-defence Club, a Comics Creating Club, a Video ABC – Film Creating Club and FazekaSoft, a Software Creating Club), where participation is free. These programs have become very popular among the pupils, and they realize a number of direct and indirect targets.

In the future, we are planning to focus our attention on the communicative skills of the children because they do not seem to possess the necessary social skills in their personal relationships and communication. Good communicative skills are indispensable for maintaining personal relationships and for achieving success in life, furthermore, they also enable us to understand each other better and to adjust to different groups. Therefore, we will start a Social Experience Training Programme that will enhance the children's development in this field, thus making it easier for them to integrate into society. During the programme we will apply the social learning method.

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# **Talent Management and Personality Development in the Primary School of Újkert Educational and Community Centre**

TÍMEA VIZI

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Újkert Educational and Community Centre (UNOK) first opened its doors twenty years ago on a housing estate with 30.000 inhabitants in the city of Debrecen. This unique complex houses a kindergarten, a primary school, a hall of residence as well as a community centre with sport facilities and a modern library, which mainly serve the residents of the housing estate.

The school and the kindergarten have long put great emphasis on the development of children's personalities, as well as the recognition and exploration of their inborn capabilities. Some additional priorities are: providing help in the socialization process, the development of socio-emotional and cognitive factors, and the correction of any potential disorders, which are extremely important since Újkert is a typical big-city housing estate, where alienation, the lack of communal traditions, and the high rate of unemployment contribute to a feeling of insecurity and rootlessness, and, in many cases lead to alcoholism, deviant behaviour and the disintegration of families. Such problems are usually rooted in existential difficulties, dysfunctional families, and the questioning of traditional values.

The main findings of my socio-cultural background survey conducted in January 2000 are the following:

1. In more than 1/3 of the families there was only one parent.
2. 28% of the fathers and 44% of the mothers were unemployed.
3. 85% of the respondents had been in a particularly difficult situation during the past 3 years, while 37% of them had struggled with continuous difficulties for a longer period of time.
4. Predictions: 6-7% expected improvement.
5. Guardianship authority: 10%
6. Parental expectations regarding the school:
  - education, personality development
  - conveying knowledge
  - development of individual capabilities, correction
  - providing opportunities for leisure activities.

As we can see, in addition to teaching, the parents have important expectations regarding socialization and education. Let us consider how the development of individual capabilities and that of the pupils personalities is realised through compensation for their individual 'weaknesses'.

### **The Prevention group**

In November 1998, a prevention-working group was officially set up in the institute. Well before that time, its members, including people with expertise in development and mental hygiene in kindergartens, social work in child protection, speech therapy and psychology, had been working in co-operation.

Consequently, a considerable number of connection points have spontaneously developed during their work, but some complex and difficult cases have also made the creation of a team of experts representing different specialisations necessary. Regular consultations and discussions of the cases were introduced, which have been in practise ever since. At the beginning of each week the specialists come together to discuss the current tasks, as well as the problems and the successes of the previous week. Analysing the results of the examinations and the screenings they point out the further steps to take and the possible directions for development. The experience and the problems of conversations and therapies are also discussed during these meetings. Each team member maintains regular professional ties with other institutes of mental hygiene and the teachers working in the school.

### **Child protection-social work – assistance to families**

The responsibilities of the social worker specialised in child protection include visiting families, either together with the form-teacher or one of the family assistance staff, or without them, alone. It is problematic sometimes to visit remote rural farms, since roads are often impassable during the autumn-spring months, and therefore visits are sometimes postponed until later. The social worker is also responsible for keeping track of absences, extended illnesses, and she provides assistance to newcomers to fit into the community. It is also the social worker's responsibility to assess needs and establish eligibility for assistance with the cost of school meals, that of textbooks and other fees. Assistance also includes the following:

- regular collection and distribution of clothes and shoes
- providing assistance to parents requiring help with forms and documents: obtaining the necessary forms, interpreting them and helping parents with filling them in and providing information on opportunities
- keeping regular contact with teachers, residence hall teachers, kindergarten teachers
- providing family counselling on lifestyle issues for those in a social crisis situation
- counselling children, thereby assisting psychologists
- co-operation with childcare authorities, the police and child welfare services – representing the children's interests
- mediating and promoting the communication between the families and the school/kindergarten.

### The responsibilities of the psychologist

1. Psychodiagnostics, i.e. screening, questionnaire surveys, tests, sociometric analyses, school maturity examinations. On the basis of the tests, she may suggest special therapy, additional tests or exemption from certain subjects. Educational Counselling, taking part in the work of Expert Committees.
2. Assisting form teachers in their efforts to form communities. Providing regular consultations on educational problems, organizing special awareness groups. This year, for example, representatives from the Drug Ambulance and the Crime Prevention Department of the Police were invited to talk to the children about substance abuse, juvenile crime, victimization, peer-pressure and drifting, etc. The psychologist also assists in the work of form teachers and kindergarten teachers with sessions on self-knowledge and communication skills, if required, and takes part in parent-teacher association meetings and educational discussions, if necessary.
3. The psychologist reveals the causes of failure in studying, and looks for possibilities of correction; keeps track of the integration of first formers and newcomers into the community, and helps senior class pupils in career orientation and selection.
4. Advises families on problems, the children may have in school or in kindergarten, and, if necessary, conducts a systematic approach family therapy as well.
5. Regularly observes kindergarten groups and conducts preventive studies; cooperates with the kindergarten development specialist in personality development and talent improvement.
6. Provides psychological support to teaching colleagues in the case of personal and professional problems. Takes every effort to prevent the “burn-out syndrome”.
7. Acts as liaison with family assistance staff and the childcare authority, issues opinions, represents the children’s interests in various hearings and discussions.

### The responsibilities of the development specialist in kindergartens – preparing children for school

1. The specialist works with 27 children in 19 hours per week according to schedule. It proves incredibly difficult to acquire the necessary equipment for development each year. Individual development is carefully planned and small group sessions for correction and making up are timed with the utmost care.
2. Besides having regular group sessions with the children, she also keeps contact with the parents in the form of discussions and counselling. (She informs them on further examinations needed, the development of the child, as well as the maturity or immaturity for school.)
3. She is also expected to keep contact with and give advice to the kindergarten teachers and observe the middle and junior groups during playtime on a regular basis.
4. She is actively involved in the educational and professional work of the kindergarten (e.g. the making up of pedagogical programs, continuing education, etc.)

### The responsibilities of the speech therapist

As an expert delegated to the institute, she primarily works with kindergarten children and first through fourth formers. In the kindergarten, her main task is to start and correct speech, while in the school, the prevention of dyslexia and the correction of faulty learning become dominant. She conducts diagnostic work both in the kindergarten and in the school. In serious and complex cases, she coordinates further specialized examinations. She keeps contact with the teachers and provides them with advice as needed. In 1999/2000, altogether 71 children took part in speech therapy sessions. The most common speech disorder was dyslalia. Currently, there is one dyslexia correction group having regular weekly sessions. The 19 hours per week, allocated to the school, would be sufficient for 35-40 children, as we know from the literature. At present, she works with twice as many children, which is clearly detrimental to the efficiency of her work.

Most kindergarten children with speech defects also lag behind in other areas. The development specialist also takes part in the attempt to help these children improve. In addition to lisping, cases of belated and hindered speech development dysphasia are also found.

### Forms and methods of talent development – the management of professional teams

One of the most important requirements of the pedagogical program of the school is to help talented pupils develop according to their capabilities, which can be enhanced through organizing *differentiated classroom activities*. *Study circles*, set up in almost every school subject, offer a wider scope for talent management, making it possible for the children to reap maximum benefits, even prepare for competitions. We should make mention of the soroban group, also involved in talent management, which has been active in our school for ten years. It provides excellent possibilities of improving the creativity of talented pupils as well as their calculation skills, which first develop with the help of the tool, but afterwards, they considerably improve when the children perform mental calculations as well. The use of the soroban helps the pupils develop their attention, self-discipline, concentration skills, and formal memory, all of which, naturally, affect their performance in other subjects as well.

Pupils are divided into groups according to their abilities in foreign language classes. Those with the best gift for languages may study English or German in an increased number of classes. In the last school year, German language elective classes were also introduced in the fifth and sixth forms in addition to English. Pupils get a certificate at the end of the school year. As regards Hungarian language and Literature, electives were also introduced two years ago in the eighth form. This format provides an opportunity for more in-depth work with talented pupils due to the smaller size of groups and the division of classes according to abilities. Regular events include:

1. Intramural competitions of various levels, e.g.:
  - intramural correspondence competition in Hungarian language and literature (30 pupils, Classes 5-8)
  - intramural correspondence competition in foreign languages (88 pupils)
  - intramural chess tournament
  - intramural competitions in mathematics, chemistry, computer science
  - intramural “Zrínyi” competition: for first-entry third and fourth formers. The objectives are helping children get experience, practicing time management skills, optimising decision making.
2. Participation in county and national subject competitions, e.g.:
  - György Hevesy Competition in Chemistry (Classes 7- 8)
  - Ottó Herman Competition in Biology (Classes 7- 8)
  - Károly Kaán Competition in Nature and Environment
  - Ilona Zrínyi Competition in Mathematics
  - German Language Puzzle Solving Contest
3. The institute's own, independent programs, e.g.:
  - “Spring in Újkert”, poetry recital, folk song singing, German and English language prose recital competition (220 competitors representing 11 schools from Debrecen and 9 from the country)
  - County Folk Song Competition
  - County Prose Recital Competition—great interest. Objective: popularising texts for reading assignments.
4. Classes Catering for Special Interests, e.g.:
  - those given by experts from outside the school (astronomers, biologists, police officers, traffic wardens, etc.)
  - those held by learning skills specialists
  - library classes
  - those that are held after going to the theatre or a puppet show to discuss the performance
  - media studies classes
5. Art Clubs:  
Writing Poetry Club, Young Writers' Club and Conversation Circle. They provide possibilities for the children to gain first-hand experience in creative, artistic work. Children mostly encounter literary works only as recipients, thus, the creative approach opens up new prospects. Structurally, these sessions are also different from traditional formats: pupils of any age may take part. In these mixed-age groups the pupils may assist, teach, and direct each other with their opinion and advice. The authors present their work at larger school ceremonies and events.
6. The School Theatre and the Drama Circle play a special role in talent enrichment. As an experiment, two drama classes are added to the curriculum of class 2/a every week, where reading assignments are dramatized, thereby helping the understanding of the texts. In addition, this also provides an opportunity for the development of creativity, communicative skills and self-expression.

sion. Hopefully, as a result of getting involved personally, the children will get to like reading itself. Taking part in the performances provides a sense of achievement for the pupils as well as their parents. The Drama Circle for the senior classes sets the same objectives. The most talented performers participate in a gala program at the end of each year.

7. In music education, special curriculum classes provide an opportunity for developing talented pupils. Unfortunately, however, this program is going to come to an end in the school. There is also a choir practising 4 hours weekly, which can boast of significant success for the past years.
8. Physical education and sports are areas of special importance in the pedagogical program of the school.

One specific feature of the school is talent management in each class, through the work of physical education special curriculum groups. By getting involved in the National Athletic Program, pupils in the junior classes now have more competition opportunities than before. They regularly achieve good results at the Student Olympics.

Another pride of the institute is its swimming program, which was initiated at the proposal of the head and the staff of the school as part of the optional part of the curriculum. Special note must be made of the regular swimming sessions of the small group and corrective classes, in which motion co-ordination, volitional properties, attention and endurance have greatly improved, as a result.

All pupils are members of the Sport Circle. The children actively involved in sporting activities may choose to participate in swimming, football, handball, volleyball, athletics, basketball and gymnastics clubs. The Sport Circle also contributes to mass sports and intramural programs by organizing its own events (swimming pool competitions between the schools of Újkert, the "School-Run", Santa Claus Volleyball Tournament, etc.)

The physical education staff pays special attention to pupils with motion disorders by organizing adapted physical education groups, where therapeutic spinal gymnastics and therapeutic swimming are the target.

## **Summary**

I attempted to summarize above the pedagogical practice and professional background of talent management and personality development in the primary school of UNOK. This colourful variety could not be offered without the enthusiastic and conscientious work of the teachers, devoted to their profession.

## **Part Three: Studies on Effectiveness**



# The Development of Personality, Abilities and Social Relations in a Special Class

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Two years have passed since our first report on the project with primary school children at Törökszentmiklós. New results indicate that participation in the project has accelerated the development of abilities, has led to mainly favourable personality changes and has promoted the formation of advantageous social structures in the classroom. In the future, in addition to increasing support for the children's personal wellbeing (for instance, provision of more free time, promotion of communication skills), the work of four terms will be completed in three.

In an earlier paper (Balogh & Nagy, 1990), we reported on a project, which had been launched at Törökszentmiklós in 1987 with the aim of developing the abilities of school children showing talent. The initial report outlined the organisational framework and summed up the experiences of the first year. Two years have elapsed since then, and the following questions have come into focus:

- How is the development of the child's abilities affected by removal from the familiar peer group and exposure to the challenge of a complex program aimed at accelerating the evolution of talent?
- How does the new social milieu with associated peer group rivalries affect the child's personality?
- What are the group dynamics of the experimental class; are these dynamics appropriate for intensive talent development?

## Results

In the following we summarize results for the two classes which have taken part in the project so far, with particular emphasis on the three questions posed above. One class took part in the talent development program from 1987-89, the other between 1988 and 1990.

### 1. Results of IQ tests

After starting their studies, the children were examined using the Hungarian standardisation of the appropriate Wechsler intelligence test. The testing was repeated after two years, when the pupils were about to leave school. The results were as follows (Table 1):

**TABLE 1**  
**Mean IQs of program participants**

	Class A		Class B	
	1987	1989	1988	1990
IQ	124.94	129.15	130.80	133.75
VQ	120.91	125.33	130.15	131.95
PQ	123.84	126.84	124.00	129.50

In both classes several children moved into higher intelligence categories (e.g., from “above average” to “very high”). This is an indication of the fact that they possessed potentials, which developed into abilities as a result of the intensive program. Naturally, at the end of the 8<sup>th</sup> form it was the standard appropriate to the age, which provided the basis for classification, so that these data show the progress that can be expected beyond normal development. The data showing the direction and magnitude of the changes in the categories are very informative (see Table 2).

**TABLE 2**  
**Changes in IQ categories**

	Class A	Class B
Improved 1 category	6 children	8 children
Improved 2 categories	3 children	—
No change	9 children	12 children
Became worse	1 child	—

The child whose IQ category became worse belonged to the upper category. Other observations and examinations showed that the cause of his worsening was personality problems.

Taking into account the results of the individual subtests the following can be stated:

- In the verbal tests the following ability tests developed most: quickness in association, memory, abstraction.
- In the performance tests mainly the following showed development: perception, psychomotor quickness, part-whole relations, spatial orientation.

## 2. Results of personality tests

In the personal examinations, the California Psychological Inventory was used. This test analyses the basic dimensions of a normal personality, and its 480 items are arranged into 18 basic scales. The following changes occurred in test scores between the beginning of the 7<sup>th</sup> and the end of the 8<sup>th</sup> form: Scores increased on self-assurance in social behaviour, level of self-acceptance, self-knowledge, flexibility of thinking and personality, achievement of good results through autonomy.

Mean scores decreased on general wellbeing (only in class A), desire to create a good impression in others, role of outside incentives, tolerance (only in class A).

The cores showing an increase unmistakably indicate positive changes. However, the scores where a decrease occurred warn of the need to take greater care in developing the pupils' personality; otherwise, in the long run distortions may occur which in turn will unfavourably affect the evolution of abilities. Of course, the change in every single factor must be studied individually, as decreases do not in themselves always mean a negative change; e.g., the decrease in desire to create a good impression may also refer to the development of autonomy, and this is a positive tendency, while a decrease in the importance of external incentives does not pose a problem in itself, either, since if this is accompanied by a growth in internal motivation it is a favourable change. This can be concluded from the end of term survey in the 7<sup>th</sup> class. Alterations in the program which take account of the results of the personality tests will be outlined in the summary. On the whole the tendencies mentioned above show that the new social milieu did not have an unfavourable influence on the children's personality.

### 3. Sociometric results

Sociometric examinations were carried out in the second year of the project with the aim of casting light on group dynamics in the class and ascertaining if they provided a satisfactory background for intensive talent development. Findings were as follows:

- The sociometric structure of both classes reflects the existence of differentiated task and achievement directed groups.
- A very high proportion of the children had mutual relationships in the social field (Class A: 100 percent, Class B: 95 percent). In both cases this number (the Mutuality index) exceeds the average (85-90 percent), indicating that the group provided security for its members. In both classes not more than one or two children felt lonely.
- The quotient showing the number of mutual relationships (Density index) among the group members was very high (Class A: 4.55, Class B: 1.5). A group can be regarded as stable if the index is above 1, which was true in both classes.
- In Class A 26 percent of the possible relationships in the social field were realised, in Class B 23 (Cohesion index). Cohesion is said to be high if this figure is above 15, which was true for both classes. In such a class great things can be achieved together.

### Summary

The results can be summarized as follows:

- Both school grades and IQ scores show that the development of abilities was not retarded by the special program, but on the contrary, it was accelerated as a result of removing the children from their former environment

and placing them in a new milieu with new influences aimed at promoting development.

- The new situation and influences brought about changes in the children's personality. Some of these are unambiguously positive, others, however, are considered unfavourable.
- An advantageous group structure was formed in the experimental classes. These classes are typically task and achievement directed groups, providing an ideal background to doing well both for the individual and the group.

We intend to go on with the project on the basis of our experiences so far. We will carry out a follow up study of the children in the secondary schools and onwards, since success or failure in achievement manifest themselves only in later years. Taking into account the test results and observations, we will continue to check our work and change our program, at least in parts. We intend to adopt the following recommendations:

- More attention should be paid to developing communication skills.
- More psychological counselling is need for the children, to help them assimilate their experiences and get to know themselves better.
- The pupils' general wellbeing should be fostered more strongly. For this reason we have made several alterations so far, for instance by introducing a free afternoon in the 7<sup>th</sup> form. In this way there is more opportunity for individual programs. We are also going to extend the range of contacts outside school: excursions, visits to the theatre, work in the library, etc.

With the current 7<sup>th</sup> class we are putting into practice a further idea; the children learn the subject matter of four terms in only three, leaving the fourth term free to develop the pupils' specific abilities. An essential part of this system is that the pupils take a final exam in the subject matter of the elementary school at the end of the first term of the 8<sup>th</sup> class. Our idea is to be flexible here: the pupil has the right not to accept the mark, and later has the opportunity to do better by repeating the exam. The program in the term rendered free has two parts: on the one hand every pupil has to take part in a 1-2 hour lesson every two weeks in every subject of the elementary school, with the primary aim of keeping basic knowledge and abilities up to the expected level. On the other hand, individual or small group lessons are organised for the children in subjects they choose, with the aim of bringing specific abilities to a higher level. One subject is obligatory for every pupil; there is no upper limit concerning the number of subjects chosen, but in our opinion more than three would not be desirable. It is also part of our plans that every pupil should pass a primary examination in one foreign language at the end of the 8<sup>th</sup> class. In carrying out these individual training programs we are also going to rely on possibilities offered by the town other than the school (secondary school, factories, culture centres, etc).

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# **Personality Development of High-ability Pupils Aged 10-14**

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## **I. Antecedents**

In the last decades in Hungary talent development did not take part in the centre of interest of education. Although there have been different forms of dealing with high-ability pupils in schools (special classes, study circles, optional subjects etc.) these were only partly able to solve the tasks of developing talent. Highly gifted children outnumbered those who had the chance to get in these classes, and the programs targeted on developing specific abilities (singing-music, mathematics, foreign languages etc.). School programs aiming at the identification, foundation and complex development of talent together were missing.

Since the second half of the 80's programs have only been launched with a complex method for the practical tasks of developing talent and an ever increasing attention has been paid not only to the development of abilities but to that of personality too. What has been emphasised by experts for a long time has become obvious in Hungary too, namely that without certain personality traits efficient talent development in school is hard to imagine (Bransford & Stein, 1993; Eysenck & Keane, 1993; Freeman, 1991; Mönks & Katzko, 1995).

Since the first ECHA conference in 1988 every time we have reported on the talent-developing program going on in Hungary in several schools for pupils aged 10-14. At every conference our results were interpreted from a different aspect (Balogh & Nagy, 1990, 1991, 1995). Important factors such as motivation, anxiety, success orientation, fear of failure, extroversion, social conformity have not at all been examined so far or only partly. Primarily the reason for this was that we did not have co-ordinated results from the different schools. Data from 5 classes (over 100 pupils) have been obtained by now and it is now possible to draw meaningful conclusions concerning the main aspects of the development.

In our presentation we are reporting the findings of 5 classes in 3 elementary schools (Törökszentmiklós, Mátészalka, Szerencs) with the aim to explore the reasons behind the tendencies as well. We have achieved fine results by the experimental program, such as the development of overall intellectual abilities, special talent development, the development of learning strategies and a good proportion in the number of pupils accepted to colleges and universities. Now we are going to analyse how the deeper layers of the personality have changed.

## II. Aims, applied methods

As it has been referred to earlier, our attention at the moment is focused upon the changes in personality traits, which play an important role in the development of talent. (Naturally, we cannot take on giving an exhaustive picture here.) Our findings can be grouped around four main aspects:

1. How do motives *in the background of school learning* get formed during our talent-developing program?
2. Characteristics of the change in *fear of failure* and *success orientation*
3. Changes in the *anxiety indexes*
4. Changes in *extroversion*

Ours was a follow-up study, surveys were made at the beginning of the developing program (at the age of 10 in the 5<sup>th</sup> class of the elementary school) and at the end of it (4 years later, at the age of 14 in the 8<sup>th</sup> class), in 5 classes from 3 different schools involving 114 pupils altogether.

In our surveys we used the Hungarian versions of questionnaires applied all over the world. For the first and second aspect Entwistle and Kozéki's motivational questionnaire (Entwistle & Kozéki, 1986), for the third one Spielberger's examination material (Test Anxiety Inventory; Sipos, Sipos & Spielberger, 1988) and for the fourth one Eysenck's questionnaire (Junior Eysenck Personality Inventory; Eysenck, Kálmánchey & Kozéki, 1981) was used. At the moment these are not going to be reported in details, the essential components of these methods as needed – will be presented with the results.

## III. Results

### 1. The development of motivational components

The essence of the motivational model in the background of the investigational method we applied can be summed up as follows: the school achievement and behaviour of the pupils are basically determined by three groups of motives. Firstly, by their affective-social motives expressed and formed in interactions with their teachers and peers; secondly, by their cognitive motivational group covering individual search during the activity, being present while they strive for competence and follow their interest; thirdly, by their moral motives comprising their self-esteem on the basis of conscience, their endeavour to meet the requirements and to shoulder responsibility.

Accordingly, the test is founded on the following system, presupposing 10 main motives in the background of school learning (Table 1).

**TABLE 1**  
**Main motives in school learning (Entwistle & Kozéki, 1986)**

1. EMOTIONAL WARMTH	need for care, affection
2. IDENTIFICATION	need for being accepted, mainly by teachers
3. AFFILIATION	sense of belonging (mainly to peers)
4. INDEPENDENCE	need to follow one's own road
5. COMPETENCE	need for acquisition of knowledge
6. INTEREST	responsiveness to novelty
7. CONSCIENCE	need for being trusted and valued, self-esteem
8. NEED FOR ORDER	need to follow values
9. RESPONSIBILITY	need for self-integrity, moral personality and behaviour
10. FEELING OF PRESSURE	feeling that teachers set unachievable high demands without understanding

We accepted this system as a basis for our estimation. We think it is sufficiently comprehensive as well as differentiated for us to explore the motivational background behind the pupils' school activity (Entwistle, 1981; Kozéki, 1980). The results are going to be considered from several aspects as follows.

According to the means of the classes a rank order of motives got formed in both measures (at the age of 10 and 14). We think the changes in the rank order illustrate well how the significance of motives in the background of the pupils' school achievement changed (Table 2).

**TABLE 2**  
**Changes in the rank order of motives in the classes**

Motives	Class A		Class B		Class C		Class D		Class E	
	M1	M2								
1. Emotional warmth	4.	1.	1.	1.	1.	4.	1.	1.	2.	1.
2. Acceptance by teachers	8.	2.	8.	2.	8.	5.	8.	4.	8.	4.
3. Belonging to peers	8.	2.	8.	2.	8.	5.	8.	4.	8.	4.
4. Following one's own road	9.	6.	9.	8.	9.	9.	9.	8.	9.	7.
5. Need for acquiring knowledge	1.	5.	3.	6.	4.	6.	3.	7.	3.	6.
6. Interest	7.	9.	7.	9.	6.	8.	7.	9.	7.	9.
7. Conscience	6.	4.	2.	3.	2.	1.	2.	2.	1.	2.
8. Need for order	5.	7.	4.	4.	3.	2.	6.	3.	4.	5.
9. Responsibility	3.	3.	6.	5.	5.	3.	5.	5.	6.	3.
10. Feeling of pressure from teachers	10.	10.	10.	10.	10.	10.	10.	10.	10.	10.

*Explanation:*

A, B, C, D, E: the 5 classes taking part in the program

M: Measure. Measure 1: at the age of 10; Measure 2: at the age of 14

N = 114 pupils; A=19, B=25, C=23, D=22, E=25

After the previous rough picture it is advisable to sum up the direction and degree of changes. The third table gives the comparison of the rank order means.

**TABLE 3**  
**Changes in rank order means of motives (N= 114)**

Motives	Rank order means of motives in summary of 5 classes		Degree of change	Direction of change in the 5 classes		
	Measure 1	Measure2		-	+	0
1. Emotional warmth	1.8	1.6	- 0.2	2, 1, 2		
2. Acceptance by teachers	4.6	6.8	+2.2	-, 4, 1		
3. Belonging to peers	8.0	3.4	- 4.6	5, -, -		
4. Following one's road	9.0	7.6	- 1.4	4, -, 1		
5. Need for acquiring knowledge	2.8	6.0	+3.2	-, 5, -		
6. Interest	6.8	9.0	+2.2	-, 5, -		
7. Conscience	2.6	2.4	- 0.2	2, 2, 1		
8. Need for order	4.4	4.2	- 0.2	2, 2, 1		
9. Responsibility	5.0	3.8	- 1.2	3, -, 2		
10. Feeling of pressure from teachers	10	10	0.0	-, -, 5		

*Explanation:*

-: The scores in the rank order decreased, so the role of the given motive increased.

+: The scores in the rank order increased, so the role of the given motive got weaker.

0: No change took place in the rank order.

Measure 1: at the age of 10

Measure 2: at the age of 14

*Conclusions*

1. After two years the significance of the following motives has increased:

- a) belonging to peers
- b) following one's own road
- c) responsibility
- d) emotional warmth
- e) need for order
- f) conscience

Three of these belong to the moral motivational group (c, e, f), two to the affective-social category (a, d) and one to the cognitive group.

2. The significance of the following motives has decreased from the age of 10 to 14:

- g) need for acquiring knowledge
- h) acceptance by teachers
- i) interest

Two of these belong to the cognitive motivational group (g, i) and one to the affective-social one (h).

3. On the whole the tendency of the change is favourable since the significance intensification of the moral motivational group proves the development in the autonomy of the children's personality. In the long run it is important from the aspect of developing talent, too.

4. The significance of two elements out of the three in the affective-social motivational group has increased, which is a positive tendency. This shows that despite

the marked competition in the class the personality element did not get distorted during the developing program. This is also appreciative of the teachers' work.

5. However, the fact that the role of two elements out of the three in the cognitive motivational group got weaker cannot be regarded as a favourable change. This is unfavourable because in the long run the need for acquiring knowledge as well as interest must be present in the background of successful activity (and development).

Looking for the reasons we think that this unfavourable tendency comes from our failure to offer a choice rich enough to find the fixed points between the pupils' school work and interest around the compulsory school material, despite all the efforts that the schools participating in the program made. The developing program must be made more colourful in the future, offering a more versatile complementary program.

6. It is purposeful to compare our results with those of the rank order of the Hungarian standard (Kozéki & Entwistle, 1986). (Table 4.)

**TABLE 4**  
**The rank order of our measures and the Hungarian standard**

The rank order of our measures at the age of 14 (N= 114)	The rank order of the Hungarian standard
1. Emotional warmth	1. Emotional warmth
2. Conscience	2. Responsibility
3. Belonging to peers	3. Conscience
4. Responsibility	4. Following one's own road
5. Need for order	5. Belonging to peers
6. Need for knowledge	6. Need for knowledge
7. Acceptance by teachers	7. Need for order
8. Following one's own road	8. Interest
9. Interest	9. Feeling of pressure from teachers
10. Feeling of pressure from teachers	10. Acceptance by teachers

With our pupils belonging to peers, need for order and acceptance from teachers are at the top of the rank order, preceding those in the standard by at least two places. In the standard, however, responsibility and following one's own road are more pronounced in the rank order among the motives (they are at least two places earlier) than with our pupils. In case of the motives interest and need for acquiring knowledge (the ones mentioned previously as problematical) the rank order was almost identical. The less significant role of these motives seems to be a tendency with Hungarian school children at this age.

7. Another data series, which prove how motivated the children in the developing program are, is also worth considering, namely the standard scores of the 3 motivational groups as well as the means of our pupils (Table 5).

**TABLE 5**  
**Comparison of the means in the 5 main motivational groups**

Motivational group	A	B	C	D	E	Standard
Affective-social	74.1	70.7	70.0	74.2	72.1	50.60 (max. 90)
Moral	73.2	72.8	74.2	76.7	73.4	53.23
Cognitive	68.3	66.0	65.4	71.6	67.8	49.28

*Explanation:*

A, B, C, D, E – the mean of the 5 classes taking part in the program, age 14  
N= 114; A= 19, B= 25, C= 23, D= 22, E= 25

These data clearly indicate that our children are much more motivated to study than the average Hungarian schoolchildren. This is very important since after getting on to secondary schools at 14 they are in possession of favourable motivational bases to further develop their talent.

## 2. Failure and success orientation

The pupils' school achievement is considerably influenced by these two factors, which was the reason why we regarded it important to monitor them during our program. Success orientation urges the pupil to do as well as he can in order to sustain his self-esteem. Fear of failure means a constant fright of lagging behind, of doing worse to the others. Of course, to a certain extent both are present in the pupils' school achievement, however, the relationship between the two factors is not negligible. Generally, success orientation stronger than fear of failure has a favourable influence on performance.

In our measure Entwistle–Kozéki's learning orientational questionnaire was used. Among others it is also suitable for examining the above two factors (cf. Entwistle & Kozéki, 1986). The summarised result of our examination can be seen in Table 6.

**TABLE 6**  
**Changes in fear of failure and success orientation**

	A		B		C		D		E	
	M1	M2	M1	M2	M1	M2	M1	M2	M1	M2
Success orientation (max. scores 30)	18.45	16.5	19.9	17.56	17.2	17.83	20.5	15.8	17.9	14.61
Fear of failure (max. scores 30)	18.30	15.5	20.8	20.12	22.9	20.74	20.8	17.8	19.8	17.91

*Explanation:*

A, B, C, D, E: the mean of the 5 classes taking part in the program  
M1: at the age of 10, M2: at the age of 14  
N= 114; A= 19, B= 25, C= 23, D= 22, E= 25

As scores decreased in almost every case, they do not say much by themselves. However, it would be interesting to see if the difference between the two factors increased or decreased or what direction changes took in the difference. This is summed up in Table 7.

**TABLE 7**  
**Changes in the difference between the means of fear of failure and success orientation between the two measures**

	A		B		C		D		E	
	M1	M2	M1	M2	M1	M2	M1	M2	M1	M2
Success orientation	+0.15	+1.0								
Fear of failure			+0.9	+2.56	+5.7	+2.31	+0.3	+2.0	+1.9	+3.3

*Explanation:*

- A, B, C, D, E: the mean of the 5 classes taking part in the program
- The scores show the difference between the class means of the two factors between the two measures. In case of the second measure the higher scores occurred in the factor where indicated.
- N= 114; A= 19, B= 25, C= 23, D= 22, E= 25

*Conclusions*

1. The picture is not favourable since both in the first measure (age 10) and in the second (age 14) fear of failure was stronger in four classes.
2. In the class where success-orientation was the strongest already at the outset, the difference increased to the advantage of this factor, which is very positive and testifies to a successful pedagogical activity.
3. In one more class out of the four a favourable change could be observed (C), where the difference between the two factors decreased. Although no dominance of success-orientation could be seen, its position became better as compared to the first measure.
4. In three classes, however, the difference increased to the advantage of fear of failure, which is obviously an unfavourable tendency.

### 3. Changes in anxiety values

It is well known that achievement is considerably influenced by anxiety (Bundschuer & Brox, 1992; Bhaskara, 1992; Kovac & Matejik, 1992; Spielberger, 1972), so its changes were also important to monitor during our program. The results of boys and girls will be presented separately, as there are separate standards available. Table 8 shows the results of girls, Table 9 those of boys. The Spielberg's questionnaire we used measures three indices of anxiety in task situation. The worry score shows the intensity of the pupils' thinking of the negative consequences of the achievement in task situation. The element of emotional excitement refers to the vegetative symptoms of the reaction induced by the task situation (Sipos, Sipos & Spielberger, 1988).

**TABLE 8**  
**Changes in anxiety indices with girls (N= 64)**

	A (10)		B (12)		C (17)		D (13)		E (12)		Standard
	M1	M2									
Total scores (20-80)	35.2	33.6	44.5	51.3	47.5	46.7	38.3	39.0	42.3	46.2	41.38
Anxiety (8-32)	12.6	11.6	13.4	16.6	15.6	15.1	11.6	11.0	13.4	13.5	13.96
Emotional excitement (8-32)	16.8	14.5	20.2	23.9	21.8	21.1	17.7	18.3	20.3	21.8	18.31

**TABLE 9**  
**Changes in anxiety indices with boys (N= 50)**

	A (9)		B (13)		C (6)		D (9)		E (13)		Standard
	M1	M2	M1	M2	M1	M2	M1	M2	M1	M2	
Total scores (20-80)	37.1	34.8	41.6	39.4	47.0	42.0	39.0	32.6	37.2	36.1	39.21
Anxiety (8-32)	12.2	12.0	13.5	13.9	13.5	12.4	13.7	10.7	13.4	12.3	14.21
Emotional excitement (8-32)	17.1	14.6	19.6	17.1	24.3	19.6	17.0	14.7	15.5	16.3	17.08

*Explanation:*

A, B, C, D, E: the mean of the 5 classes taking part in the program  
M1: at the age of 10; M2: at the age of 14

Here too the direction and degree of the changes is decisive in the judgement, so it is purposeful to look over the summary of these too. (Table 10)

**TABLE 10**  
**Scores of decrease and increase in anxiety indexes on the basis of class means between 10-14 years of age**

	Girls (N= 64)			Boys (N= 50)		
	Total score	Anxiety	Emotional excitement	Total score	Anxiety	Emotional excitement
Class A	- 1.6	- 1.0	- 2.3	-2.3	-0.2	- 2.6
Class B	+6.8	+2.2	+3.7	-2.2	-0.4	- 2.5
Class C	+1.2	- 0.5	- 0.2	-5.0	-1.1	- 4.7
Class D	+0.7	- 0.6	+0.6	-0.6	-1.0	- 2.3
Class E	+3.9	- 0.1	+1.5	-1.1	-1.1	+0.8
Summarised change	+2.2	0.0	+0.65	-3.4	-0.76	-2.06

### *Conclusions*

1. With girls in the first measure 7, in the second measure 8 out of the possible 15 scores exceeded the standard. With boys 5 out of the possible 15 scores were higher than the standard in the first measure, while in the second only 3. This also shows some kind of a tendency.
2. With girls only 8 out of the 15 scores increased between the two measures, 7 decreased. With boys only 1 out of the possible 15 increased, the rest decreased between the two measures.
3. With girls the mean score of the changes in the 5 classes increased in case of the summarised score and emotional excitement, the anxiety index did not change. Boys scored lower in all three factors.
4. All this clearly indicates that the anxiety scores basically increased with girls during the program, while with boys they decreased.

### **4. Changes in extroversion**

We think that the pupils' extroversion also plays an important role in developing talent. An extrovert is sociable, enjoys socialising, has many friends, likes talking things over with others, is fond of sharing tasks, is willing to take risks, likes diversity, is open to the world (Eysenck & Eysenck, 1975). Of course, this type of personality can be changed and in our examination we monitored how successful our developing work in this field was during the program. We used the Hungarian version of *Eysenck's questionnaire* (Eysenck, Kálmánchey & Kozéki, 1981). Several factors of the personality are examined here, of which we were especially interested in extroversion. In the following let's consider how the scores changed. As there is a separate standard for girls and boys, we also give a separate summary of our results (Table 11: girls, Table 12: boys).

**TABLE 11**  
**Changes in extroversion with girls (N= 64)**

	A	B	C	D	E	Standard
M1 (max. 22)	13.2	15.1	13.6	12.6	15.1	14.9
M2 (max. 22)	17.2	15.2	14.5	16.5	14.2	14.9
Difference	+0.4	+0.1	+0.9	+3.9	-0.9	

**TABLE 12**  
**Changes in extroversion with boys (N= 50)**

	A	B	C	D	E	Standard
M1 (max. 22)	14.4	17.1	12.1	15.5	16.0	16.39
M2 (max. 22)	17.2	16.2	18.6	15.8	18.2	16.39
Difference	+2.8	-0.9	+6.4	+0.3	+2.2	

*Explanation:*

A, B, C, D, E: the mean of the 5 classes taking part in the program  
M1: at the age of 10; M2: at the age of 14

*Conclusions*

1. In the first measure with girls the mean of 3 classes was lower than that of the standard. There were 4 such classes with boys.
2. In the second measure with girls the scores of 2 classes remained under the mean. The result was the same with boys.
3. Both with boys and girls the scores increased in 4 classes – with varying intensity. In one class with both genders there was a slight decrease. The mean of increase was higher with boys (2.2 scores).
4. These results show basically favourable tendencies; however, the degree of the increase is uneven. In addition, there was no development at all. This also makes it necessary to enrich the program.

**IV. Summary**

Our measures focused on factors of the personality that are important for the abilities to develop, for talent to fulfil itself. The results show that it is necessary to monitor these components since no automatic favourable development can be expected. The main tendencies of development can be summed up as follows:

- Among the learning motives the affective-social and the moral motives developed to a lesser extent between 10-14 years of age in our program. This finding makes it necessary to enrich the forms of activity available to pupils as well as to increase the role of individual research.
- The unfavourable situation at the outset concerning success orientation and fear of failure did not change significantly: in several classes the dominance of fear of failure became stronger: this calls for a change in the teachers' methods of assessment. Also, the children's confidence and success orientation must be encouraged with more positive feedback.
- There is a significant difference in the anxiety indexes between the two genders: the scores increased with girls, while they decreased with boys. This finding indicated the importance of dealing with the two genders specifically, since anxiety indexes above the mean create unfavourable conditions in the development of abilities in the long run.
- Extroversion had a basically favourable course of development in the program, however, some unevenness can be seen in this field too. More attention from the teachers is needed to develop this factor too.

The above results illustrate only the main tendencies of how our development program affected personality. A continuous monitoring of the pupils who have joined the program recently provide further data for the development indexes, and the increase in the number of pupils allows for more differentiated statistical methods than before. The current relatively low number of pupils (114) prevented us from drawing conclusions of statistical significance. However, the points of reference obtained this way indicate the necessity of certain alterations in our talent development program.

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# A Follow-up Study of Pupils Having Taken Part in a Complex Talent Development Program

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## Introduction

For a long time experts have disputed the most fruitful method of developing talented children intensively. One camp has argued that this aim can be most effectively achieved within the normal school environment. The other side holds the view that separate schools for nurturing talents should be set up and high-ability students must be educated in these in order to speed up their progress.

For several reasons (which we do not wish to discuss here) we support the first view. We are convinced that the normal school environment can provide the best possibilities to develop a child's talents. At the same time it is also true that an intensive development of abilities has both its personal and material side and if either of these is missing the child will not be able to develop his abilities to the utmost (Freeman, 1991; Mönks & van Boxtel, 1985; Mönks & Peters, 1992; Trost, 1990; Dijk, Kok, & Poorthuis, 1991). Unfortunately, the conditions in schools for developing abilities intensively leave something to be desired in Hungary. What is more, even developing the basic skills present problems. The reasons for this include the lack of qualified teachers, lack of classrooms, the large number of children in one class, the lack of educational materials and equipment, just to mention the most important ones. In such conditions the abilities of a great number of children remain latent, and these valuable assets are lost to society.

Taking all this into consideration, if we want to save any of this potential it is necessary to collect the students who seem to be gifted and, by providing suitable conditions, to develop their abilities to the highest possible level. This was the motive that led the headmaster of the Bethlen Gábor Elementary School, Törökszentmiklós, to recruit a group of 7<sup>th</sup> form students from 14 elementary schools in the town and its surrounding area and launch an experiment to intensively develop the children's abilities in the 1987/88 school year.

The primary aim was an intensive development of the children's abilities through the use of the available pedagogical means. In addition to this general aim it was also our intention to prepare the 7<sup>th</sup> and 8<sup>th</sup> form students to achieve as best as possible in secondary school. Finally, we attempted to develop the chil-

dren's personality as well (e.g. self-knowledge, adjustment, morality, behaviour, etc), in accordance with the view that without a highly developed personality it is difficult to develop abilities.

In September 1988 an experimental class was started, and we reported the results of the project at the first and second ECHA Conferences. Our attention was focused on three questions:

- How is the development of a child's abilities affected if he is removed from his previous personal relationships?
- How does the new milieu affect the way the child's personality traits are formed?
- What group structure is formed in the experimental class, and does it provide an ample background for an intensive development of abilities?

Based on the results of our experiments our answers were as follows:

- Proficiency in the different subjects and IQ scores showed that the development of abilities with talented children is not retarded. On the contrary, it is speeded up if we take them out of their former surroundings and put them in conditions, which aim at developing them.
- The new situation and influences also effect changes in the children's personality traits. Some of these traits are undoubtedly positive while others are considered unfavourable. These mixed results emphasize why the development of personality traits should get more emphasis.
- A sociometric analysis demonstrated that an advantageous group-structure was created in the experimental class. It is characteristic of the class that its activity is directed by the tasks on the one hand and by an ambition to do better on the other.

The program and these results are described in detail in Balogh and Nagy (1990, 1991).

When these children left primary school we decided to monitor their progress, since only over a long term can we determine if our talent development program is beneficial. We now have two classes that have already left secondary school. In one of the classes there are 20 students who we could interview, and in the other class there are 18 such students. We would like to share these results and information with you.

### **Aims of the research**

Three general interests motivated our research. First, we were interested in school success, since one of the main points of our development program was to give a head start for later successful school achievement. To determine this we examined their grades in secondary school, as well as how many of them were able to get into colleges and universities.

The second interest is closely related to the first. We wanted to see how successful we were in developing their abilities according to their own interests and

inclinations. This could be reflected in the relative versatility or one-sidedness of their career choices. We developed a questionnaire to collect this information.

Third, we were also interested in some personality features. With the help of questionnaires we were studying the following features: competitiveness, empathy, and anxiety. We think that competitiveness is a very important aspect of the development and the success of talent. Empathy is another essential personality feature, because we consider it to be a major question whether someone has respect for others during his/her advancement or whether he wants to succeed without paying attention to other people. It is obvious how anxiety can destroy someone's achievement. Observing anxiety was of special importance to us since we could have made our students anxious with our tough requirements in the development program.

## **Results**

### **Progress in school studies**

As mentioned above, we wanted information in two areas. First, we monitored achievement in secondary school, and we compared their grades with the grades they had obtained during our development program. (Table 1)

**TABLE 1**  
**School achievement in primary school and secondary school**

	3.50-4.00	Primary school			Secondary school		
		4.01-4.50	4.51-5.00		3.50-4.00	4.01-4.50	4.51-5.00
Class 1	2	5	11		3	6	9
Class 2	4	2	14		4	3	13

As seen in Table 1, children who participated in the development program only slightly charged their achievement when going to secondary school. The excellent results remained. It is quite typical that students do not succeed in secondary school as well as they did in primary school. The results show that our program stabilized the abilities and personality features that play a significant role in learning.

Second, we looked at how many of these children could get to universities and colleges. (Table 2)

**TABLE 2**  
**Number of students in universities and colleges**

	University	College	No further studies
Class 1	6	8	4
Class 2	6	13	1

Table 2 also provides a positive picture of our children's achievement. How many students can get to universities and colleges is a more objective measure about school achievement. Here we can see that from experimental class 1 almost 80% continued with their studies, and in experimental class 2 all but one student continued. This is by far better than the Hungarian average. If we take a class in a primary school, typically only 2-4 children continue to study in universities or colleges. Of course this outcome is also influenced by their secondary school studies. But our experimental program at the end of their primary school studies must have played a significant role.

### **Characteristics of choosing a career**

It is a usual problem of Hungarian school programs that they try to focus on specialization at an early age (at the age of 9-10). One aspect of our development program was to help the children to find activities that are in line with their abilities and inclinations. We did not strive for one-sided and specific development. It is not by chance that the name of the program is still Complex Program for the Development of Giftedness. Table 3 shows what kinds of secondary schools they chose.

**TABLE 3**  
**Type of secondary school chosen by students**

	Class 1	Class 2
Comprehensive grammar school	5	5
Specialized grammar school	3	7
Technical secondary school	3	5
Accountant secondary school	3	2
Medical secondary school	1	1
Food industry secondary school	1	1
Art secondary school	1	1
Agricultural secondary school	1	1

Table 3 shows that there is a great variety even of secondary schools chosen by our children. They went to 8 types of secondary school. From schools having development programs children almost always go to grammar schools. This one-sided attitude did not exist among our children, although their intellectual capacities were beyond the average. So it seems that specialization according to abilities was successful in our program.

Table 4 summarizes the specialization of the chosen universities and colleges. The picture of higher education is even more varied, students chose 10 types. This is in line with the results of secondary school selection, and, of course the specialization of grammar schools also played an important role in this.

We also developed a questionnaire to inventory the children's general spheres of interests. The results are shown in Table 5.

**TABLE 4**  
**Specialization of universities and colleges chosen by students**

	Class 1	Class 2
Univ. of arts and sciences	2	4
Technological university	1	2
Univ. of economics	1	–
Music academy (univ.)	1	–
Univ. of horticulture	3	8
Teachers' training college	2	–
Teachers' training college (for junior classes)	1	2
Commercial college	–	3
Agricultural college	2	–

**TABLE 5**  
**Students' present general spheres of interests, shown with points**

	Class 1	Class 2
Manual, mechanical work	3.73	3.37
Scientific, speculative interests	3.06	4.04
Administrative, applied interests	4.20	3.80
Commercial interests	3.73	4.40
Visual arts	3.65	4.13
History, politics	3.93	9.30
Music	3.12	3.60
Pedagogy, education	3.40	4.13

These results again show that we developed many-sided interests with our complex program. The data indicate that the students had already developed many interests even before they got to universities and colleges. For them, the danger of tunnel vision does not exist.

### Personality features

We selected three personality features to be examined: competitiveness, empathy and anxiety. Competitiveness means that an individual takes a risk, looks for excitement and experience, is sensitive to boredom and is never reserved or shy (Kozéki & Eysenck, 1985; Eysenck, Easting, & Pearson, 1983). Empathy means sympathy, understanding others, being careful and interested in other people. Anxiety comes before action, it is an inner psychic tension, which destroys the efficiency of action if it exceeds the optimum level. All the three play a significant role in the development of giftedness, so it is not of secondary importance to what extent they characterize a student. The results of the competitiveness, empathy and the anxiety measures, calculated separately for girls and boys, are shown in Table 6.

The competitiveness measures are slightly above the average for both girls and boys. This shows that these students are responsive to new things.

The girls' empathy measures are only slightly below the average. But the high measures with boys show that they have a strong feeling for empathy. But all in all both sexes have a good level of empathy.

The anxiety measures show that our students are not extremely anxious, since the measures of both girls and boys are in the middle of the average standard. This fact is comforting for us because at the beginning of the program teachers and parents expressed concern that the children might develop a high level of anxiety in the competition of tough requirements. Fortunately, their concerns turned out to be false (Sipos, Sipos & Spielberger, 1988).

**TABLE 6**  
Means of personality measures of the sample, divided by sex (ample size in parentheses), and the means of standard population (range for anxiety measures)

	Girls (24)		Boys (14)	
	Mean	Standard	Mean	Standard
Competitiveness	15.2	14.11	17.6	17.44
Empathy	17.2	17.59	16.6	13.91
Anxiety				
General measure	39.4	30.6-50.4	40.8	30.6-47.1
Worry	13.8	10.4-17.4	14.6	10.5-17.4
Emotional excitement	17.2	13.7-22.7	17.0	12.5-21.3

## Summary

Our monitoring research gave favourable results of all the three main points of evaluation. The students in our development program had good achievements and results at entrance exams to universities and colleges, demonstrating that we established the proper development of their abilities at the age of 12-14. The wide variety of their career choices shows that our program was many-sided. They chose their careers according to their individual inclinations. We did not force anything on them, but helped them to find a career that suited their abilities. The results on the personality features indicate that their personality components also developed properly, and supported the development of the students' abilities.

Of course we are aware of the fact that secondary school teachers also contributed to these excellent results. Our main concern was to determine if our development program caused any trouble in the students' growth, or whether they had any problems, which might develop into unfavourable tendencies.

The results are comforting, and it is important to us because the *Complex Program for the Development of Giftedness*, in an improved version, will spread in Hungarian schools.

And finally, to prove that we really had a significant role in these results, let us quote what the students said about the values of this program after 4-5 years had passed.

- "I had a good basis for secondary school subjects."
- "The change from primary school to grammar school was easy."

- “I could study more easily in grammar school than my classmates.”
- “My general culture developed.”
- “It helped to choose a career.”
- “I learnt how to study.”
- “I got used to a regular and quick way of studying.”
- “It was good we had many-sided requirements, it helped me to develop my interests.”
- “I acquired a broader general culture.”
- “The afternoon sessions offered a lot of new experience and information. If I had come from a different primary school my results wouldn’t have been so good.”
- “I changed a lot as a person during these two years.”

Their opinions inspire us to go on more intensively with this program. And our monitoring research is not finished either. First, we want to continue monitoring these 38 students’ lives. Second, we are interested in the results of later classes as well. If we have a larger number of students, we will have more solid conclusions on which to base our work in the future.

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# The Relation between Intelligence and Mathematical Skills

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## Mathematical ability

### 1. The formation of mathematical skills

Similarly to other sciences, mathematics is also the result of the human mind: its most primitive forms could have been established when the human being had already possessed the necessary abstracting abilities.

The vital and psychological conditions of mathematical skills appear at the different stages of development, but the skills themselves can be structured by the activity in the fields of mathematics and the intensive relations with mathematics on the basis of these preconditions.

During phylogenetic development the ability of analysing and synthetizing developed gradually. At a certain stage of this process of evolution our ancestors discovered the tools that became the heritage of the community. They were some special techniques and operations in connection with quantities and the relations between them, or mathematics in embryonic stage. The tools preserved became a cumulative reality that went through permanent evolution and perfection. Mathematics, in permanent evolution, determines the more and more effective structuring of mathematical skills. The most influential factors in the development of those skills can be grouped in the following way:

- a) The level of mental functions (These mental functions depend on the inherited potentialities and the external conditions of the realisation of these potentialities.)
- b) The nature of contact between the children and mathematics, and the active character of this contact
- c) The methods employed in teaching mathematics
- d) The teacher's personality

Mathematical skills and especially their more developed forms appear rather late. Structuring is a long process, which is based on potentialities. Development is a long process and several factors may modify its course.

### 2. About the factor-analysis of mathematical ability

There are people who can easily learn mathematics while for others it is difficult and they have to do their utmost. Why is it that somebody is good at analysis but

fails in geometry and the other way round? How is it that you are good at managing a business but earlier failed in mathematics and a genius in mathematics is almost unable to carry out proper financial calculations? How can you explain that a certain exercise in an experiment (recorded among the interesting mathematical head-splitting tasks) could be solved by 45% of those asked and 87% of them were not directly linked to mathematics.

The answer can be given if we look at what *the analysis of cognitive skills* says about the nature of the mathematical way of thinking. The mathematical way of thinking may take as many different forms as many different tasks it approaches and as many fields of mathematics there are (i.e. arithmetic, analysis, geometry, topology, logic, etc). Moreover, considering their difficulty and structure, there is a great diversity in the tasks within the same field. However, one thing is true: no matter what kind of exercise it is, its analysis can contribute to the understanding of the mathematical way of thinking.

Factor-analytical researches in the 20<sup>th</sup> century, made it possible to construct the hierarchical system of cognitive skills (Vernon, 1961; Cattell, 1971; Cattell & Horn, 1978). After the integration and synthetisation of the results I managed to devise the short, previously introduced three-level model (without completeness). In this model the cognitive skills were classified. Three factors were distinguished which are the following ones: (1) *general*, (2) *broad*, and (3) *narrow*.

At the top of the hierarchy, that is the highest level, there is a general factor, which can still be found in each cognitive test, though its importance varies.

On the second level the so-called ‘overall’ skills can be found, which are relatively few in number. They are the following:

- fluid intelligence
- crystallised intelligence
- general memory and knowledge
- overall visual perception
- overall auditive perception
- overall information evocative power
- overall cognitive quickness
- processing speed

Factor-analytical investigations do not reveal much about the origin, durability of the factors or to what extent they remain unchanged during a lifetime. Most of the factors exist during the entire lifetime though the skills represented by them can either improve or regress in certain periods of life.

## **The examination of intelligence and mathematical skills**

### **1. The hypothesis**

“Mathematics can especially be used as an example of *B intelligence*<sup>1</sup> for two reasons. One of them is that learning mathematics shows quite many and obvious examples of the development of schemes, and as Vernon states, the complex of these schemes produces *B intelligence*.

The other reason can be that employing mathematics to solve the problems of sciences, industry and commerce has such a significance that it is one of the most important, or the most important means to understand and to form our physical world. If *B intelligence* is nothing more than ‘intelligence in action’, that is understanding our physical environment, we notify in advance and check then mathematics undoubtedly illustrates one of the most significant developments of *B intelligence*.” (Skemp, 1971)

In connection with cognitive skills there is a general factor in the mass of factors, the so-called “g” factor<sup>2</sup>. We may read much about the nature of “g” in many books, but the representation of this is not my present aim. Let us accept that in our whole life “g” influences our skill that helps us to solve mathematical tasks and to learn to solve mathematical tasks. Tests that measure the level of mathematical skills indicate a very close coherence between “g” and every other aspect of human development.

*Notes:*

<sup>1</sup> “B intelligence is the aggregate of schemes and spiritual activities occurred during such a great extent of interaction between individuals and their surroundings to which extent its organic equipment enables it.” (Vernon, 1969)

<sup>2</sup> The first representative of the factor-theory was C. Spearman, who formulated his so-called two-factor model. In this he made the difference between the general “g” factor to be found in the solution of every intellectual exercise and the specific “s” factor that is typical of the various factors.

The purpose of my investigation was the comparison of students’ mathematical skills and the results of intelligence tests. I expected that students having outstanding results on intelligence tests would have good results on tests measuring mathematical skills, and results below average on intelligence tests would show in the results of the test measuring mathematical abilities. The above mentioned hypothesis seemed to be supported by the supposition saying “*the tests of intelligence correlate with mathematical skills mostly, and it is especially reflected in the actions requiring a non-verbal, spatial way of thinking*” (Gyarmathy, 1999).

Secondly, my aim was to find those components that are relevant to mathematical skills and to find a method to measure these skills.

## 2. Significant skills supposedly relevant to the mathematical way of thinking

It may be presumed that there are no skills that can explicitly be called mathematical ones. However, in the following I am going to introduce two factors my investigation considered, which may be important from the point of view of mathematical thinking.

### *Fluid intelligence*

Fluid intelligence means a general ability in connection with such tasks that include induction, a deduction-conclusion-like way of thinking and a quantitative way of thinking. It closely correlates with “g” and, according to some specialists, it is identical with fluid intelligence.

Factors within fluid intelligence seem to hold significance from the point of

view of mathematical thinking. Authorities dealing with mathematics (Nesher & Kilpatrick 1990) pointed out that the solution of mathematical problems often includes the processes of induction, deduction and mathematics separately.

For examining the inductive thinking factor the most frequently used test is Raven's Advanced Progressive Matrices (1962). The first version of the APM was made in 1943 and its first modification happened in 1947. The main purpose of this modification was to make a more general use possible by extending it to measuring non-verbal intellectual effectiveness. Intellectual effectiveness measures the extent to which the person in question can make comparisons among different diagrams and can think in a logical way. The advantage of APM compared to verbal tests is that it can measure the individual's way of thinking independently of the effects of teaching and instructions.

First of all, the subjects had to fill in Raven's APM-test. In the test subjects are expected to recognise the organising principle in two series or samples and to fill in blank spaces considering the principles. The right solution requires grabbing the regularity of the sample, recognising the organising principle and the consideration of units as possible members of the series. The task demands the implementation of complex logical operations. The terms of recognising connections and principles require the clear perception of the tasks and that the subject should be able to envisage the perceived connections and to perform sound reasoning.

In tests measuring the inductive way of thinking subjects examine different items and try to generate some hypotheses and then test them. Number series often constitute such items. E.g.:

4      8      6      —      10      —      18      36      —

To solve this task the subject should discover the rule this number series is built on.

In the first sub-test in our experiment they had to recognise the correlation among the members of series. In this way we wanted to measure logical deductive skills, which, together with a highly developed abstraction ability, cogitation of a functional nature and the ability to formulate conclusions as well as a high level of concentration help the subject solve such test items.

*The quantitative way of thinking* requires the knowledge of mathematical relations and characteristics. This is one of the skills that can be called exclusively mathematical. Tests measuring this skill are called arithmetic, they look at the arithmetic way of thinking or mathematical natural endowments. Usually they include various mathematical problems, for example textual assignments, number series and problems that need the selection of suitable arithmetic operations, and they do not require many calculations. Generally there is a time limit so that scores mainly depend on how difficult the items are.

The second sub-test contained simple arithmetic operations in the form of tasks with text. We can draw the conclusion that, similarly to other sciences, mathematics is also the creation of the human being and could appear when the human being was able to abstract. This test measured the arithmetic ability, how-

ever, it could not be reduced to examining arithmetic effectiveness. It also served the examination of problem solving, which required the knowledge of mathematical characteristics and relations.

Both sub-tests highlight the speciality of mathematical abilities, which shows the extent the person is capable of spanning and being the master operatively, and also of carrying out various operations simultaneously or step by step with these pieces of information, which, in fact constitute the chain of deductions.

In the case of all the three tests I had limited time-periods and it appeared as the factor of cogitation quickness.

Fluid intelligence also has a factor, which can be identified with the speed of thinking and in tests we examine what the quickness of solving cogitation problems during a given time is. Between the level of capabilities and quickness there, undoubtedly, is a correlation, which means that people of high level cogitation capabilities are quicker in tackling mathematical operations than people of low level cogitation capabilities, though this correlation is far from being perfectly examined. It follows from this that cogitation tests to be tackled within a given period of time do not measure people's problem-solving capacity as reliably as those do where there is no time limit.

### 3. The sample

The study took place at the Faculty of Agricultural Sciences of the University of Agriculture in Debrecen (now the Faculty of Agricultural Sciences of the University of Debrecen). I presumed that students studying general agricultural engineering have better capacities in mathematics than the average. This presumption was based on the special feature of the syllabus, which puts emphasis on the teaching of mathematics in a foundation phase, thus it can be assumed that students acquire genuine mathematical knowledge. Within the framework of the syllabus several other subjects are based on mathematics as well. The survey took place in December 1998, including 200 students. The sample was divided into fourteen groups, which corresponded to the groups they belonged to at the university. The gender ratio was proportional in each group.

### 4. Summary of results

The results of the 'test of number series' were the following. Table 1 contains the number of persons belonging to each category.

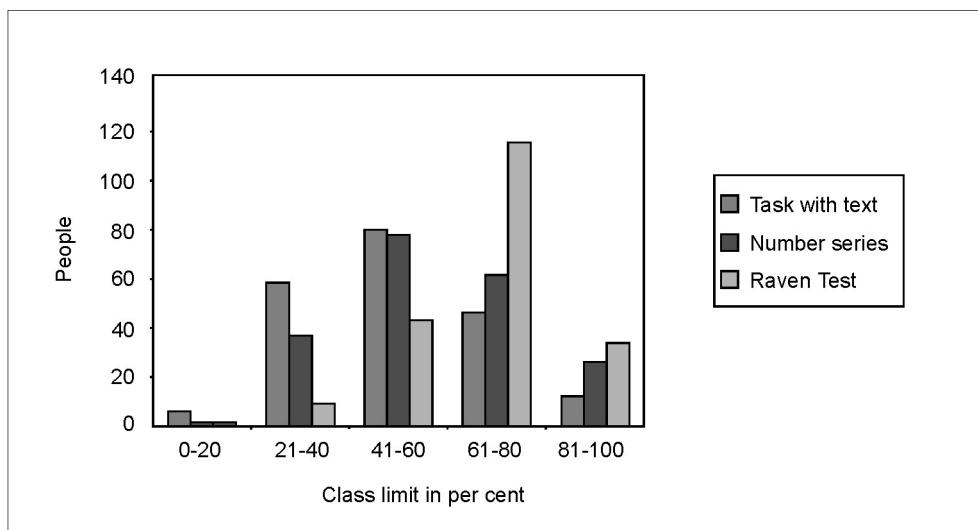
TABLE 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Weak	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Below average	13	4	1	2	3	4	3	2	0	3	1	0	1	0
Average	6	8	6	3	5	9	6	8	1	8	5	2	8	2
Above average	0	3	0	6	6	3	0	6	10	3	2	9	6	7
Outstanding	0	0	4	3	3	0	0	3	5	0	2	0	2	4

Altogether, we can say that the fewest people belong to the two extreme categories, there is one person of weak capacities and twenty-six of excellent capacities. The average category includes most of the sample and those performing above the average are more than those performing below the average are. The results follow the natural distribution.

In the case of the task with text we can draw similar conclusions: the rate is the lowest for the two extreme categories while the 41-60% interval includes most of the sample. It is interesting that people performing below average are less in number than those performing above average.

The following diagram contains frequency distributions for the whole sample.



The results of Raven's test were the most surprising considering what my hypothesis was based on. I expected similar results to those of the tests measuring mathematical capabilities but in this case it was the fourth category (61-80%) that included most of the sample, which is the best result in the study.

Naturally, in each study there are many factors that can significantly influence the given results. Intellectual effectiveness also depends on the individual's physical, mental abilities and health condition. If someone is familiar with the situation and is at home while filling in a given test he/she is probably more effective and can get better results. In such cases the results cannot be considered to be valid and are impossible to predict. We should also take motivation into account since the lack of it can lead to non-valid and non-representative results.

The results acquired, however, were contradictory to what I had expected. Nevertheless, they called my attention to an interesting phenomenon. On the basis of the previously mentioned factors, the results of the intelligence tests were better than the results of the tests measuring mathematical skills though they are still

below the average. The results of the mathematical tasks were also worse than I had expected. When looking at the results, however, we should not forget that these students are doing a special university course in Hungary, in that it is one of the few where there is no entrance examination, where students are admitted on the basis of their score from secondary school. Regarding the results of the study, as a teacher, with four years of teaching experience, I can state that this is probably reflected in the level of the students' knowledge as well. It would be interesting to administer these tests to a group with similar background but whose members were admitted to university after a successful entrance examination.

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# The Development of Problem Solving and its Relationship with Other Influential Factors

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In our time it is expected of both highly gifted and ordinary people to be able to recognize and solve problems. Gagné (1985) unambiguously points out that intellectual capacity, including problem solving, is an integral part of the general ability of giftedness. Problem solving is catalysed by motivation and the family.

According to Robert Fisher (1987) there are three important correlating factors, which affect problem solving:

- Attitude: interest, motivation, self-confidence
- Cognitive skills: knowledge, memory, thinking ability
- Experience: knowledge of content, connections, problem solving strategies, background.

Problem solving is the highest level of learning, whose psychological procedure has been examined all over the world. According to László Balogh (1998) independent learning and the skill for solving problems can only be developed if we steadily make our students practise all the procedures of problem solving. In consequence, we must aim at the proper conditioning of the operational activity and at improving the flexibility of knowledge. According to Skinner, (1973) the way leading to the solution should only be shown to those who are not able to find it by themselves.

I believe that problem solving abilities can successfully be developed through teaching and learning mathematics and sciences. Being a teacher of biology, I can see excellent possibilities in my subject to show my students how to use their acquired knowledge to solve ordinary problems. In Hungary, however, children are expected to acquire such a huge amount of factual knowledge that there is simply no room for regular and systematic problem solving activities.

There is an additional problem. It is the apparent lack of motivation on the students' part, which, however, derives from the workload they are expected to cope with. The third problematic area is the students' unsatisfactory learning strategy.

The starting points of my experiments follow from the above:

1. What connection is there between problem solving motivation and learning strategies?
2. How is the development of problem solving activities influenced by the operation of the family?
3. How does the regular and systematic application of the problem solving strategy in the procedure of acquiring knowledge affect the development of interest?

The goal of the experiment was to help the students gain insight with the help of a workbook, which was based on *the way to problem solving* (from the problem through hypotheses and experience to the test of the hypotheses). It invited the students to solve and make up problematic exercises regularly.

The experiment included 302 students aged 14-16 in three secondary schools of Debrecen. 98 of them comprised the control group.

A questionnaire was chosen as a method of the examination. For the measurement of intelligence the Raven Test, for the measurement of learning strategy the Kozéki-Entwistle Test, and for the measurement of family background Mánya's Family Image Test were applied. In order to examine problem solving abilities, a biology test was used.

We made sure that traditional and modern teaching methods were equally included so that the students should not get bored with monotonous work. The test contained several interesting, exciting and varied exercises, which required creative and abstract thinking. It applied the research, project and mind-map methods. Students were expected to work on their own, in groups, without the assistance of the teacher. The application of traditional and modern teaching methodologies makes it easier to spot and develop the gifted. In this way, the gifted students make much use of their own imagination and abilities at lessons. We have the results of the first examinations, which we would like to share with you. The final results will follow later, after the experiment and the second survey.

## **Results and conclusion of the general survey in 1998**

**TABLE 1**  
**Summary of the results of learning motivation, learning strategies, problem solving thinking and family image testing**

Factors	Minimum	Maximum	Mean	Standard deviation
Emotional warmth	8.00	30.00	24.72	4.08
Identification	10.00	30.00	20.03	3.89
Affiliation	13.00	30.00	23.57	3.39
Independence	10.00	29.00	21.31	3.41
Competence	9.00	30.00	20.88	3.94
Interest	10.00	29.00	20.06	4.05
Conscience	11.00	37.00	23.89	3.59
Need for order	11.00	30.00	22.65	3.78
Responsibility	9.00	30.00	23.47	3.82
Feeling of pressure	7.00	30.00	17.29	4.57
Affective	39.00	88.00	68.32	8.44
Cognitive	29.00	87.00	61.88	8.63
Moral	47.00	93.00	69.75	8.87
Problem solving	3.00	27.00	13.69	4.94
Authority	10.00	45.00	33.05	5.86
Cohesion	8.00	33.00	19.15	5.06
Adaptation	12.00	50.00	35.88	6.97
Meaning-seeking	10.00	87.00	63.13	10.45
Reproducing	8.00	82.00	59.85	9.94
Organizing	5.00	82.00	60.28	10.41

### 1. Learning motivation

**TABLE 2**  
**The order of factors in learning motivation based on Kozéki & Entwistle Test**

Order	Revak's data aged 15 in 1998	Dávid's data (in 1997-1998) aged 12	Dávid's data (in 1997-1998) aged 14
1.	Emotional warmth	Emotional warmth	Emotional warmth
2.	Conscience	Conscience	Affiliation
3.	Affiliation	Responsibility	Responsibility
4.	Responsibility	Need for order	Conscience
5.	Need for Order	Affiliation	Independence
6.	Independence	Identification	Need for order
7.	Competence	Competence	Competence
8.	Interest	Interest	Interest
9.	Identification	Independence	Identification
10.	Feeling of pressure	Feeling of pressure	Feeling of pressure

If we compare the means for 15-year-olds in 1998 with those David found in 1997, we can see that they show a downward tendency, but students in his sample were younger. This tendency may also be due to the characteristics of the age group as well as the fact that 15-year-olds go to secondary and not primary school. Unfortunately, the downward tendency further strengthens in secondary school, which may be the consequence of some other influential factors. (Requirements, the lack of proper teaching-learning methods and the characteristics of the age group, some socio-economic conditions etc.).

As far as the different factors are concerned, care and emotional warmth seem to be the most important ones for school achievement and the development of abilities in every age group in school and in family as well.

Conscience, confidence, assessment needs, self-image are important, too, but affiliation and responsibility are ahead of them at the age of 14 because of a characteristic of the age group to 'live only for the group within the group'. (The group that consists of the nicest and most accepted friends of their own.)

It is interesting that responsibility comes after affiliation at the age of 14 and 15 but conscience is ahead of either responsibility or affiliation for 15-year-olds. A possible explanation seems to be that students go on to secondary school and they may want to fulfil the new requirements in an environment, where they do not yet feel they belong. Affiliation is not the most important factor in the motivation of 12-year-olds because of the characteristics of the age group.

The position of interest in every age group should be more carefully examined because it seems to lag behind other factors and does not seem to get into a higher position with time either, which may constitute a major disadvantage in the development of students' abilities. On the other hand, it may be the consequence of the traditional, domineering attitude, which was expected of teachers in the Hungarian educational system. This factor may play an extremely important role in the development of gifted and average children alike, so it is our plan to look into the problem more closely in a future study.

Independence and the sense of acceptance (especially the teachers' positive regard) are dominant in junior section but they seem to lose some of their importance later on, which may be due to the development of abstract thought.

In this order, the last one is the feeling of pressure, because it is the most negative factor in motivation towards studying. But I do not feel that we should blame the teachers for this fact. Maybe it would be a good idea to reconsider the huge requirements of the national curriculum.

**TABLE 3**  
**Correlation between the dimensions of learning motivation**

M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>
M <sub>1</sub>									
M <sub>2</sub>	.343**								
M <sub>3</sub>	.336**	.294**							
M <sub>4</sub>	.284**	.156*	.112						
M <sub>5</sub>	.216**	.336**	.349**	.187**					
M <sub>6</sub>	.220**	.383**	.193**	.175*	.460**				
M <sub>7</sub>	.423**	.291**	.299**	.167*	.255**	.301**			
M <sub>8</sub>	.276**	.498**	.332**	.223**	.547**	.445**	.424**		
M <sub>9</sub>	.276**	.166**	.169*	.169*	.216**	.113	.445**	.290**	
M <sub>10</sub>	-.362**	-.147*	-.236**	-.199**	.218**	.069	-.192**	-.155*	-.218**

[Explanation: M<sub>1</sub>: Emotional warmth; M<sub>2</sub>: Identification; M<sub>3</sub>: Affiliation; M<sub>4</sub>: Independence; M<sub>5</sub>: Competence; M<sub>6</sub>: Interest; M<sub>7</sub>: Conscience; M<sub>8</sub>: Need for order; M<sub>9</sub>: Responsibility; M<sub>10</sub>: Feeling of pressure; \*: signification 0,05 level (2-tailed); \*\*: signification 0,01 level (2-tailed)].

Emotional warmth correlates with all the factors of learning motivation significantly on 0,01 level, except for the feeling of pressure. So it is a dominant factor in studying and in the development of abilities.

Care and emotional warmth show the highest correlation with conscience (0.423\*\*) (Table 3). Confidence, the need for order and self-esteem usually get stronger in a favourable milieu. Emotional warmth is connected with interest, too (0.220\*\*) (Table 3).

Because interest is an important and influential factor in problem solving, we can see that emotional warmth has a positive influence on problem solving, too.

The correlation between identification and emotional warmth needs is 0.498\*\* (Table 3). In consequence, the teachers' acceptance of their students affects how well the pupils can adapt, fulfil their potential and whether they can do everything in order to develop their thinking.

Let me call your attention to the correlation between affiliation and competence (0.349\*\*) (Table 3) and affiliation and the need for order (0.332\*\*) (Table 3), which reflect a typical characteristic of the age group in my experiment.

Consequently, I firmly believe that working and learning in groups make it possible for young people between 14 and 18 to develop their problem solving thinking. It is small wonder, because interest at 15 is affected by belonging to peer groups. Equally, how one fulfils one's potential depends on the opinion of friends to a great extent at this age.

The correlation between independence and fulfilling one's potential suggests that if we want to enhance the sense of responsibility of 15-year-olds we should allow them to indulge in their creative and useful imagination and thinking.

The correlation between competition and interest is fairly high (0.460\*\*) (Table 3) and it further emphasises the importance of working together in a group in secondary school. One of the highest correlation in this study is between competence and the need for order (0.547\*\*) (Table 3). That is, the stronger a student's desire for studying is, the more he is willing to accept the obligations for the sake of the cause. So, the leniency and the lax discipline paired with the traditional teacher centered methods in schools today does not seem favourable to the development of creative thinking. The acceptance of order in school does not mean the acceptance of speechlessness and having to sit with one's hands behind but the organization and the structure of the process of knowledge acquisition, the responsibility for group work and the persistence in acquiring knowledge.

Because of the correlations between interest and the need for order, enjoyable group activities should constitute powerful factors in learning. Working in groups, students are expected to take responsibility and keep to the group norms. The correlation between conscience and the need for order (0.424\*\*) and conscience and responsibility (0.445\*\*) (Table 3) show that the students in this age group are ready to fulfil their potential in fields of their own choice. A clear picture of their assets and realistic self-knowledge are extremely important at this age. In forming the above they consider the assessment of their teachers, friends and parents, which sometimes does not correspond to their own opinion of themselves. We should realise the role teachers' reactions play in the development of the individual and it is time experts in education took every effort to make teachers aware of the fact. It is our responsibility to give them every help to practise objective, impartial assessment. The feeling of pressure shows negative correlations in all cases, which is also of importance. These data demonstrate the fact that the present, unfavourable social milieu, where there is not much understanding, probably has a negative influence on the development of abilities. What is more, teachers sometimes want to make students do their best because they feel that their students' achievement proves their own abilities.

We should pay more attention to this fact, which might be highly detrimental in a system, where both teachers and students are already overburdened. In all probability, it would be easier to pay more attention to the development of abilities if the requirements were eased.

## **2. Learning strategies**

**TABLE 4**  
**Results of learning strategies testing**

Learning strategies	Means in Hungary aged 15 in 1998	Means in Hungary aged 14 in 1996	Kozéki's means in 1986 in Hungary
Meaning-seeking	63.13	51.98	50.79
Reproducing	59.85	45.88	45.49
Organizing	60.28	42.78	40.98

Both means in Hungary for 14-year-olds and those of Kozéki's are lower than those for 15-year-olds in 1998 (Table 4). This fact can be explained with one of the characteristics of the age group, which is that abstract thinking, understanding and the seeking of connections are on a higher level in this age group. However, it is interesting that the difference between means of organizing for 15-year-olds and those for 14-year-olds is higher than the difference between the means of meaning-seeking for the two age-groups. (Table 4). It may be due to the fact that students of 15 are less interested in learning (meaning-seeking-interest correlation: 0.162\*).

On the other hand, secondary school students of 14-15 wish to meet the requirements above all, which is desirable for them and the school alike, and which, in turn, is more in favour of organizing than meaning-seeking.

Probably, the role of meaning-seeking will increase at the age of 17-18.

Even reproduction develops more intensively than meaning-seeking, because of the above mentioned strong wish to meet the requirements in order to secure good positions in secondary school. I think meaning-seeking is one of the most important factors for the development of both thinking and problem solving. Contrary to this hypothesis, problem solving correlates with meaning-seeking on a rather lower level (0.090). This is a positive correlation but higher than the correlation between problem solving, organizing and reproducing. It shows that meaning-seeking affects problem solving but it is not the primary factor in the development of thinking.

The correlation between meaning-seeking and interest is significant (0.162\*) but students of 15 do not show a high level of interest. It would probably be a good idea to do our best to raise the level of children's interest, as a result of which the learning process would become more effective. The fact that problem solving thinking is one of the indirect ways to develop meaning-seeking should not be forgotten. If we develop meaning-seeking directly, problem solving develops automatically and positively.

### **3. Social background: Family image and function and its relationship with problem solving**

I presume, the way the children's families function may affect the development of problem solving thinking. I suppose that a balanced, democratic family that establishes some limits is favourable to thinking. A family like this allows independence, there is cohesion between its members and a system of tasks and roles that suits its structure.

It is such an adaptive, democratic, conscious and organized milieu that allows children to solve their own problems. Judit Mányai's questionnaire on family image consists of three subscales (authority, cohesion, and adaptation). It was adaptation that showed the highest mean. I think we should be pleased with this result bearing the correlation between adaptation and problem solving in mind (0.031). It is neither significant nor too high but it is more positive than the relationship between authority–problem solving (-0.064) or cohesion–problem solving (-0.178\*). My assumption seems to have been proved.

I firmly believe that one of the most important duties of psychologists and teachers is to make parents realise the importance of positive relationships and to advise them on the role of the adaptive family.

There is ample evidence proving that childrens' cognitive development is negatively affected in a family which is about to break up and where the members of the family live separately and independently of one another.

A democratic but unorganized and too permissive family milieu is equally unfavourable. In consequence, although correlations show that families do not constitute the primary factor in the development of problem solving, they should be taken into account without the shadow of a doubt.

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# **Learning Techniques and Self-knowledge with Talented Schoolchildren**

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On the first and second conference of ECHA we reported that we had been working using a special talent development program in Hungary since 1987 (Törökszentmiklós, Reformed Elementary School) with children of age 13-14 (Balogh & Nagy, 1990, 1991). On that conference we summarized our experiences of the program and the developing effect of it. Now we will not talk about this but we would like to mention the problems raised from that time and our endeavours at solving them.

In the course of our work first the everyday experience then the inquiries also proved that the development of talented pupils participating in our program was retarded by the lack of effective learning methods and by the lack of real self-knowledge. For this reason we collected a special program for direct development of these two important factors. In our lecture we will report on this program according to the following sections:

- aim of the program and the main content elements of it;
- presentation of the results of the examination and the analysis of them;
- conclusions useful for further talent development work.

By way of introduction we would like to talk about the reasons why these two elements i.e. development of learning methods and self-knowledge seemingly far from each other could combine. The explanation is obvious: both of the two factors play a significant role in development of the talent of children as it was proven by several researches before. As these two factors got into the program at the same time, it made possible to investigate certain relations as well.

## Aim of the programs, principal content elements

### 1. Program of development of learning methods

The aim of this program was to make learning methods and strategies of pupils effective. Two channels presented themselves for it: a direct and an indirect.

The essence of direct development is making the children train such learning methods which are missing from their learning methods. In this case there is an opportunity to introduce the new methods into the learning activity and knowledge treatment (Schmeck, 1988; Twining, 1991).

The essence of indirect development is developing those intellectual capacities directly, which make possible the shaping of more effective learning strategies. A problem emerging many times is that those intellectual capacities are missing from the pupils which are the conditions of the more intensive – profound – learning techniques (Gross, 1991; Lapp, 1995).

Both of the elements got a role in our program. For direct development we used a lot of deep methods.

- Definition of an unknown word. (On the basis of context analysis and context disintegration. Turning over the pages back to a chapter learned before. Using dictionaries, encyclopedias and reference books.)
- Paraphrasing: rephrasing some sentences and passages, telling them by own words.
- Transcribing and defining key concepts.
- Searching for relations between concepts and fixing them in memory. (Associative concepts groupable around an important concept. Relations of subordinations and superordinations. Connections of co-ordinations. Contrasted concepts. Relations of causes and effects.)
- Survey. (Preliminary survey: the title, subtitles, main paragraphs, short summaries of parts of chapters. Subsequent survey: survey of underlinings, comparison with sketches or with own notes.)
- Summing up in words or in writing.
- Studying and explanation of sketches, figures and diagrams etc.)
- Asking questions regarding the subject. (There must be understanding behind a good question!)
- Talking with classmates about the information learned.

In the course of indirect development we aimed at the following elements of intellectual capacities:

- Elements of function of attention. (Extent, durability, distribution, transference.)
- Mechanism of understanding thinking. (Concept formation, revelation if connections, recognition of phenomena and ranging of them.)
- Mnemotechnic methods. (Coding mechanisms.)
- Components of problem solving thinking. (Understanding of exercises, phases of thinking and actions of thinking.)

Of course direct and indirect developments are not separated sharply in practice but the individual points of view get a dominant role in some exercises. We worked out a 30-hour program for the development.

## **2. Program of development of self-knowledge**

The aims of this program were development of self-knowledge, self-image and social image. The following main points of view were enforced in the development and the inquiry.

- Self-evaluation appearing in different situations. (Situations of accomplishment, social situations, ethical standpoint.)
- Relation of self-image and social image of classmates.
- Comparison of self-image and social image of the pedagogue.
- Alteration of inclination to empathy.

The program consisting of ten meetings took place in subsequent weeks. Each of the meetings was two hours long. On the first and on the last occasion questionnaires were filled in by the pupils regarding their own self-image and regarding what – according to them – some important persons (father, mother teacher, classmates) thought of them. Classmates expressed their opinions about each other as well.

Briefly about the group processes. The organization and starting of the group took place in accordance with the group leading practice applied in Hungary: outlining the expectations, discussion of group rules and acceptance of group rules. The main elements of the group process were formed by the encounter games of Rogers and verbal games. A number of the first meetings concentrated on the introduction of the group as a whole. Parallel knowledge of the individuals and the group took place. Regarding that the children were at the beginning of adolescence, we paid special attention to bringing it to the surface and to discussion of opinions of boys and girls formed of each other. We did it also in a form of a game. The emotional peak of the whole group process was a game that is known by the name of “Hot Chair” in Hungary. The children set down alternately, one by one on the chair that was in the middle of the circle. Every classmate went to the child sitting on the chair: “My opinion of you is the following...” According to the opinions written by the children subsequently this game was the hardest but also the most exciting and meaningful for them.

## **Presentation and analysis of results of the inquiry**

### **1. Results of development of learning techniques**

Altogether 78 pupils divided into four groups participated in the two developing programs. To test the effectiveness of the programs we performed measurements before the series of the group meetings and after as well.

We examined the elements of learning methods, which elements play a significant role directly or indirectly at processing and storing the knowledge. We have already outlined these elements and now let us see the results (Table 1).

**TABLE 1**  
**Results of development of learning techniques**

	1 <sup>st</sup> measurement (%)	2 <sup>nd</sup> measurement (%)	Difference (%)
Understanding thinking			
Emphasizing the essence	51.6	60.9	9.3
Concept classification	46.4	60.2	13.8
Searching for main concept	55.9	63.9	8.0
Mnemotechnics			
Remembrance of text	67.0	87.7	20.7
Remembrance of form	70.7	83.5	12.8
Functioning of attention	67.7	84.8	17.1

### *Conclusions*

1. Pupils participating in the program are talented regarding their general intellectual capacities, they have high scores of IQ (we talk about it later in details), but it does not mean automatically that they have developed learning strategies. Results of the first measurement show this conclusion.
2. The developing program lasted 15 weeks and this period brought a significant development. It is proven by the differences of the two measurements.
3. Nevertheless, regarding the elements of the learning methods we can find significant differences in development.
  - The most intensive development was observable at remembrance of text. Not only the methods used in the program played a great part in it but surely also the fact that the pupils could exercise such methods in their everyday learning as well. Remembrance of form is more infrequent at schools.
  - It is shown by the results that methods of functioning of attention can be developed rapidly. This is an important fact since poor attention is a frequent obstacle in successful work and in talent development.
  - Elements ensuring the understanding of learning developed the least as it was expected. On one hand the reason for it is that understanding thinking has several components and such components get connected more slowly. On the other hand understanding is never independent of acquired experiences and learned knowledge and these elements are built and grow richer also slowly. The functioning of memory and attention are bounded more to the situation given and these learned methods can come into full display more distinctly in this way.

## 2. Connection of learning methods to intelligence and school achievement

As we indicated before we performed inquiries regarding not only the learning methods but we wanted to disclose the connection of learning methods to other factors as well. Such factors are intelligence and school achievement. What do the correlation calculations show? (Table 2)

**TABLE 2**  
**Connection of learning methods to intelligence and school achievement**

	LM	DLM	VQ	PQ	IQ	SchA
LM	1.0000 <sup>b</sup>	.0034	.1793	.1699	.2353	.2568
DLM	.0034	1.0000 <sup>b</sup>	-.1796	-.0583	-.1545	.2664 <sup>a</sup>
VQ	.1793	-.1796	1.0000 <sup>b</sup>	.0678	.6670 <sup>b</sup>	.1106
PQ	.1699	-.0583	.0678	1.0000 <sup>b</sup>	.7871 <sup>b</sup>	.1408
IQ	.2353	-.1545	.6670 <sup>b</sup>	.7871 <sup>b</sup>	1.0000 <sup>b</sup>	.1853
SchA	.2568	.2664 <sup>a</sup>	.1106	.1408	.1853	1.0000 <sup>a</sup>

Number of cases: 78

1-tailed signif: <sup>a</sup> -.01; <sup>b</sup> -.001

(LM: Learning methods, DLM: Development of learning methods, VQ: Verbal intelligence, PQ: Practical intelligence, IQ: Intelligence-quotient, SchA: School Achievement)

### Conclusions

1. Although there is no significant connection between learning methods and school achievement the values show that learning methods play an important role in effectiveness of learning, thus the development of learning methods are essential for the talented children as well.
2. On the other hand the development of learning methods and school achievement are in significant positive correlation. In the background of this fact there must be that children learning better are more receptive to the new learning method according to the requirements and this is one of the reasons why they can perform better.
3. There is not significant correlation between learning methods and scores of intelligence. Thus high level of intelligence does not run automatically together with developed learning methods. That is reasonable ground for believing that special development of learning methods is important even talented children.
4. Although just a low degree but negative correlation is observable between development appearing in learning techniques and scores of intelligence. In the background of this fact there must be the reason that the lower the intelligence is, the more new things are given by a developing program for a pupil. This can also be a general problem and not only the problem of talented pupils.

Comparison of boys and girls. Values of correlation (Table 3 and Table 4).

**TABLE 3****Boys**

	LM	DLM	VQ	PQ	IQ	SchA
LM	1.0000 <sup>b</sup>	-.2077	.2335	.1755	.2846	-.1192
DLM	-.2077	1.0000 <sup>b</sup>	-.2394	-.0098	-.1648	.2496
VQ	.2335	-.2394	1.0000 <sup>b</sup>	-.0905	.5584 <sup>b</sup>	-.0484
PQ	.1755	-.0098	-.0905	1.0000 <sup>b</sup>	.7740 <sup>b</sup>	.0536
IQ	.2846	-.1648	.5584 <sup>b</sup>	.7740 <sup>b</sup>	1.0000 <sup>b</sup>	.0300
SchA	.1192	.2496 <sup>a</sup>	.0484	.0536	.0300	1.0000 <sup>b</sup>

Number of cases: 34

1-tailed signif: <sup>a</sup> -.01; <sup>b</sup> -.001**TABLE 4****Girls**

	LM	DLM	VQ	PQ	IQ	SchA
LM	1.0000 <sup>b</sup>	.2262	.1386	.1636	.2011	.6110 <sup>b</sup>
DLM	.2262	1.0000 <sup>b</sup>	-.1573	-.1144	-.1691	.2915
VQ	.1386	-.1573	1.0000 <sup>b</sup>	.1881	.7118 <sup>b</sup>	.3040
PQ	.1636	-.1144	.1881	1.0000 <sup>b</sup>	.8199 <sup>b</sup>	.2318
IQ	.2011	-.1691	.7148 <sup>b</sup>	.8199 <sup>b</sup>	1.0000 <sup>b</sup>	.3512 <sup>a</sup>
SchA	.6110 <sup>b</sup>	.2915	.3040	.2318	.3512	1.0000 <sup>b</sup>

Number of cases: 44

1-tailed signif: <sup>a</sup> -.01; <sup>b</sup> -.001

### *Conclusions*

1. The former (2), (3) and (4) conclusions are valid both for boys and girls. In this respect there is not any difference between them.
2. Nevertheless connection between learning methods and school achievement is significantly different in the two sexes. There is a negative value with the boys and a significantly positive correlation with the girls. The background of this fact may be that girls learn systematically day by day so learning methods being in their possession are profitable also for school achievement.
3. There is a significantly positive connection between school achievement and intelligence in case of girls but there is no such connection observable in case of boys. The reason for it can be found certainly in point (2).

### **3. Results of development of self-knowledge**

The framework created by the self-knowledge group made it possible for us to investigate the opinion of children of themselves, using questionnaires adequate to their age.

We got also a picture of the children, namely they told us what some persons they consider important in their environment think of the children.

The essence of the questionnaire is as follows:

Twelve characteristics were listed on the paper, for example cleverness, beauty, independence, sincerity, power of will, diligence etc.

*Instruction: Please, evaluate yourself according to the following characteristics! Think of your form-master's opinion, what he (she) would do if he (she) expressed his (her) opinion of you in scores according to these points of view. Seven points would go to such a person of whom that feature is very characteristic. One point would go to a person of whom that feature is the least characteristic. Four points mean the average.*

Thereafter each of the children filled in also the other columns of the questionnaire according to what they think the opinion of their father, mother and classmates is. Finally every child evaluated himself or herself.

We could compare the self-image and the supposed image of classmates with the real opinion of the classmates; every member of the group evaluated every child. Counting the average of the total score every child got a score that indicated the opinion of the group about the child in question.

At the end of the group process we asked the children to fill in this questionnaire again, but in that case only in two ways. We asked their own opinion and the supposed opinion of their classmates, since we were curious to know if the psychological events in an environment quite different from school and the feedback from the schoolmates change the self-image of the children or not.

Of course the whole group filled in the questionnaire regarding each of children again.

In the course of the statistical analysis we performed correlation calculations between each of the evaluation and we applied two-sample T-test for comparing boys and girls in each evaluation. Here are the data and the table of correlation (Table 5 and Table 6).

**TABLE 5**  
**Results of development of self-knowledge (1)**

	MO	FA	OWO1	OWO2
MO	1.0000	.9695	.9367	.9356
FO	.9695	1.0000	.9411	.9443
OWO1	.9367	.9411	1.0000	.9909
OWO2	.9356	.9443	.9909	1.0000
CMO1	.9568	.9386	.9370	.9462
CMO2	.9522	.9379	.9374	.9531
FMO	.9336	.9275	.9520	.9623
SchA	.5387	.5338	.5043	.5218
CMRO1	.9376	.9256	.9165	.9384
CMRO2	.9325	.9147	.9153	.9331

Number of cases: 39

1-tailed signif: -.01, -.001

(Mo: Mother; FO: Father; OWO1, 2: Own opinion 1, 2; CMO1, 2: Classmates' opinion 1, 2;  
FMO: Form-master's opinion; SchA: School achievement; CMRO1, 2: Classmates' real opinion)

**TABLE 6**  
**Results of development of self-knowledge (2)**

	CMO1	CMO2	FMO	SchA	CMRO1	CMRO2
CMO1	1.0000	.9949	.9541	.5396	.9519	.9466
CMO2	.9949	1.0000	.9592	.5467	.9553	.9525
FMO	.9541	.9592	1.0000	.5341	.9392	.9306
SchA	.5396	.5467	.5341	1.0000	.5677	.5619
CMRO1	.9519	.9553	.9392	.5677	1.0000	.9931
CMRO2	.9466	.9525	.9306	.5619	.9931	1.0000

### *Conclusions*

1. From the table of correlation values for the connection of almost every evaluation. In other words according to the opinion of the children their father, mother, classmates and form-master have the same opinion about them as they have about themselves. This fact indicates the lack of a definite social image but this is an acceptable phenomenon, of course, at that age. Nevertheless, the close correlation may also indicate that such important references have a striking role in the development of self-image of the children.
2. It is interesting to examine the connection between the first and second own opinion (given at the last meeting). This is the strongest of all of the correlations. This fact indicates to us that the students' self-evaluation remained very consistent during the period tested. The group process did not bring such new realizations for them that could lead to a change in their self-image. Quite the contrary: it helped to conform it. Of course a certain psychological fact can also play a significant role in it, namely people are susceptible only to such feedback signs of the surroundings that fit with their own self-evaluation.
3. The next important conclusion is that there is not a strong correlation between their own opinion and the real opinion of their classmates. The classmates evaluate differently from the own opinion of the children about themselves. However, it is very interesting that there is a strong positive correlation between the supposed and real opinion of the classmates. It shows that the children can predict the opinion of their classmates very well. Similarly to the permanence of own opinion, the opinion of classmates shows also a high correlation in the two different inquiries. We can stress the same thing in this case as well, namely the group process helped to maintain the image formed and to stabilize the opinions.
4. In the course of comparison of boys and girls the two-sample T-test could not indicate valuable result in any of the evaluation lines.

### **4. Connection between learning methods, self-evaluation and evaluation of other people**

We were searching for relations between performance reached by different learning methods, self evaluation and evaluation of other people as well. Here and now

we report only such data that can be important for reaching significant conclusions. Table 7 shows the values of correlation.

**TABLE 7**  
**Connection between learning methods, self-evaluation and evaluation of other people**

	OWO1	OWO2	CMO1	CMO2
LM	.2188	.2451	.0583	.0727
DLM	-.1985	-.1791	-.3018	-.2575

Number of cases: 39      1-tailed signif: -.01, -.001

### *Conclusions*

1. There is not any significant correlation between learning methods and self-evaluation and evaluation of other people.
2. On the other hand there is a negative correlation between development of learning methods and self-evaluation although this correlation is not significant. A possible reason for it is that the poorer opinion the pupil has of himself or herself, the higher motivation he or she has for reaching a better result and the new methods offer a good opportunity for it. Of course, in the background of this fact there is another reason, namely the group-norm in a class of talented pupils is endeavouring for better achievement.
3. There is a similarly negative connection between the result of development of learning methods and the classmate evaluation given by the pupils. The explanation of it is similar to the former: over and above the working-norm of endeavouring for better achievement the pupil aims at increasing his or her value in the schoolmates' view and it can be reached through eminent school achievement and effective learning methods. That is why pupils are motivated for development of the latter factor to a great extent and it is shown also by the result.

### **Conclusions useful for further talent developing work**

1. High level of intelligence does not run automatically together with developed learning methods. So special development of learning methods is important – even for talented children! In the course of this work we must pay attention to both direct and indirect developing. By direct developing we must make pupils train the learning methods which are missing from their methods; above all we must concentrate on the deep techniques. By indirect developing we must form the mental qualities which make the shaping of the more effective learning strategies possible.

2. Summarising the facts we confirm that our investigation found these children more talented than the average probably just before the great, typical, self-searching, uncertain struggles of adolescence when they were searching for the answer to the question: "Who am I?" We think it is important to help them with real self-knowledge and self-control (Freeman, 1991; Katzko & Mönks, 1995). The special developing programs must contain this element – according to the age – as well.
3. In this personality development process – as research results also show – group-norms get a significant role as well. The endeavouring to the possibly best achievement, which works in gifted pupils' class, plays a decisive role in self-development and self-control. Pupils in such surroundings also aim at rising their values in their classmates' view. To this the road goes directly through good achievement in school, indirectly through effective learning methods. This is also among the reasons why developing of learning techniques are so important at gifted children.

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## **Part Four: Special Issues**



# Motivational Roots of Giftedness and Individualism – Collectivism

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The present research investigated on human motivation (n Achievement, n Power, n Affiliation and Avoidance achievement motivation) and its consequences and relations to giftedness, abilities and individualism-collectivism as social orientation.

The participants were 282 undergraduate university students with high and medium level of abilities. Results highlight the relationships between the motivational components and individualism and collectivism, furthermore comparisons between the identified student groups indicated that the tendencies of motivational components are represented in how students with different abilities and various professions perceive themselves and others in social situations.

## Introduction

The nature of human motivation has captured the interest of researchers and personality theorists in the last decades (McClelland, 1987; Westwood, 1992; Winter, 1973). Early theoretical conceptualisations of motivation focused on individual differences in global motivational tendencies as central determinants of e. g. achievement behaviour (McClelland, D., Atkinson, J., Clark, R. & Lowell, E., 1953). Motives drive, orient and select behaviour. Obviously, motivation is an internal state experienced by the individual. Motivational construct develops within the individual and it is unique to that individual. The individual experiences a motivational state in a way that gives rise to a desire, intention or pressure to act. Motivation has an element of choice. That is, the individual experiencing a state of arousal (externally or internally generated), responds by choosing to act in a way and at a level of intensity that they determine. The motivational construct might indicate or influence the presence of different social orientations to fulfil special needs emerging in certain organizations (e.g. universities). One of the most important criteria for an intelligent person is adaptability, which can help the person – consciously or unconsciously – to realize the adequate forms of social orientations. The person in this situation applies a so-called “career component”. This component can be defined as the sum of those employed attitudes, attributions, intentions, behaviours and influential factors, which help people to fulfil their needs indicated by their unique organizational circumstances and motivational and personality constructs.

Specifically, we examined identified groups of students with different level of abilities and types of profession to investigate their motivational components using McClelland theories of n Achievement, n Power, n Affiliation and Avoidance achievement motivation.

The aim of this study was to reveal the relationship between motivation and giftedness. On the basis of theoretical research it becomes evident that motivation is one of the most important aspects of giftedness among high abilities and creativity. The question is whether there is a special motivational construct for talented students at all. To reveal talented students' motivational components seems highly important because they are expected to run the most successful scientific and creative career. We also questioned that who can be considered as a talented university student. Anybody might agree more or less that most of the university students have extraordinary abilities at least from a certain point of view. Therefore, to identify talented students we needed to develop a procedure to select them. We considered those students talented who have high level of scientific and academic achievement, participate in special colleges and their teachers and other students considered them talented.

We assumed that talented students have higher level of Achievement and Power motives, but we did not expect extremely different need for Affiliation. Another assumption was that talented students have lower level of Avoidance achievement motivation. For talented students we expected high level individualistic and at the same time collectivist tendencies.

Choosing vocation is one of the ways in which people can realise their potential (Holland, 1966). Holland emphasizes the importance of choosing a certain profession according to certain personality factors. In our study we show that individualism-collectivism has an important role in realising a profession and running a successful career.

However, motivational components as independent concepts besides personality in the case of university students have rarely been investigated. Students' motivational construct and their individualistic and collectivistic tendencies as personality factor were the objects of comparisons. We examined individualism-collectivism as social orientation in two separated dimensions. This two dimensional model realises the possibility of a complex social orientation with various level of individualistic and collectivist tendencies e. g. parallel high level of individualism and collectivism.

## Motivational components

In the studies of human motivation (Murray, 1938; Winter, 1973; McClelland, 1987) have been identified several types of motives within individuals which might drive their behaviour. We utilized McClelland's theories of achievement, power, affiliation motives and additionally the avoidance achievement motive.

*The Achievement Motive.* The definitions of achievement motive differ by age, sex and culture, but what is constant is the notion of doing something better than

others (McClelland & Koestner, 1992). People with high achievement motivation will act in ways that help them to outperform someone else, meet or surpass some standard of excellence, or doing something unique. High achievers prefer working on moderately difficult tasks and to work in situations where they take personal responsibility for their performance (McClelland & Koestner, 1992). People high in n Achievement tend to seek out and do better at moderately challenging tasks, take personal responsibility for their performance, seek performance feedback on how well they are doing and try new and more efficient ways of doing things. These characteristics should have important effects on the way people behave in "real life", in the social world.

*The Power Motive.* Another major motive is the power motive. It causes a person to desire „impact, control, or influence over another person, group or the world at large (Winter, 1973). Individuals with high n Power may satisfy motivational needs through leadership roles or offices, or by pursuing a career as a business executive, teacher, psychologist, or member of the clergy, which involve direct, legitimate, interpersonal power over others (Winter & Stewart, 1978). A possible version of the power system includes the power imagery, prestige, stated need for power, goal anticipation, hope for distinction.

*The Affiliation Motive.* The third of the major motives discussed by McClelland (1987) is the need for affiliation. An individual with high level of affiliation motive will emphasize the importance of mutual relationships. Affiliation motivation is defined as establishing, restoring or maintaining a close, warm, friendly relationship with another or others, or being emotionally concerned over separation from someone else (McClelland, 1987).

Characteristics of those with high need for affiliation are different from those with high need for power. Many studies show that people with a high need for affiliation act to avoid conflict and competition whenever possible (McClelland, 1987). In social interactions, those high in n Affiliation appear to be predisposed to be sympathetic and accommodating toward others (McClelland & Koestner, 1992).

Do people who score high in n Affiliation behave in distinctive ways that indicate they are more motivated for affiliation? Those who score high in it are energized to act more often in affiliate way. The need for affiliation also sensitizes people to affiliate cues. Individuals with a strong affiliate motive also perform better on tasks do not involve affiliate content if the incentive in the situation is shifted from achievement to affiliation.

*Avoidance achievement motivation.* Avoidance achievement motivation can be defined as the generalized desire to avoid failure (Emmons & McAdams, 1991). Elliot and Church (1997) proffered a model of avoidance achievement motivation that links goals to underlying motive dispositions. Fear of failure can be such a motive disposition underlying the pursuit of avoidance personal achievement goals. Individuals high in fear of failure characteristically orient toward the possibility of incompetence and this tendency likely promotes the use of specific self-regulatory forms focused on the avoidance of negative outcomes.

## Social orientation

We applied the two dimensional model of individualism and collectivism (Gelfand, Triandis & Chan, 1996) to predict those motivational components which lead to different tendencies of social orientation.

### *Individualism-collectivism as social orientation*

Individualism-collectivism constructs have been discussed in many contexts in social sciences. There was research on these constructs in the areas of values (Hofstede, 1980), social systems (Parsons & Shils, 1951), religion (Bakan, 1966), economic development (Adelman & Morris, 1967), ideology (Dumont, 1986), cultural patterns (Hsu, 1983) and the self (Markus & Kitayama, 1991). However, there is a need to broaden research to examine their possible relations to motivational components leading social orientation.

Specifically, Triandis (1995) argued that the four defining attributes of individualism and collectivism are (a) the definition of the self, which can emphasize personal or collective aspects, or can be independent or interdependent; (b) personal goals that have priority over group goals or vice versa; (c) the emphasis on exchange rather than communal relationships or the emphasis on rationality rather than relatedness; and (d) the importance of attitudes and norms as determinants of social behaviour. For individualists attitudes are more important than norms, but collectivists give more weight for norms than for attitudes.

The terms of individualism and collectivism are also used at cross-cultural level. Several studies proved that western countries tend to be more individualistic, while eastern ones are more collectivist in nature (Tafarodi & Swann, 1996). Highly collectivist cultures are defined as those that emphasize social interdependence, connectedness, and mutual deference or compromise as dominant values. Highly individualist cultures are defined oppositely, as those that emphasize independence, autonomy in choice and action, and social assertiveness (Triandis, 1995). However, there are many different forms of individualism and collectivism in different parts of the world.

The first empirical study to identify individualism and collectivism was conducted by Hofstede (1980), who assumed that the constructs of individualism and collectivism were bipolar, as they were considered opposites ends of one dimension. The literature on individualism and collectivism argues that they are independent dimensions. That is, a person can score high or low on both or high on one and low on the other. In our study following the latest empirical findings regarding the constructs of individualism and collectivism (Gelfand, Triandis & Chan, 1996), we analysed individualistic and collectivist tendencies in two separate dimensions (Csukonyi, Sallay & Münnich, 1999). In this two-dimensional model people can accept both individualistic and collectivist values on different level at the same time, or refuse both of them. There are people who prefer significantly individualistic or collectivist tendencies, and there are also people identified who seem not to show any preference toward these values.

## Method

### Participants

Participants were undergraduate students at the University of Debrecen ( $N=282$ ). They were between 18-24 years of age. 152 (55%) were female, and 130 (45%) were male. 78 (28%) of the participants were identified as talented students and 204 (72%) of them were students with medium level of abilities. The sample was representative for faculty and year of study.

### Procedure of identifying talented students

One hand talented students were identified relating to their scientific and academic achievement, their participation and membership in special colleges and on the other hand on the basis of their teachers' and other students' recommendations.

### Measures

All students were asked to fill in the following scales in the same order:

#### *Achievement Motivation Scale (Spence-Helmreich)*

Although there have been many attempts to capture the achievement motivation with objective measures (Smiths, 1973; Fineman, 1977; Spence-Helmreich, 1983), it is difficult to locate a scale which measures the need to achieve as McClelland does (achievement motivation as a drive to outperform someone else, to meet or surpass some standard of excellence, or to do something unique). Spence and Helmreich Achievement Motivation Scale was used in the present study to represent McClelland's concept as accurately as possible. The original scale contained 23 items (Cronbach alpha = .71), from which we left out 4 items to reach higher level of reliability. The items were assessed on a dichotomy scale, as 1 (true of me) and 0 (untrue of me). This scale had alpha reliability of .76.

#### *Power Motivation Scale (Frieze-Schmidt)*

McClelland (1987) defines power motivation as a desire for impact, control, or influence over another person, group, or the world at large. There are few power motivation measures available (e.g., Steers and Braunstein, 1976; Moser and Gerth, 1986) and those do not match McClelland's definition very closely. So 20 dichotomy items agreed with McClelland's definition of the need for power were used from Frieze-Schmidt Power Motivation Scale (1991). The alpha reliability coefficient for this scale was .74.

#### *Affiliation Motivation Scale (Mehrabian)*

McClelland (1987) defines affiliation motivation as acting in order to establish, restore or maintain a close, warm and friendly relationship with another or others, being emotionally concerned over separation from someone else, or being concerned with participating in friendly activities with others. Mehrabian (Mehra-

bian & Ksionzky, 1974) has developed a scale most closely following McClelland's definition of the need for affiliation. This scale contains the tendency of general expectation of the positive reinforcing qualities in others. This scale of 25 dichotomy items had alpha reliability coefficient of .76.

#### *Achievement Goals Questionnaire – avoidance motivation*

Measuring the concept of avoidance achievement motivation we modified the Achievement Motivation Questionnaire (AGQ) on the basis of Elliot and Sheldon's studies. It consists 51 preliminary goals (29 approach and 22 avoidance). Participants could either agree (choosing "yes") or disagree (choosing "no") with the statements during fulfilling the questionnaire according to what extent each statement described what they typically try to do in their everyday behaviour. We dropped out 3 items from the items of approach so we have an approach subscale containing 26 items with reliability of .81. The avoidance subscale remained containing 22 items with alpha reliability of .82.

*The Individualism-Collectivism Scale (Singelis, 1995)* was used to determine the concepts of individualism-collectivism. This scale contains 29 items, which are assessed on a dichotomy scale with 1 (true of me) to 0 (untrue of me). The scale measures individualism and collectivism as two separate tendencies. The concept of individualism was based on those 14 items that emphasise pleasure, enjoying life, being broadminded, choosing own goals, competition, being unique. The 15 collectivist items emphasise the importance of family security, good relationships, honouring parents and elders, respect for tradition. Higher scores indicate more agreement with individualistic or collectivist orientations. Individualism and collectivism scales proved to be reliable, as alpha coefficients showed (.73 and .74, respectively).

## **Results**

### *Motivational components*

ANOVAs showed significant differences between talented and the other students in the need for achievement (Table 1). Talented students showed significantly higher achievement motivation than the other students ( $F(1,280) = 10.04$ ;  $pA .008$ ). Talented students showed higher level of power motivation. They proved to be significantly stronger in power motivation and need to lead others ( $F(1,279) = 12.48$ ;  $pA .004$ ). We found that both groups of students showed high level of affiliation motivation. They both have the need for mutual social relationships with others on the same level. Otherwise there is no significant difference between the two groups of students in affiliation motivation ( $F(1,281) = 10.44$ ;  $pA .001$ ). Talented students have chosen significantly more approach achievement goals than avoidance ones, while the other students showed the opposite achievement construct ( $F(1,282) = 8.82$ ;  $pA .05$ ).

**TABLE 1**  
**Motivational constructs for students with different abilities**

Groups	Achievement motivation		Power motivation		Affiliation motivation		<i>Approach</i>	<i>Avoidance</i>
	Mean	Std	Mean	Std	Mean	Std		
Talented students (N= 77)	10.49	4.18	11.24	4.38	14.76	4.12	18.91	11.21
Other students (N= 203)	8.94	3.94	8.72	3.58	16.28	3.25	14.32	17.65

*Individualism-collectivism as social orientation*

Individualism and collectivism proved to be independent dimensions with value of .074 correlation. Standardized z-scores of both the individualism and collectivism scales made it possible to identify different types of individualistic and collectivist tendencies. The “Individualists” proved to be those subjects who rated significantly higher individualistic values in comparison with the mean of the total sample. On the opposite, “Collectivists” significantly preferred collectivist values to individualistic ones (Table 2).

**TABLE 2**  
**Comparison of social orientation for students with different abilities**

Groups	Individualism		Collectivism	
	Mean	Std	Mean	Std
Talented students (N= 77)	10.31	3.14	11.22	5.23
Other students (N= 203)	7.23	4.84	9.84	5.04

Talented students showed significantly higher individualistic and collectivist tendencies, they emphasized at the same time both values ( $F(1,281) = 9.08$ ;  $pA .001$ ).

*The relationship between motivational components for talented students*

Achievement motivation correlated .75 ( $p < .01$ ) with Power motivation. Power motivation also correlated -.31 ( $p < .01$ ) with Avoidance Achievement motivation. Avoidance achievement motivation had correlation of -.42 ( $p < .01$ ) with Affiliation motivation.

*The relationship of motivational components with social orientation for talented students*

The correlation that illustrates the relationships between the motivational components and the concepts of Individualism and Collectivism were generally high. The correlation between achievement motivation and Individualism was .64 and .21 ( $p < .01$ ) for Collectivism, respectively. The correlation of Power motivation with Individualism was significantly high ( $r = .50$ ,  $p < .01$ ), and ( $r = .38$ ,  $p < .01$ )

with Collectivism. Affiliation motivation correlated with Individualism -.32 ( $p < .01$ ) and .58 ( $p < .01$ ) with Collectivism. Avoidance achievement motivation had negative correlation with Individualism ( $r = -.25$ ,  $p < .01$ ) and .31 ( $p < .01$ ) for Collectivism.

*The relationship between motivational components for other students*

We found relatively high correlation between Achievement and Power motives ( $r = .58$ ,  $p < .01$ ). Power and Avoidance achievement motives correlated negatively ( $r = -.28$ ,  $p < .01$ ). The correlation between Avoidance achievement and Affiliation motives was significant ( $r = -.25$ ,  $p < .01$ ).

*The relationship between motivational components and social orientation for other students*

There were respectively lower correlation values of motivational components and social orientation for other students than talented ones. There was correlation of .568 ( $p < .01$ ) between Achievement motivation and Individualism, and a correlation of .34 ( $p < .01$ ) with Collectivism. The Power motive showed significant correlation with Individualism ( $r = .52$ ,  $p < .01$ ) and Collectivism ( $r = .42$ ,  $p < .01$ ). We also found significant correlation in the case of the Affiliation motive with Individualism ( $r = -.14$ ,  $p < .01$ ), and with Collectivism ( $r = .35$ ,  $p < .01$ ). Avoidance affiliation motivation correlated with Individualism positively ( $r = .42$ ,  $p < .01$ ), and with Collectivism negatively ( $r = -.29$ ,  $p < .01$ ).

## **Discussion**

The present research focused on the nature of motivational components relating to giftedness and social orientation. Following the constructs of the McClelland based motivational components we analysed Achievement, Power, Affiliation and Avoidance achievement motives within students groups with different tendencies in abilities and social orientation. The results highlighted the construct of the motivational components: the Achievement motive has a positive relationship with the Power motive, while the higher the scores of Power motive, the lower the ones of the Avoidance achievement motive. In the case of the Avoidance achievement motive a negative relationship with the Affiliation motive was documented.

The talented students emphasise more the importance of achievement, mostly approach achievement goals in every day life. It was realised that if individuals high in n Achievement they ought to behave in ways that, in under certain circumstances, would lead to greater success in the real world (McClelland, 1955). Talented students have higher need for power than average ones, but they did not show extremely high need for affiliation. Talented subjects had high rating for both collectivist and individualistic values, they have a so called complex social orientation.

In general, support for motivational roots of individualism and collectivism as social orientation was found in this research. The results of this study indicated

that the tendencies of motivational components are represented in how students perceive social situations.

Results showed that specific forms of motivational components and behaviour seem to form people's individualistic and collectivist tendencies. Before discussing the conclusions and implications of this study, it might be useful to overview some possible case how motivational components have an impact on social orientation. People with strong need for Achievement and Power seek for those situations in which they can compete with others and prove that they are better at doing something than others do. Strong positive relationship was observed between these motivational components and individualism and negative for collectivism. The effects of this motivational construct might form individualistic tendency. People high in Affiliation motivation seek for those situations in which they can co-operate with others and maintain mutual relationships. A strong positive relationship was observed between the Affiliation motive and collectivism, but negative with individualism. Collectivists may rather emphasize the importance those characteristics that are common in people, which help people to establish and maintain close, warm relationships. For Avoidance achievement motivation was observed to have positive relationship with collectivism, but negative with individualism. Collectivists may rather avoid those situations in which they ought to compete with others or outperform someone else. Therefore they avoid confrontation; they seem easily give up their personal goals for the sake of the aims of the groups. They follow so-called higher-level group goals instead of following their own personal purposes avoiding the possibility of incompetence, which could be happened in the case of confronting personal and group goals.

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# **Talented Adolescents: Impacts of Perceived Parenting Styles on Academic Achievement. A Pilot Study**

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Parental attitudes and child rearing have proved to play an important role in children's and adolescents' academic achievement (e.g., Leung & Kwan, 1997; Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997). In this pilot study perceived parenting attitudes and the level of satisfaction with these attitudes were studied amongst adolescents with good academic achievement ( $N=97$ ). Four types of maternal and paternal parenting backgrounds were identified based on the dimensions of nurture and restriction of the CRPR (Child Rearing Practices Report, Dekovic et al., 1991), namely, authoritative, authoritarian, neglecting and indulgent. Specific maternal and paternal parenting was measured by the PAQ (Parental Authority Questionnaire, Buri, 1991), and some newly developed scales for satisfaction with different parenting attitudes. Impact of the above mentioned parenting attitudes was explored on academic achievement in the four different maternal and paternal backgrounds. Results showed that subjects perceived the diverse parenting attitudes in the identified maternal and paternal parenting backgrounds differently, and the level of perceived parenting and satisfaction produced diverse impact on academic achievement.

## **Introduction**

Most parents have well-defined beliefs about the kinds of characteristics they would like to see in their children and the child rearing practices they should use to attain them. At the same time, parental practices must be adapted to the demands of a culture, and also to the needs and personal characteristics of the individual child. Research by Bloom (1985) and Bronfenbenner (1986) established that parents play a major role in children's cognitive development as well as academic achievement. Moreover, research by Amabile (1989) supports the theory that parental perspectives influence creativity. Results usually show that caring, supportive parents who are tolerant, and allow free thinking and independence, foster creativity and good academic achievement in children.

Parents' relationship with their children has frequently been conceptualized in terms of the interaction between two dimensions of parental behavior. The first deals with the emotional relationship with the child, while the second one relates to different forms of parental control. A classic study of Baumrind (1971) was one of the earliest systematic studies attempting to relate parenting typologies to children's behavior, and defining authoritative, authoritarian, and permissive parenting. Later, Maccoby and Martin (1983) called the attention on the importance of that kind of parenting that can be characterized by neglect and lack of involvement. Although Baumrind (1977, 1982) has not explicitly discussed the effects of her proposed parental prototypes upon the personality- and self-development of children, such effects have been implied in her findings. For example, she showed

that children of authoritative parents are more independent, more self-reliant, more responsible, and more global-oriented than are children of authoritarian or permissive parents. Almost a decade after the findings of Baumrind were published, Buri and his colleagues (1988) developed the Parental Authority Questionnaire, based on the theory of Baumrind. In his studies Buri (1989, 1992), besides many other authors (e.g., Edwards & Holden, 1989), proved that the child rearing practices of parents can be studied through the perception of adolescents' as well, not exclusively through direct observation of the parents.

The theoretical approach of the present study is also closely related to symbolic interactionism. Symbolic interactionists (e.g., Cooley, 1902; Mead, 1934) have proposed that one's self-concept is primarily affected by social interactions in the way and to the extent that one perceives those interactions. Our "imputed sentiments" (Cooley, p.152) of others' appraisals of us are more closely related to our self-concepts than are their actual appraisals of us. Consistent with this perspective, the subjective evaluation of mothers' and fathers' parental styles may influence the perception and evaluation of the school related activities and academic achievement of the individual to the extent and in the way that a person perceives that behavior.

Many studies during adolescence have examined the relations between parenting characteristics (e.g., parenting style and parental involvement) and adolescent outcomes (e.g., school achievement), but few studies have described the actual patterns of parenting during adolescence. Moreover, most of the studies have one or more of three major limitations. First, differences between mothers' and fathers' parenting were not considered in many of the studies, although research have reported differences in adolescents' perceptions of their mothers and fathers and in the influences of mothers' and fathers' parenting on adolescent outcomes. For example, adolescents tend to link more emotional attributes to mothers and more rigid and formal attributes to fathers (Pipp, Shaver, Jennings, Lamborn, & Fisher, 1985), and perceived their fathers to be authority figures who provided advice or practical matters and guidelines for behavior, whereas they perceived their mothers to be a combination of authority and equality, intimacy, and conflict. Second, many of the parenting studies do not consider a wider variety of parenting styles and parenting practices, but emphasize mostly control- and nurture-related practices. And lastly, most of the studies neglect, that maternal and paternal parenting and their perceptions are not independent of each other (e.g., Forehand & Nousiainen, 1993).

Studies describing the characteristics of parenting and their relation to talented pupils' outcomes are scarce. Rathunde (1996) in his study analysed how family support and challenge were related to talented students' optimal experiences (i.e., intrinsically motivated interest and flow experience) in school-related activities. He showed that adolescents' high support in their families were associated with parental reports of higher rewards nurturing their children. Moreover, those adolescents who perceived their families as combining contextual dimensions of challenge and support, reported more optimal experience in school tasks (i.e., more flow experience and undivided interest, or the combination of spontaneity and goal directedness. In another study, Okagaki and Frensch (1998)

explored the relations between parenting and the school performance of 10-year old children. Their results provided evidence of the importance of considering the constellation of parents' beliefs, goals for their children, and the type of help parents can offer children when working with parents to facilitate their children's school experiences. In this pilot study the perception of specific parental attitudes of talented adolescents showing a good academic achievement were studied in order to be able to explore their roles in academic achievement. Besides this, subjects also evaluated how satisfied they were with the different kinds of parenting under investigation. Our aim was to explore if the perceived parenting or the satisfaction with the given parenting had a greater impact on academic achievement in different parenting backgrounds provided by their fathers and mothers. We assumed the following hypotheses: (1) Subjects perceive and are satisfied differently with the specific parenting attitudes of mothers and fathers in the four parenting maternal and paternal backgrounds identified by us, such as authoritative, authoritarian, neglecting and indulgent; (2) Diverse parental backgrounds represent diverse socialization atmosphere, consequently even the very same type of parenting may produce different impact on academic achievement.

## Method

### *Subjects*

Two hundred eighty-six subjects took part in the study. We selected those students whose academic achievement – considering the means of the last semester – were over 4.00. (Note: In Hungary the worst evaluation is considered to be 1, while the best one is 5.) After this selection, ninety-seven subjects proved to be showing good academic achievement, out of which 36 were males and 57 were females. Subjects studied at different secondary schools in a bigger city in Hungary. All of them lived with families of origin.

After getting the necessary permission from headmasters of the secondary schools, pupils studying on the 10<sup>th</sup> grade were selected for data collection, where the mean age was 15,6 years. Participation in the study was voluntary. Trained students collected the data in classrooms. They visited each class four times, as pupils were asked to fill in numerous questionnaires. Two weeks passed between data collection times. Each of the respondents answered anonymous, but they had an identification number that they used on each occasion and wrote on the questionnaires. As subjects filled in each questionnaire with the identical item pool for mothers and fathers, the types of questionnaires regarding the parents were rotated: the same questionnaire for both parents were always collected at different times to avoid interaction effects.

### *Measures*

Regarding parenting, both standardized and recently developed questionnaires were applied. The Hungarian version of the Child Rearing Practices Report (CRPR, Dekovic, Janssens, and Gerris, 1991) measuring two dimensions of

parenting, nurture and restriction, was translated and back translation was also done. Thereafter, items were transformed for subjects to evaluate their mothers' and fathers' parenting on identical scales. The dimensions were nurture (16 items, e.g., "My mother/father respects my opinion and encourages me to express it.");  $\alpha_{\text{father}} = .91$ ;  $\alpha_{\text{mother}} = .90$ ) and restriction (16 items, e.g., "My father/mother expects me to be grateful and appreciate all advantages I have.");  $\alpha_{\text{father}} = .79$ ;  $\alpha_{\text{mother}} = .78$ ). The two scales were not correlated significantly with each other either for fathers ( $r = .115$ ) or mothers ( $r = .029$ ).

The Parental Authority Questionnaire (PAQ; Buri, 1992) was translated and back-translated into English. This measure is based on the theory of Baumrind, assessing parenting styles separately for mothers and fathers with the same item pool, asking subjects to evaluate mothers' and fathers' parenting on a 5-point Likert-scale (1: not characteristic at all, and 5: very much characteristic) on the following dimensions: authoritarian parenting (10 items e.g., "As I was growing up my mother/father did not allow me to question any decisions she had made.");  $\alpha_{\text{father}} = .79$ ;  $\alpha_{\text{mother}} = .79$ ), and authoritative parenting (10 items, e.g., "As I was growing up, once family policy had been established, my mother/father discussed the reasoning behind the policy with the children in the family.");  $\alpha_{\text{father}} = .69$ ;  $\alpha_{\text{mother}} = .78$ ). As scales assessing permissive parenting styles proved to show lower reliabilities ( $\alpha_{\text{father}} = .66$ ;  $\alpha_{\text{mother}} = .75$ ).

Parallel with these scales, our new measures intended to explore satisfaction with the above described parenting styles. We reformulated each item of the two measures, both for the satisfaction with the parenting of the mother and the father. Principal component analysis of the reformulated CRPR scales of restriction and nurture revealed a two-factorial solution with varimax rotation, showing high reliabilities both for father-related and mother-related items (for satisfaction with nurture:  $\alpha_{\text{father}} = .89$ ;  $\alpha_{\text{mother}} = .90$ ; for satisfaction with restriction:  $\alpha_{\text{father}} = .69$ ;  $\alpha_{\text{mother}} = .79$ ). Regarding the PAQ, the three-factor solution with varimax rotation, in line with the original measure was revealed again, both for the mother- and father-related items (for satisfaction with authoritarian parenting:  $\alpha_{\text{father}} = .66$ ;  $\alpha_{\text{mother}} = .80$ ; for satisfaction with authoritative parenting.  $\alpha_{\text{father}} = .72$ ;  $\alpha_{\text{mother}} = .73$ ; for satisfaction with permissive parenting:  $\alpha_{\text{father}} = .72$ ;  $\alpha_{\text{mother}} = .74$ ).

Academic achievement of subjects was explored in Mathematics, Hungarian language and literature, English language and History. These are subjects that are considered to be the most important for students studying in secondary schools in Hungary, forming an integral part of the final examination at secondary schools in Hungary.

## Results

### *Differences in the perception of maternal and paternal parenting*

First, perceived maternal and paternal parenting groups were created based on the evaluation of subjects given in the responses of the CRPR. In accordance with the theory of Baumrind, and the structure of this questionnaire, perceived mater-

nal and paternal authoritative, authoritarian, rejecting, and indulgent groups were created. The scales of nurture and restriction were set up by calculating the means of the relevant items of the given dimensions. Since the scales showed no correlation neither in case of maternal or paternal evaluation, and each found to approximate a normal distribution, each parent's perceived nurture and restriction raw scores were converted to standard scores ( $Z_{nurture}$  and  $Z_{restriction}$ ). In line with the theory of Baumrind (1977), specific types of parenting were defined in a two-dimensional space (where the two axes were defined by nurture and restriction). Authoritative parenting was described by positive nurture and restriction, authoritarian parenting was characterized by lack of nurture but positive restriction; on the opposite, perceived rejection was defined by lack of nurture and restriction, while perceived indulgence showed no restriction but nurture.

This procedure was done both for perceived maternal and paternal parenting. The distribution of subjects between maternal and paternal parenting styles is depicted in Table 1.

**TABLE 1**  
**Distribution of subjects in maternal and paternal parenting backgrounds**

Parent	Authoritative	Authoritarian	Neglecting	Indulgent
Father	23	17	19	22
Mother	15	27	19	22

One-way ANOVAs revealed the differences between identified maternal groups regarding the perception and evaluation of each specific dimension of the PAQ, and satisfaction-related scales of maternal parenting. The perception of maternal parenting attitudes proved that the highest level of authoritarian attitudes ( $F_{(3,79)} = 3.497$ ;  $p \leq .020$ ), and the satisfaction with restriction ( $F_{(3,61)} = 3.44$ ;  $p = .023$ ) were significantly the highest in the authoritative maternal background. At the same time, perceived authoritativeness ( $F_{(3,79)} = 12.031$ ;  $p \leq .000$ ), and satisfaction with nurture were the highest in the indulgent maternal background ( $F_{(3,59)} = 3.444$ ;  $p \leq .023$ ). The means for each maternal background are depicted in Table 2.

**TABLE 2**  
**Means (M) and standard deviations (SD) of maternal parenting styles in the four maternal parenting backgrounds**

Parenting styles	Authoritative		Authoritarian		Neglecting		Indulgent	
	M	SD	M	SD	M	SD	M	SD
Authoritarian	<b>3.00</b>	0.61	2.76	0.72	2.30	0.70	2.43	0.70
Authoritative	3.91	0.59	3.50	0.63	2.99	0.64	<b>4.01</b>	0.48
Satisfaction with restriction	2.93	0.56	<b>2.94</b>	0.70	2.51	0.77	2.27	0.69
Satisfaction with nurture	4.36	0.52	3.86	0.75	3.63	0.54	<b>4.46</b>	0.30

Regarding the perception of paternal parenting, subjects were the most satisfied with fathers' nurture ( $F_{(3,55)} = 6.350$ ;  $p \leq .001$ ), and authoritativeness ( $F_{(3,54)} = 3.662$ ;  $p \leq .018$ ) in the authoritative paternal background. The highest level of fathers' authoritarian attitudes could be observed in the authoritarian paternal background ( $F_{(3,79)} = 6.188$ ;  $p \leq .001$ ), while subjects observed the highest level of authoritativeness ( $F_{(3,79)} = 5.825$ ;  $p \leq .001$ ), permissiveness ( $F_{(3,78)} = 4.362$ ;  $p \leq .007$ ) in the indulgent paternal background. The means for each above mentioned parenting are shown in Table 3.

**TABLE 3**  
**Means (M) and standard deviations (SD) of paternal parenting styles in the four paternal parenting backgrounds**

Parenting styles	Authoritative		Authoritarian		Neglecting		Indulgent	
	M	SD	M	SD	M	SD	M	SD
Authoritarian	<b>2.70</b>	0.66	<b>2.70</b>	0.67	2.17	0.48	2.03	0.64
Authoritative	3.42	0.59	2.96	0.60	2.91	0.70	<b>3.65</b>	0.72
Permissive	2.69	0.62	2.31	0.57	2.90	0.50	<b>2.91</b>	0.53
Satisfaction with authoritative	<b>4.02</b>	0.41	3.34	0.77	3.48	0.57	3.78	0.60
Satisfaction with nurture	<b>4.29</b>	0.43	3.54	0.76	3.44	0.52	3.99	0.61

#### *The impact of parenting attitudes on academic achievement*

Based on the bivariate correlations between parenting styles and grades of Mathematics, Hungarian grammar and literature, English language, and History, impacts of parenting and satisfaction with different parenting styles were revealed in the identified maternal and paternal parenting backgrounds (authoritative, authoritarian, rejecting and indulgent). Multiple regression analysis were conducted regarding each maternal and paternal background to reveal the impact of parenting styles on the grades of Hungarian grammar and literature, English language, Mathematics and History. In the authoritarian maternal background the impact of the satisfaction with mother's nurture resulted in better grades of Hungarian grammar and literature ( $F_{(1,10)} = 10.288$ ;  $p \leq .011$ ), explaining 53% of the variance. The more satisfied subjects were with their mother's nurture, the higher grades could be observed. Satisfaction with maternal nurture also had a positive impact on achievement in English language ( $F_{(1,10)} = 8.578$ ;  $p \leq .017$ ), explaining 49% of the variance. Mother's authoritarian attitude had a negative impact on achievement in History ( $F_{(1,13)} = 5.019$ ;  $p \leq .045$ ), explaining 29% of the variance. The less authoritarian mothers proved to be, the better grades were revealed in History. In the authoritarian maternal background mother's permissiveness had a negative impact on the achievement of Mathematics ( $F_{(1,22)} = 10.627$ ;  $p \leq .004$ ), explaining 33% of the variance. The more permissive mothers were, the lower achievement could be predicted in Mathematics. The same attitude also had a negative impact on the achievement in History ( $F_{(1,22)} = 10.672$ ;  $p \leq .004$ ), explaining 33% of the variance. In the neglecting maternal background satisfaction with maternal nurture predicted better achievement in English language ( $F_{(1,12)} = 19.625$ ;  $p \leq .001$ ), explaining 64% of the variance. Higher level of nurture resulted

in better grades. Satisfaction with maternal authoritative attitudes resulted in better grades of History ( $F_{(1,12)} = 5.406$ ;  $p \leq .040$ ), explaining 33% of the variance. In an indulgent maternal background satisfaction with maternal authoritarianism predicted lower grades in Mathematics ( $F_{(1,12)} = 9.950$ ;  $p \leq .009$ ), explaining 47% of the variance. The results are depicted in Table 4.

**TABLE 4**  
**Maternal parenting styles and their impact on academic grades**

Predictor	R	R <sup>2</sup> -change	b	beta	T	p
<i>1. Authoritative maternal background</i>						
Satisfaction with nurture ( $F_{\text{total}} (1,10) = 10.288$ ; $p = .011$ )						
Hungarian grammar and literature	.73	.53	.98	.73	3.207	.011
<i>2. Authoritarian maternal background</i>						
Permissive attitudes ( $F_{\text{total}} (1,22) = 10.627$ ; $p = .004$ )						
Mathematics	.58	.33	.66	.58	3.260	.004
Permissive attitudes ( $F_{\text{total}} (1,22) = 10.672$ ; $p = .004$ )						
History	.58	.34	.72	.58	3.267	.004
<i>3. Neglecting maternal background</i>						
Satisfaction with nurture ( $F_{\text{total}} (1,12) = 19.625$ ; $p < .001$ )						
English language	.80	.64	1.47	.80	4.430	.001
Satisfaction with authoritative attitudes ( $F_{\text{total}} (1,12) = 5.406$ ; $p < .040$ )						
History	.57	.33	1.33	.57	2.325	.040
<i>4. Indulgent maternal background</i>						
Satisfaction with authoritative attitudes ( $F_{\text{total}} (1,12) = 9.950$ ; $p = .009$ )						
Mathematics	.69	.47	1.33	.69	3.154	.009

Regarding authoritative paternal background, satisfaction with father's permissive attitudes produced better grades in English language ( $F_{(1,20)} = 5.023$ ;  $p \leq .037$ ), explaining 21% of the variance. Father's permissive attitudes resulted in lower grades of English language. The more permissive fathers were evaluated, the lower grades subjects had. Father's authoritative attitudes had a negative impact on achievements in Mathematics ( $F_{(1,21)} = 7.229$ ;  $p \leq .014$ ), explaining 27% of the variance. The more authoritative fathers were evaluated, the worse grades subjects had. Father's permissiveness resulted in lower grades of History ( $F_{(1,20)} = 5.887$ ;  $p \leq .025$ ), explaining 24% of the variance. The more permissive fathers were, the lower achievement in History could be observed. In an authoritarian paternal background father's permissive attitudes resulted in lower grades of Hungarian grammar and literature ( $F_{(1,15)} = 5.495$ ;  $p \leq .034$ ), explaining 28% of the variance. The more permissive fathers were perceived, the worse achievement could be observed. Satisfaction with father's authoritarian attitudes had a positive impact

on the grades of History ( $F_{(1,9)} = 5.420$ ;  $p \leq .048$ ), explaining 40% of the variance. The more satisfied subjects were, the higher achievement could be observed in the grades of History. The results are shown in Table 5.

**TABLE 5**  
**Paternal parenting styles and their impact on academic grades**

Predictor	R	R <sup>2</sup> -change	b	beta	T	p
<i>1. Authoritative paternal background</i>						
Permissive attitudes ( $F_{\text{total}} (1,20) = 5.023$ ; $p = .037$ )						
English language	.46	.21	-.81	-.46	-2.241	.037
Permissive attitudes ( $F_{\text{total}} (1,20) = 5.887$ ; $p = .025$ )						
History	.49	.24	-.82	-.49	-2.426	.025
Authoritative attitudes ( $F_{\text{total}} (1,21) = 7.279$ ; $p = .014$ )						
Mathematics	.52	.27	1.037	.52	2.698	.014
<i>2. Authoritarian paternal background</i>						
Permissive attitudes ( $F_{\text{total}} (1,15) = 5.495$ ; $p = .034$ )						
Hungarian grammar and literature	.53	.28	-.69	-.53	-2.344	.034
<i>3. Neglecting paternal background</i>						
Satisfaction with authoritarian attitudes ( $F_{\text{total}} (1,9) = 5.420$ ; $p = .048$ )						
History	.63	.40	2.137	.63	2.328	.048

## Discussion

In the present study we analysed the perception of maternal and paternal parenting and talented students' satisfaction with different parenting styles. Our results showed that mothers and fathers provide a general parenting background, where given parenting styles manifest on a different level, forming an inter-related socialization background. In general, mothers proved to be more nurturant and authoritative, compared to fathers, who were more authoritarian and restrictive, irrespective of the identified parenting backgrounds. This result is in line with previous studies proving that maternal warmth and nurture are the part of maternal identity, while more authoritarian attitudes of the fathers relate to their masculine identity (e.g., Cast, 1999; Deaux & Lafrance, 1998). The different parenting styles could be observed to function on a different level in the four parenting backgrounds, in case both of mothers and fathers, as also previous studies showed (Sallay & Münnich, 1999). This fact is very important in analysing impacts of parenting, as the parenting styles do not express themselves correctly the general maternal and paternal attitudes toward child rearing. We also explored the role of being satisfied with different parenting practices. Our results proved that this variable really has a predictive value in exploring parenting outcomes.

The other purpose of this study was to show the relation between parenting variables and academic achievement in talented adolescents. In general, satisfaction with nurture and authoritative attitudes of the mother proved to be an

important predictor for better grades, irrespective of maternal parenting background. However, the compensatory tendencies in each maternal parenting background can be described. It means, that for example, in an authoritative maternal background the observed impact of the permissive attitudes (which is manifested in this background on a very low level) would enhance academic achievement. Regarding fathers, the overwhelming impact of permissive attitudes can be mentioned that produce diverse impact in different paternal parenting backgrounds on academic achievement.

Obviously, this research has some important limitations. First, identifying "clear" patterns of parenting backgrounds is always problematic. Second, each background might manifest even more specific parenting attitudes, producing pervasive impact on diverse outcomes. However, we hope that this kind of approach may contribute to our understanding of how to help talented adolescents, and thereby help practitioners and experts to make successful interventions.

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# A Study on the Self-concept of High Ability Children Based on Marsh Scale

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## Introduction

My presentation focuses on the relationship between family environment and the self-concept of high ability children.

All of us know that family background influences the process of socialisation, the development of personality and, what is even more important in connection with this research, the formation of self-concept.

Concerning self-concept we claim that it changes continuously in our life but we make an effort to have a standard self-concept and it is multifaceted, hierarchical, and multidimensional.

Those possessing a positive self-concept are aware of their abilities; they are venturesome and success-seeking.

These individuals are more independent, more conscious of their acts, more able to adapt to social norms; their social relations are good and their academic achievements are in accordance with their capacity or even better than that. The Pygmalion-effect; a phenomenon well-known in the field of teaching enhances children's self-concept to be more positive, since a trustful and loving atmosphere improves self-esteem.

The characteristics of a person possessing a positive self-concept are the following:

- His/her self-concept enhances social success.
- His/her behaviour is determined by inner norms and values rather than by constraint from the outside world.
- He/she trusts in himself/ herself; can cope with difficult situations.
- He/she takes the responsibility for his/her behaviour.
- He/she admits the true motivation of his/her acts.
- He/she has self-knowledge; knows that there are certain positive characteristics that he/she doesn't possess.
- He/she feels equal to other people.
- He/she does not feel an urge to reveal his/her disadvantageous features and thus does not need to degrade himself/herself.
- He/she is neither overly self-confident, nor does he/she loose self-confidence too easily.

All of these characteristics are determined by not only the parents, but also by the socialising style of teachers.

### **Sample**

In our investigation we selected 151 gifted children as being potentially gifted through various ability and personality tests. They were selected by the assessment of the following: attention, visual and verbal memory, problem solving; general school achievement (i.e. school grades, teachers' judgements and test-scores in literature and mathematics).

The research is carried out with groups of children from Classes 5-8 who attend special classes (in state schools). There was a control group of 147 average ability children as a basis of comparison.

### **Instrument**

Marsh Scale (SDQ I): Physical Appearance (n=3); Physical Abilities (n=4); Parent Relations (n=5); Social Relations (n=4); General School (n=5); General Self (n=9); Verbal (n=5); Maths (n=5).

### **Hypotheses**

On the basis of variables and literature data our working hypotheses were the following:

1. There were expected to be significant differences between the qualifications of the parents in the case of the two groups (experimental and control).
2. It was expected that highly able children have more positive self-concept than average ability children (cf. Tannenbaum, 1986).
3. It was expected that academically gifted children have higher scores on academic self-concept but lower scores on social self-concept than non-gifted children (cf. Ross and Parker, 1980).
4. There should not be significant differences in general self-concept between the gifted and the non-gifted (cf. Mönks and Van Boxtel, 1985).
5. The experimental group should show higher scores on parental relation self-concept than the control group.

### **Results and discussion**

In the preliminary analysis of our data we compared the parents' qualifications between the two groups. In Table 1 we can see the differences between the parents' qualifications concerning the gifted and the non-gifted (Mann-Whitney test:  $p=0.000$ ), as well as the differences between the fathers and the mothers in the case of the two groups (Wilcoxon test:  $p=0.000$ ). The differences seem to be significant (see Table 2). It is striking that the mothers' qualifications are higher

than the fathers'. This is different in other countries, it is a special Hungarian phenomenon, which can be explained with different reasons. One possible explanation may be that girls are generally more diligent, persistent and they can fit in the Hungarian educational system more, so they manage to reach higher qualifications. There may certainly be a number of other reasons as well.

**TABLE 1**  
**Difference between gifted and non-gifted group for parents' qualifications**  
(Mann-Whitney Test)

	Group	N	Mean rank	Sum of ranks
Fathers' qualifications	gifted	151	184.92	27922.5
	non-gifted	147	113.12	16628.5
	sum	298		
Significance: 0.000				
Mothers' qualifications	gifted	151	183.94	27775.0
	non-gifted	147	114.12	16776.0
	sum	298		
Significance: 0.000				

**TABLE 2**  
**Means of fathers' and mothers' qualifications**

	Gifted	Non-gifted
Fathers' qualifications	4.3510	2.6395
Mothers' qualifications	4.7219	3.0068

1=primary school

8=university

**TABLE 3**  
**Means of domain scores by group and gender for Marsh Scale (2 ways of ANOVA) (Class 5)**

Subscales	Mean		p	Mean		p	Interaction p
	Gifted	Non-gifted		Male	Female		
Physical Appearance	9.82	9.72	.56	9.95	9.59	.15	.67
Physical Abilities	15.09	15.23	.63	16.10	14.25	.00	.87
Parent Relations	22.50	22.65	.80	22.79	22.37	.18	.80
Social Relations	15.23	15.13	.64	15.33	15.03	.33	.44
General School	16.74	16.11	.05	16.72	16.15	.07	.57
General Self	33.54	32.73	.04	33.97	32.33	.00	.65
Verbal	18.43	18.03	.74	17.52	18.92	.00	.20
Maths	16.88	18.03	.18	18.91	16.02	.00	.06*

#### \*Interaction in Maths

	Gifted	Non-gifted
Male	19.06	18.80
Female	15.35	16.98

We can see from Table 3 that there is a difference between genders, i.e. boys are better at Maths than girls. It seems to be a fairly general tendency, so we can accept that there is a significant difference between gifted males and gifted females and the difference in the gifted group is higher than that in the non-gifted group. It also means that gifted boys have more positive self-concept in Maths than gifted girls, but this difference is lower than in the case of non-gifted girls, i.e. non-gifted girls have more positive self-concept than gifted girls.

How can we explain this?

We think that the difference between genders does not need to be explained.

There is another, more exciting question, which is, why gifted girls have lower scores on self-concept regarding Maths than non-gifted girls.

One possible answer might be that boys in the gifted group excel in Maths so much that girls with somewhat poorer ability value themselves much lower relatively than non-gifted girls with similarly poorer ability, who attend an average (non-gifted) class and who do not have such excellent classmates to compare their ability to (non-gifted boys).

What do further results mean?

We did not find significant differences either between the gifted and the non-gifted groups or between males and females in Physical Appearance, Parent Relations and Social Relations.

In Physical Abilities there is no difference between the two groups, nevertheless, there does seem to be a significant difference between males and females, i.e. boys have a more positive overall self-concept in Physical Abilities.

In General School and General Self there are significant differences between both the groups and the sexes, which means that gifted students and boys have higher scores in the subscales mentioned above.

Girls have higher scores in Verbal Ability, but there is no difference between the gifted and the non-gifted.

Summarising our results we can say that gifted children are better in General School and In General Self.

Boys have more positive self-concept in Physical Abilities, General School, General Self and in Maths but girls have higher scores in Verbal Abilities.

Table 4 shows that the mean of Self-concept and that of Social Relations is higher. This may reflect the importance of parents at this age (10-year-olds).

**TABLE 4**  
**Descriptive Statistics of domains of Marsh Scale**

Subscales	Minimum	Maximum	Mean	Std. Deviation	N
Physical Appearance	1.00	5.00	3.2584	.7741	298
Physical Abilities	1.50	5.00	3.7919	.8218	298
Parent Relations	2.40	5.00	<b>4.5161</b>	.5232	298
Social Relations	1.25	5.00	3.7961	.6910	298
General School	1.00	5.00	3.2866	.6508	298
General Self	2.00	4.89	3.6827	.5217	298
Verbal	1.60	11.00	3.6470	.8439	298
Maths	1.00	5.00	3.4899	.9271	298

**TABLE 5**  
**Marsh Scale (Paired Samples Test)**

Subscales	Mean (N=108)	p (Sig. 2-tailed)
Physical Appearance	-.59	.013
Physical Abilities	.92	.006
Parent Relations	.75	.011
Social Relations	-.26	.28
General School	1.57	.000
General Self	-6.48E-02	.89
Verbal	1.12	.02
Maths	2.41	.000

In Table 5 (above) we can see the results of the paired t-test, in which we indicate the differences between the first (Class 5) and the second (Class 8) MARSH scales per item. The negative value suggests personal development by the time of the second test.

There are only two subscales, where there does not seem to be a significant difference (Social Relations and General Self-Concept). General tendencies are reflected in the mean values.

Next we examined whether the change in question depends on either the group or the gender of the members and whether the latter two would interact.

**TABLE 6**  
**Marsh Scale (2 ways of ANOVA)**  
**Marsh 1 (Class 5) – Marsh 2 (Class 8)**

Subscales	Mean		p	Mean		Interaction p	
	Gifted	Non-gifted		Male	Female		
Physical Appearance	-.32	-.88	.22	-.82	-.32	.46	.03*
Physical Abilities	1.26	.55	.51	.18	1.78	.02	.83
Parent Relations	.83	.67	.72	.75	.76	.92	.49
Social Relations	-.19	-.34	.81	-.50	1.15	.38	.21
General School	1.85	1.26	.27	1.67	1.46	.55	.19
General Self	.71	-.90	.13	-.84	-.84	.15	.28
Verbal	.44	1.86	.28	2.13	-4.00E-02	.05	.73
Maths	1.10	3.82	.03	2.93	1.82	.51	.11

\*Interaction in Physical Appearance

	Gifted	Non-gifted
Male	-1.08	-.63
Female	.29	-1.31

There is a significant difference between gifted girls and non-gifted girls in Physical Appearance, i.e. the change compared to previous data is more positive in the case of non-gifted girls, than gifted ones.

In the case of boys this change is reversed, which means that gifted boys seem to have changed more and improved with time. There seems to be a difference at this point between gifted and non-gifted girls, which may result from interaction.

In Physical Abilities only gender differences can be demonstrated. Both the boys and the girls have lower scores, but the difference (decrease) is more significant in the case of girls than boys.

The domain of Verbal Abilities also reflects gender differences with females developing more, gaining a more positive self-concept in this area than boys who show lower scores compared to the results of the previous administration of the test.

The next subscale was Maths. The only difference in this domain was between the two groups, which means that non-gifted children's scores were lower compared to the previous administration than those of the gifted children's.

*Summarizing* our results we can claim that the parents, mainly the mothers of gifted children have generally higher qualifications. This result emphasises not only the principles of heredity but the role of conscious upbringing and that of the parents' interest in the child's school progress in the formation of his/her abilities and successes.

The child's innate potential also influences the formation of his self-concept, because if children are successful at school, they are probably more popular among peers and their parents are also proud of them, which make their self-concept positive both generally and in relation to their parents. It makes them more confident and acting in a more determined manner will, in turn, impress those in their immediate environment (teachers, peers).

Academically talented pupils did not report lower social self-perception than a group of adolescents used as a basis of comparison. Findings from the present study demonstrate that academically talented students vary in their self-perception and needs.

#### *Conclusions:*

Healthy parent-child interactions are important to the positive adjustment of gifted youngsters. Cooperation between school and home is very important because close cooperation between parents, peers, school and community will exert a favourable influence on the evolvement of the talent of the gifted.

The studies imply the importance of the home environment and that of the family relations on the later achievement of high-ability youngsters. The descriptive study provides insight into the self-concepts of students. This study highlights the importance of balancing the affective growth with the cognitive and social development of gifted children.

It is important that researchers continue to study talent(s). Such studies will not only dispel unfounded myths, but may also provide insight into the nature of human capabilities.

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# A Study on the Everyday Questions of Talent Development

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Beyond the work and effort of teachers and psychologists, the development of a talented child requires a great deal of support and expenditure from the people in his or her immediate environment. Although this support is fundamental and indispensable, not until recently have experts started to pay sufficient attention to it, which is not surprising as it is provided in the background and is thus harder to measure and less spectacular.

We consider the support of family members fundamental in activities like accompanying the child to school, studying with him or her, providing other school and extracurricular programmes and financial support for him or her.

Our questionnaire tried to examine some aspects of talent development, which had not been studied comprehensively in Hungary before. The questionnaires were given to parents whose children attend one of the primary schools with talent development programs of Eastern Hungary – in Mátészalka, Szerencs and Törökszentmiklós. The parents, who were contacted through the teaching staff, participated in the study keenly: 258 questionnaires were answered, of which 255 were processed. Data were analysed by SPSS.

We were interested to see how family structure, the parents' qualifications, and the child's specific abilities etc. influenced the time and money spent on the talented child, which was studied under the following headings:

- the distance between home and school
- the parents' qualifications and the time they spend with the child
- abilities
- money spent on developing programmes
- other expenses
- daily schedule
- activity at home
- family background

### The distance between home and school

Our assumption was that children attending the above mentioned talent developing centres would probably have to travel long distances, because these centres are not the district schools, nearest their home. The long distance, we assumed, would mean greater costs for the family, as an adult would probably have to accompany the child, perhaps help him or her carry some of the things necessary for school, which would add to the fare.

Surprisingly enough, we found that only 13.51% of the children commute from a distance greater than 10 km, a high percentage (41.89%) of them live within 1 km of the school.

“A greater percentage of the children who lived in the same town as the school continued their studies at schools of higher prestige than those who did not manage to find a suitable school in their hometown”, writes Mihály Andor (Andor, 2000). That is to say, children (and their parents) prefer a talent developing school of greater challenge to schools without such specialized classes if they have one in or near their hometown. If their hometown offers no choice, children rather stay in the local school with lesser prestige.

Our results show that this proximity eases the burden of the families, because only 28.23% of the children are accompanied to school. Whether a child is accompanied to school is related to age (the older the child, the less likely he is to be accompanied to school), but it is not related to the distance between the school and the home. It is probably determined by family attitudes and traditions.

Children are accompanied to school by their fathers in the first place, and by their mothers in the second place. It does not seem to be the responsibility of other members of the family (siblings or grandparents).

Very few (7.05%) of the children are accompanied to extracurricular activities, although those are probably in the afternoon or in the evening.

The fact that some children chose schools 50-60 km away from their homes is evidence for the school’s great prestige.

### The parents’ qualifications and the time they spend with the child

We assume that parents with higher qualifications spend more time with developing their talented children than those with lower qualifications. This may be due to the fact that the former consider talent more valuable on the one hand, and working flexitime may give them more time to spend with their children, on the other.

Most of the parents with children in talent developing schools finished their education after secondary school (mothers: 49.8%, fathers 39.6%), while 36.5 % of the mothers and 27.1% of the fathers have degrees from college or university, and only 3.5% of the mothers and 1.2% of the fathers finished their studies after primary school. Our results show that mothers are generally more highly qualified than fathers, but there are also more women than men in the group with low qualifications.

According to Andor's study, the higher the parents' qualifications, the more likely their children are to go to special classes, private lessons or talent developing schools in order to acquire higher quality education (Andor, 2000). The above parents often chose to develop their children's talent through private lessons outside the school, despite the fact that they cost much more than special study circles at school. According to Andor's data, parents in white-collar jobs spend more money on developing their children. It is the cultural attitude rather than the financial situation of the family that determines the family's choice of secondary school and the talent developing programmes in the senior classes of primary school. (Only 4.5% of the respondents mentioned financial limitations. Andor, 1998) Our findings bear out the same trend; the difference is due to the uneven distribution of the sample.

Unfortunately, very few people answered the question of "How much time do you spend with developing your child's talent a week and with what activities". The reason may have been that it is a difficult question to give an exact answer to, and parents do not often calculate the time spent with such activities. Disregarding the insufficient data for mothers and fathers without secondary education, we found no significant difference between the time parents with different qualifications spent with their children. There was a difference, however, between mothers and fathers; mothers spent much more time with their children than fathers did.

On average, mothers who did skilled work spent 3.91 hours, mothers with secondary education spent 4.45 hours, and mothers with college or university degrees spent 4.07 hours a week with their children, which does not seem too much but we only processed the data from those who responded by giving a numerical answer.

Fathers with different qualifications differed even less; on average, they spent 2.7 hours a week with their children.

## **Abilities**

There are a number of different classifications of abilities in the literature. Rezulli's classification of general and specific abilities fits the abilities that can be described with reference to the different school subjects, which the parents had in mind when answering the questionnaire.

12.52% of the parents did not answer the question "In which area does your child demonstrate talent?", i.e. they could not identify a single area. 54.9% of the children were reported to excel in two, 23.5% in three and 10.98% in four areas by their parents.

The abilities mentioned by the parents could be classified into 15 categories.

The abilities most often mentioned in the first place were languages (19.6%), mathematics (12.9%) and humanities (10.6%). Among the abilities mentioned in the second place languages were again the most frequent (10.2%), followed by literature (6.7%) and arts (5.9%). The abilities mentioned in the third place were led

by biology and sport/dance (both 3.9%), followed by history (2.7%) and information technology (2.4%).

Chemistry and geography were the least often mentioned areas. This is not surprising, considering that children start to study those subjects in later years, consequently, they can only demonstrate their ability in them later.

We also wanted to know how long the child had been participating in talent development, which happens in the senior classes of primary school (Classes 5-8). The answers correlated with the children's age. The most frequent answer for those in the fifth class was one year, for those in the sixth class two, for those in the seventh class three and for those in the eighth class four years. There was one exceptional answer, which stated that the child had been participating in talent development ever since he was born.

### **Money spent on developing programmes**

The responses show that children participate in development programmes corresponding to the abilities mentioned in the first place, which are primarily languages, mathematics, sports and music.

78.43% of the children participate in at least four kinds of developing programmes at school and outside school.

Developing programmes often involve additional expenses for families. Developing programmes most often cost less than 1.000 Ft per month. There are fewer programmes that cost between 1.000 and 3.000 Ft a month, and children very rarely participate in programmes costing more than 3.000 Ft a month. The same trend can be seen across the age groups.

### **Other expenses**

Only 23.13% of the respondents answered the question "What other expenses does developing the child require?" Perhaps the family has no other expenses, perhaps they do not know how much they spend on the child or they may not want to answer questions of a financial nature. "Based on our research experience of recent years, we find all responses to questions concerning money matters unreliable", writes Andor in an article published in 1998. The answers to our question, consequently, are no more than signals.

Those who answered the above question spend most money on books and lexicons, and only a little less on private teachers. This is followed by travel expenses, equipment necessary for the development of the specific ability, cassettes and CDs, and the entry fees of competitions and fees of language examinations should also be mentioned. 41.79% of the above items costs less than 1.000 Ft a month, 28.38% costs between 1.000 and 3.000 Ft a month, and only 23.88% costs more than 3.000 Ft a month. Of all the respondents, there is only one who spends more than 10.000 Ft a month on the above.

## Daily schedule

School age children spend a significant part of their lives at school. How much time they can spend with relaxation and hobbies after school is a very important question. Judit Kiss Pasku (2000) writes in her study, "there was hardly a child who was not involved in any extracurricular activities in addition to his/her lessons at school".

Our findings showed that the children's daily workload at school has little to do with their age. The weekly workload for fifth formers is ~29 hours, for sixth formers ~29.5 hours, for seventh formers ~30 hours and for eighth formers ~31 hours. Children seem to have the fewest lessons on Friday; the number of lessons is evenly distributed on the other days of the week. Private lessons are generally thought to be more important, but research has not proved that children spend more time with going to private lessons than with other extracurricular activities. (Kiss-Pasku, 2000) The average load of private lessons is evenly distributed, but some children are extremely overburdened: on some days they may go to three different private lessons after seven lessons at school and before studying as much as four hours at home. We consider that this is too tight a schedule, even for an adult.

Interestingly enough, most of the parents failed to answer the questions about private lessons. Consequently, we used the data of those who gave definite answers. On weekdays, fifth formers have 1.75, sixth formers 1.44, seventh formers 1.62, and eighth formers 1.55 hours of private lessons. The question arose why the youngest children have the most private lessons. Perhaps because the enthusiasm of the children (and that of their parents) is greatest at the start of the talent developing programme, and perhaps the parents want to avail themselves of all the development possibilities before the child shows definite commitment to one of the areas.

16.47% of the children have private lessons on Saturday, too (1.72 hours on average). Sunday seems to be a day of rest, because only 3.52% of the children have some developing lesson or activity on that day. Private lessons show the following priority: language lessons and communication are placed first, sports and dancing come second, mathematics is third, private music lessons and choir are fourth, and literature is fifth.

## Activities at home

We examined what kind of activities children do at home after a day at school. Freeman's (1985) research demonstrated that talented children tend to spend their free time, too, with activities that have to do with their special interest, enlarging their knowledge and honing their skills.

We have found that – from Monday through Thursday – preparation for the lessons at school is the main activity, which is followed by preparation for private lessons, with hobby and play lagging behind. Our results show that parents do not ask their children to do housework on weekdays, probably in order to lighten their

workload. On Friday and Saturday the situation changes; playing and hobbies are the main activities at home. Time spent with preparation for school and private lesson decreases, while time spent with housework increases. On Sunday, studying becomes the main activity again, closely followed by time spent with playing.

Time spent with different activities at home varies widely from one child to the next. Time spent with studying can, in some extreme cases, be as much as five hours.

### **Family background**

In most families there are two children, but in a considerable number of the cases there are three. 9.4% of the fathers do not live together with their children, although they are needed, after all “even though the mother has undoubtedly the dominant role, the influence of the father is also important in the development of the child” (Czeizel, 1997).

We find it encouraging that talented children in families with two or more children can participate in the available developing programmes in spite of the extra money and time they require.

We assumed that the more people there are in the family, the more they (older brothers or sisters, grandparents, other relatives) can share the task of looking after the child. Our findings did not bear out our assumption. According to the answers given to the questionnaire, 28% of the siblings helped (by accompanying the child to school and by studying together with him), while 93.3% of the grandparents did not help at all. Only one of the respondents mentioned that a grandmother lived with the family. Help by the grandparents, however, showed no correlation with the number of grandchildren.

Consequently, the parents have to manage on their own, because other members of the family or friends are even less likely to help.

### **Summary**

Talent development is a manifestation of a mentality which assigns high priority to knowledge, and which is willing to make investments with slow return. It was the practical, everyday aspects of this complex topic that we undertook to examine with the help of the pupils from three talent developing schools.

Our findings draw a picture of how talented children live, what their daily schedules and their family backgrounds are, how much time and money the families have to spend on developing the children who go to the talent developing primary schools of Eastern Hungary. Based on our study, we assume that the lives of the families and children we studied do not differ from those who do not go to talent developing schools, contrary to the general opinion, which holds that specific training is not conducive to healthy children's life. We will attempt to answer the above questions in our comparative study, which is under way.

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## The Role of Extracurricular Activities in Children's Life – with Special Attention to the Talented

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My study is devoted to the study of extracurricular education at school and outside school: the function of these activities in the life of children, their motives and drives when choosing these alternative solutions, and their characteristic features.

The names of these activities cause the first major difficulty since it is hard to find the common denominator for these school-type activities. To cope with the difficulties we create expressions like second education, second school, extracurricular activities, or shadow education, which all differ slightly from the originally implied meaning.

One thing is common, though, in these expressions: they all emphasise the role of these activities outside or *beyond the mandatory school education*, and also that they all imply a structured way of spending some time within a more or less *institutionally organised framework* of training and education. This is the point where regular outside school classes or activities and various enrichment programs organised for talented children overlap. Enrichment programs serve as a reliable basis for the assessment of the possible functions of extracurricular education and the motives of participation. Some experts (Feldhusen, 1986; Tannenbaum, 1986; Eylon, 1985) of extracurricular programs highlight the *self-selective* aspect of these activities outside the regular classes referring to the point that it is the child who makes his or her choice, therefore he/she is strongly involved. Secondly, this is a forum where they can meet *other kids with similar or the same interests*, which may help them to make a realistic judgement about their own abilities. It is also emphasized that the education outside the normal classes *makes room for creative productivity* through self-control and the lack of direct performance grading or marking.

In Hungary, 'talent development' programs mostly work within the school walls, characteristically retaining the old method of segregation (special classes, special schools, grammar schools with six or eight years of education besides the traditional four) with all the benefits and drawbacks. In order to eliminate the handicaps they merge the concept of segregation with the principle and practice of enrichment, but only within the school (such as individual and group differentiation, regular afternoon activities). However, even these schools consider the 'after school' activities the children's private matter.

## Our questions

1. What percentage of the children are involved in the educational ‘services’ shoved outside the curricula?
2. What characteristic features do the pupils who participate in extracurricular education (in and/or outside the school) have compared to those, who do not take part in such programs? Are they all talented?
3. The third question goes beyond the issues of psychological assessment and the measuring of the extent to which these kids differ from the others or exceed those who do not take part in extracurricular classes. We look at *the expectations and the motives underlying the decision to enter an extracurricular class, training, course or sport club and to take part regularly in an activity after the mandatory hours at school*. There is a large number of drives that might underlie the decision. The issue is even more exciting because on the basis of educational-sociological studies it seems that the ‘inclination’ to extend the limits of our brain to the extremes hinges on the cultural background more than on finances.

## Subjects

We researched on 548 pupils – 286 boys and 261 girls – from five schools in various cities between the age of 11 and 15. Some attended average classes, while some went to special ones (maths, sport, foreign language or special classes for the academically talented).

## Methods

We used a (1) Questionnaire to identify special classes and extracurricular classes, (2) a ‘Raven Progressive Matrices’ Test, (3) the ‘individual subscale’ of the Tennessee Self Concept Scale completed (4) with items about success attribution, (5) a particular query to map the motives of extracurricular activities, (6-7) the Kozéki-Entwistle Inventory of School Motivation and the Inventory of Study Orientation.

## Results

### 1. Percentage of pupils in extracurricular activities

In Table 1 we can see that nearly every child is involved in at least one (most of them in two or more) extracurricular activities after the regular teaching hours. Table 1 does not include those who have activities in the same category (e.g. somebody attends two programs in the school).

**TABLE 1**  
**The proportion of the extracurricular activities inside and outside school**

Extracurricular activity	N	%
Only outside school	83	15.1
Only inside school	154	28.1
Only private	15	2.7
None	37	6.8
Min. 2 activities	259	47.3
Total	548	100
sy has actout	296	54.0
sy has actin	397	72.4
sy has private	136	24.8

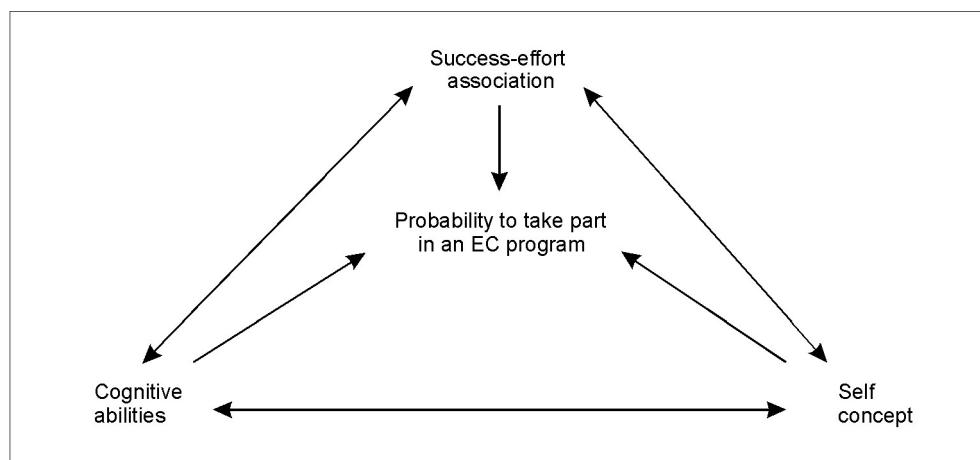
*actin*: extra inside school classes

*actout*: extra outside school classes

## 2. Characteristic features of the pupils taking part in EC

The results show that any decision made freely to take part in the extracurricular classes to develop some specific skills depends very much on *self-esteem*, on the *attribution of success*, which can be achieved and the *general cognitive abilities* (ANOVA,  $p<0.000$ ). Although the common or inherent aspects do not explain fully whether there is a causal relation, they are worthwhile reflecting upon (Figure 1).

**FIGURE 1**  
**Some characteristics, which can increase the probability of taking part in an extracurricular program**



This study also shows that the notions created about ourselves are largely determined by – not only the performance itself, but – the feedback we receive and other external factors.

The benefits of *teamwork* should also be considered. The individuals acting in a team outperform those outside the team in any measured dimension in the cases of outside school activities, which proves the existence of “team-surplus”. This might be attributed to the fact that when choosing outside school activities and groups for themselves, children are guided by their own initiatives.

**TABLE 2**  
Raven scores by type of extracurricular activity

	Inside school			Outside school		
	N	Mean	SD	N	Mean	SD
No extra activity	68	44.32	8.1	101	43.25	8.0
Individual	41	45.12	7.4	57	43.92	9.5
Group	100	43.95	8.7	50	45.20	6.4
Team	10	44.80	8.7	14	48.35	6.2
Mixed	45	46.95	5.4	42	47.85	6.1
Total	264	44.77	7.9	264	44.77	7.9

$F(4,259) = 1.198$ ;  $p < 0.31$

$F(4,259) = 3.550$ ,  $p < 0.008$

**TABLE 3**  
**Scores of individual self concept subscale (Tennessee Self Concept Scale) by type of extracurricular activity**

	Inside school			Outside school		
	N	Mean	SD	N	Mean	SD
No extra activity	68	70.23	6.6	101	70.48	7.4
Individual	41	72.26	6.8	57	73.01	7.5
Group	100	70.14	8.3	50	68.38	6.8
Team	10	75.80	7.7	14	73.85	7.6
Mixed	45	72.95	8.0	42	72.85	8.7
Total	264	71.18	7.7	264	71.18	7.7

$$F(4,259)=2,438; \quad p<0.048$$

$F(4,259)=3,694$ ,  $p<0.006$

**TABLE 4**  
Success-effort association index by type of extracurricular activity

	Inside school			Outside school		
	N	Mean	SD	N	Mean	SD
No extra activity	68	23.11	3.6	101	22.62	3.1
Individual	41	24.09	3.9	57	23.91	3.2
Group	100	23.12	2.7	50	23.78	3.0
Team	10	24.90	1.5	14	24.92	4.2
Mixed	45	23.68	3.2	42	23.83	3.2
Total	264	23.43	3.2	264	23.43	3.2

$$F(4,259)=1.384; \quad p<0.242$$

$$F(4,259)=2.955; \quad p<0.021$$

Some latest research (Ericsson, Tesch-Romer and Krampe, 1990; Ericsson, 1998) results suggest that outstanding performances owe little to the innate

nature of the individual. The exceptional level of performance has more to do with external factors. Today, researchers focus more on how devoted work, deliberate practice and motivation, which are required for such performance, can be maintained for a longer period of time. *Devotion* with the *necessary time* automatically assume certain factors of motivation and attitude, such as success (performance), the expended efforts and the assumed relation between the two. This is the point where the motivational and the cognitive notions overlap each other.

### 3. Motivation for working in EC

At this point we concentrated on the comparison of the motives behind mandatory and non-mandatory (extracurricular) activities. We used the Inventory of School Motivation (Kozéki-Entwistle) and the Inventory of Study Orientation containing 3-3 main dimensions and 10-10 subscales to study *school motivation* and *approaches to learning*.

Analysing pupils' answers relating to the choice among different extracurricular programs we create 4 motivational categories, which may be divided into 10 subcategories.

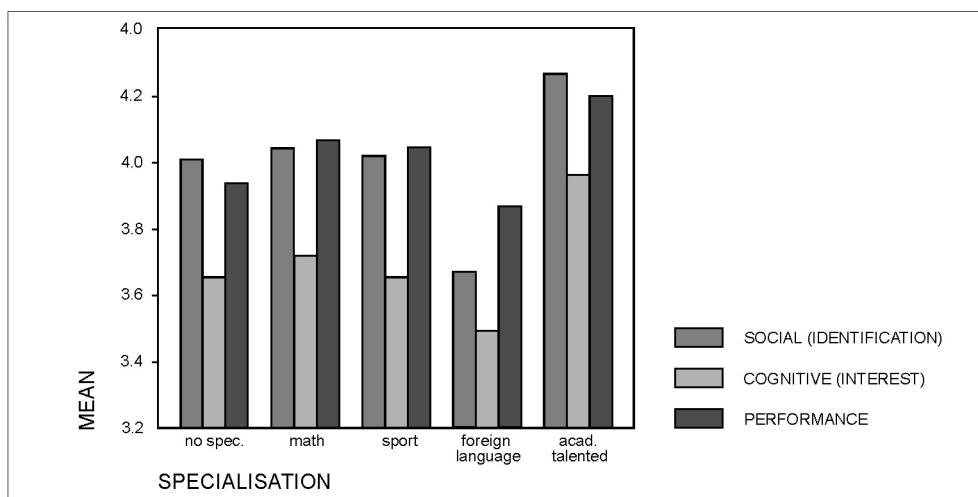
- I. Intrinsic motivational components
  - 1. Competence (need for acquisition of knowledge)
  - 2. Interest (responsiveness to novelty, experiencing adventure)
  - 3. Success (striking for excellence, overcoming oneself)
- II. Social motivational components
  - 4. Affiliation (need for belonging and pleasing others)
  - 5. Identification (need for being accepted, mainly by teachers and parents or other authority)
- III. Extrinsic motivational components
  - 6. Ego goals – striking for ideal self
  - 7. Extrinsic reward goals (working for rewards)
  - 8. Ego goals – need for power and competition
- IV. Other motivational components that are not connected with achievement
  - 9. Relaxation, recreation, amusement
  - 10. Other contextual aspects (such as pastime)

a) The school and the regular classes are not the forums, which allow for absorbed meditation or contemplative activities. Intrinsic motivation, however, predestines us for exactly that kind of thinking, since the source of joy is not rooted in achievement but in the process of discovery and the activity itself. The curricular context normally requires rapid and precise reactions, so the "more demanding" talents might as well underachieve.

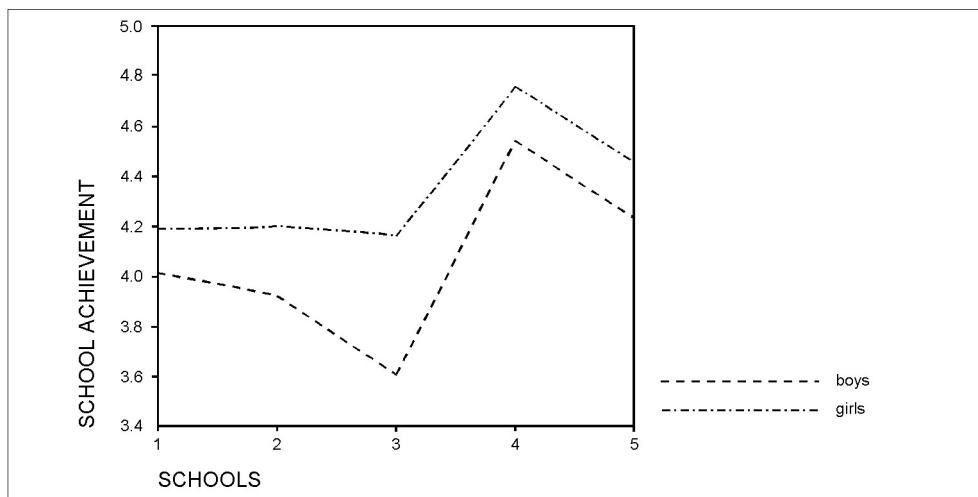
School achievement can mostly be predicted by the *performance motivation dimension* points (Figure 2), the *Raven* points ( $p < 0.000$ ; ANOVA) and the *sex* of the individual (Figure 3). On the other hand, extracurricular activities are mainly determined by *interest* among the possible motivational components (Figure 4). There are considerable differences, however, between various schools in terms of

'added value' (Figure 5) and motivation. The proportion of extracurricular lessons and their types (at school, outside school, private) correlate with school achievement and is in connection with different types of school motivation: the pupils who owe their outstanding results largely to private teachers are quite undermotivated at school and they only perform at the 'required level' (School 5).

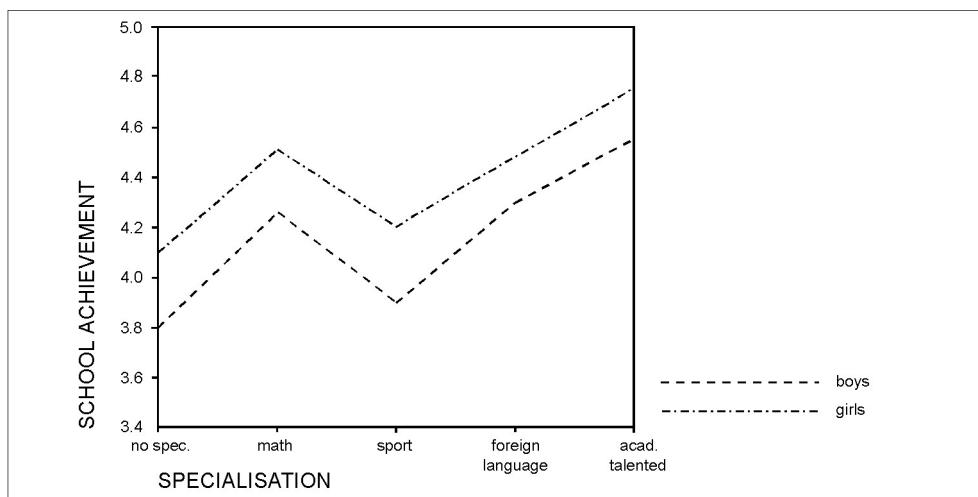
**FIGURE 2**  
The means of three dimensions of school motivation by specialisation



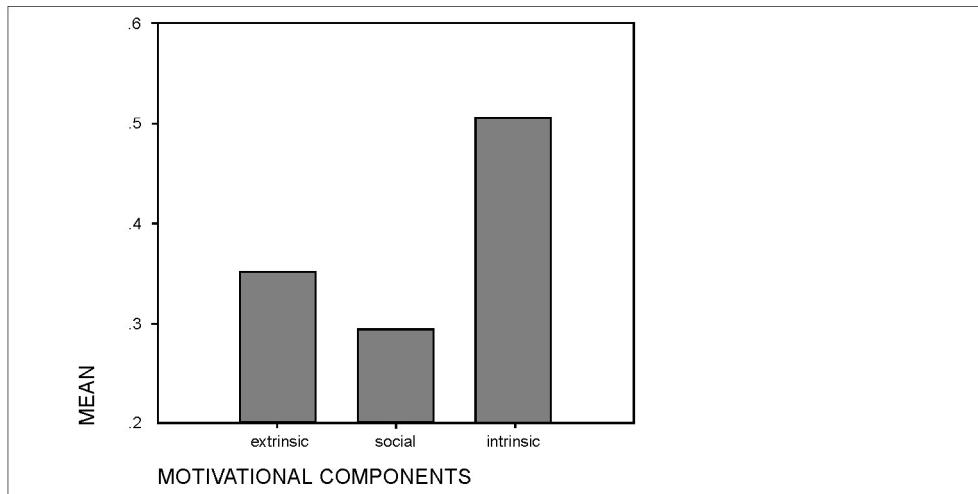
**FIGURE 3a**  
Boys' and girls' school achievement by schools



**FIGURE 3b**  
**Boys' and girls' school achievement by specialization**

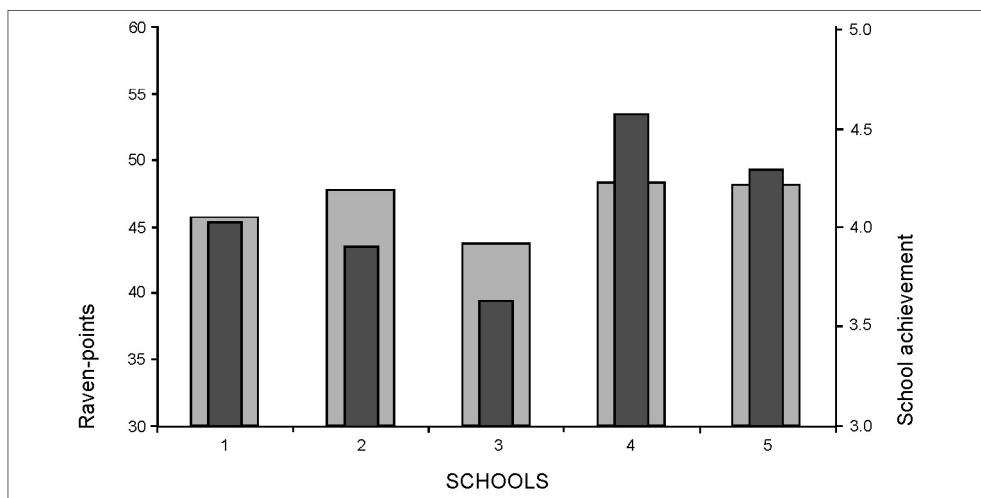


**FIGURE 4**  
**The means of the main motivational components of extracurricular activities**

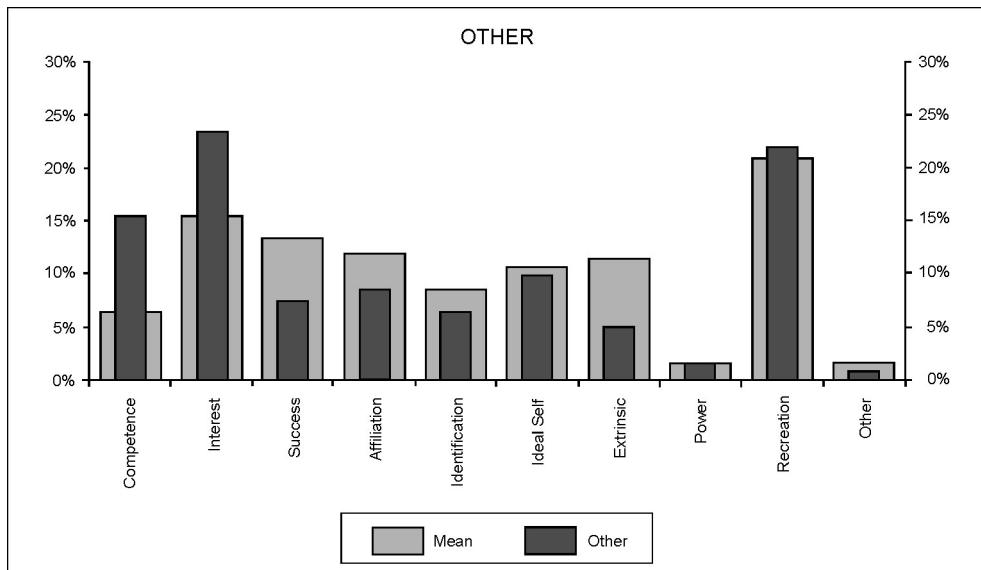


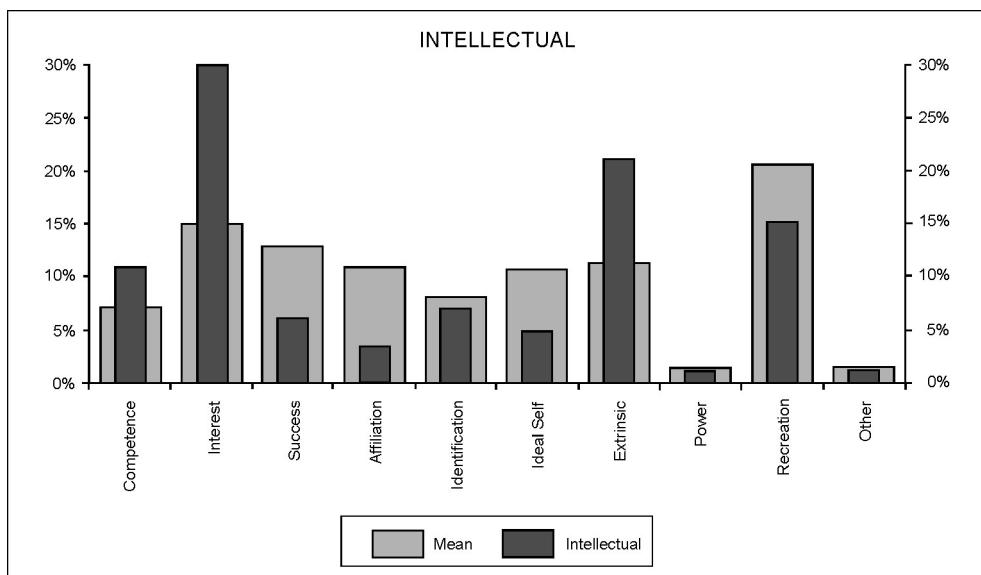
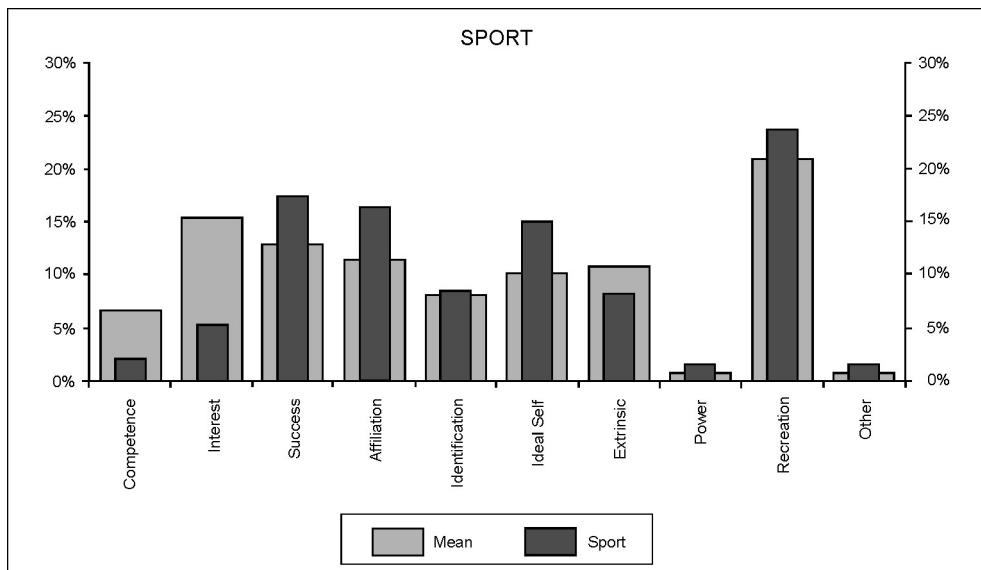
The analysis of these pupils – as a ‘by-product’ – confirmed the ‘raison d’être’ of talent development programs led by knowledgeable and prepared experts, provided the pupils at this school (School 4) achieved outstanding results on the basis of ‘value-added’ points. The good results, however, were also due to their own strong intrinsic motivation, especially to interest.

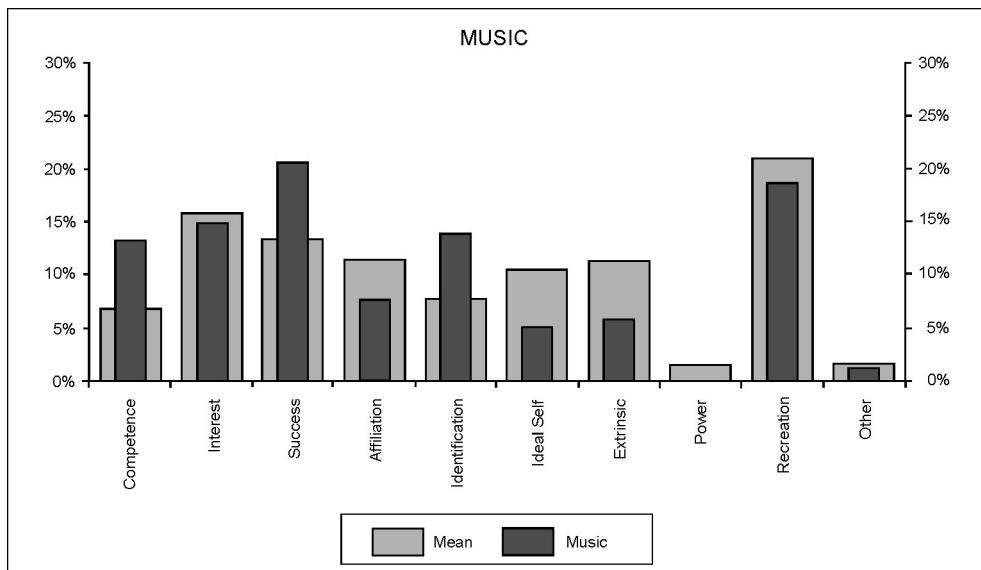
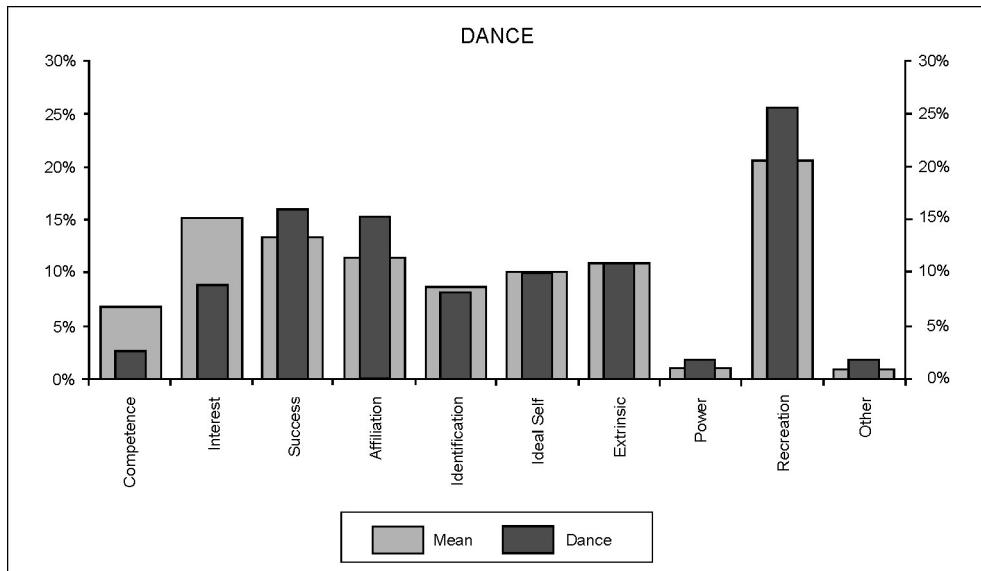
**FIGURE 5**  
**School achievement on the basis of Raven by schools**



**FIGURE 6**  
**The frequency of the different motivational aspects in the pupils' answers on the basis of EC programs they attend**







b) When analysing the motives of extracurricular activities we found that the different activities (music, sport, dance, intellectual, hobby) implied a diversity of incentives and, thus, allowed for the satisfaction of a wide range of motivations

(Figure 6a, 6b, 6c, 6d, 6e). So certain areas highlight diverse motivation profile contours, which can be linked to the given activities on the one hand, and to the involved individual on the other. The final decision of the issue will, however, be the subject of another investigation.

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# How Does the Concept of Enrichment Appear in School Workbooks?

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The educational system in Hungary has undergone considerable changes in the last few years. With these changes the teaching materials and programs had to be modified so that more attention should be paid to the development of abilities, problem solving skills and creative thinking, in harmony with enrichment programmes. As a result, a number of new textbooks have appeared in bookshops.

In my research I wanted to examine to what extent the new textbooks meet the requirements outlined above. I analysed Biology Workbooks for Classes 6 and 8, partly because workbooks provide good opportunities for individualisation, partly because some theories emphasize the importance of teaching materials in talent enrichment programmes. ('School's Council Curriculum Enrichment Project for Gifted Children in Primary Schools').

Before presenting the examination I would like to say some words about enrichment.

It is one of the most often mentioned concepts, as it is not only used in talent education. Its frequent use sometimes makes it difficult to grasp its meaning (Tóth, 1998). In my opinion, if we understand the aims involved in it, we will be able to identify the activities through which those aims can be realised.

The work of Sato & Johnson and Kaplan (Tóth, 1998) offers extremely useful information on the topic. If we examine how the theory is reflected in the questions and exercises of the workbooks, we can say that enrichment is probably best served with exercises that:

- make it possible for the learner to extend traditional learning experiences without getting overloaded,
- do not emphasize simple representative thinking,
- develop the ability of understanding and solving problems
- help the development of a critical attitude,
- help us learn about new phenomena and recognise new possibilities

## Review of the examination

I was interested to see whether the workbooks selected for the study are in harmony with the above and to what extent they help the teachers develop the pupils' abilities and personalities in average, rather than special talent nurturing classes.

I analysed the questions and the exercises in the workbooks to establish the rate between those that rely on the complex process of thinking and those that rely on its phases as “the nature of cognition involves the course it takes and the operations it uses.” (Kelemen, 1970)

Furthermore, I placed the questions and the exercises in a two-dimensional taxonomy system worked out by Báthory (1992) after Bloom on the basis of ability development in enrichment. This system shows us whether the development of ability or the widening of lexical knowledge is given more emphasis. I do not want to suggest that the exercises which do not aim at developing abilities are unnecessary, since there is no denying that factual knowledge is essential to understanding relations, too. Proportions, however, should be carefully considered and the accumulation of knowledge should not be overemphasised.

Questions involving the complex process of thinking or its phases are:

- I. Questions related to the content of thinking, called syllabus or lexical questions. Their sub-groups are directed at establishing facts, data, and attributes. The content requires mental images, representations of reality by the mind so that cognition can occur (Nagy, 1976).
- II. Questions requiring the psychological activities of thinking. Activities of *analysis, synthesis, generalization, specification, comparing*, etc. belong to this group.
- III. Questions requiring the formal operations of thinking, or the logical activity of thinking. The questions requiring *the definition of a term, listing, organising and drawing a conclusion* belong to this group.

## Results

The following tables show the percentile distribution of the main question categories and that of the sub-questions mentioned above in both workbooks.

**TABLE 1**  
**Distribution of main question categories**

Main question categories	Grade 6	Grade 8
Demanding lexical or syllabus content	31.08%	24.12%
Demanding psychological activity of thinking	14.97%	8.86%
Demanding logical activity of thinking	54.01%	66.99%

**TABLE 2**  
**Distribution of the sub-groups of the main questions I.**  
**Division of lexical and syllabus questions**

Question types	Grade 6	Grade 8
Fact-establishing questions	46.55%	30.61%
Data-establishing questions	5.17%	12.24%
Attribute-establishing questions	48.27%	57.14%

**TABLE 3**

**Distribution of the sub-groups of the main questions II.  
Division of questions demanding the psychological activity of thinking**

Question types	Grade 6	Grade 8
Comparison	25.00%	22.22%
Generalization-concretisation	3.57%	33.33%
Comparing	46.42%	16.66%
Completion	21.42%	27.77%
Analysis-synthesis	3.57%	—

**TABLE 4**

**Distribution of the sub-groups of the main questions III.  
Division of questions demanding the logical activity of thinking**

Question types	Grade 6	Grade 8
Defining a term	10.89%	25.00%
Demanding enumeration	6.93%	13.97%
Demanding organization	73.26%	52.20%
Demanding conclusion	8.91%	8.82%

The questions requiring organization and conclusion could be categorized in the following way (Table 5 and Table 6):

**TABLE 5**

**Division of questions demanding organization**

Question types	Grade 6	Grade 8
Order	12.16%	22.53%
Classification	—	5.63%
Grouping	50.00%	36.61%
Dividing	37.83%	35.21%

**TABLE 6**

**Division of questions demanding conclusion**

Question types	Grade 6	Grade 8
Causal	66.66%	58.33%
Reasoning	33.33%	16.66%
Expressing opinion	—	25.00%

It is really difficult to classify these types of questions according to the role they play in the development of abilities, as some types are highly complicated in terms of operations and because the development of operations is not independent of the content.

We can say that the questions about the content apply solely to facts, consequently they examine lexical knowledge.

In the case of the other categories operations may take different forms, e.g. the logical operation of ordering, which enhances the understanding of facts and concepts, may involve ordering, classification, grouping or division.

Exercises in the definition of a concept and those in listing demand understanding as well.

Some of the psychological activities, e.g. comparison, generalization, concretisation or completion can be considered as those involving adoption.

We consider exercises in causal reasoning, in drawing conclusions, in problem solving and in giving your own opinion the ones that demand high logical operations. Similarly, those requiring high psychological activities could be the ones involving analysis-synthesis.

## Summary

- The most important aspects of psychology were taken into consideration when the exercises and questions were compiled.
- The analysis revealed that there were few exercises involving problem solving, thus, there seems to be little room for operations that genuinely lead to development.
- I have found few constructive exercises demanding the expression of opinion and drawing a conclusion, most of them invite the learner to define a concept, although the characteristics of both age groups would allow more complicated tasks. If we consider the development of the cognitive structure, we can say that the exercises should rely on imagination as well as memory and thinking. It would have been easily realized in issues mentioned above, e.g. Grade 6: The protection of wildlife, or in Grade 8: Man's responsibility for Earth.
- Exercises involving the integration of subjects could have been applied more bravely. Topics would make it possible, e.g. Grade 6: The Wildlife of Hungary in geography, Grade 8: Cell – functioning in physics and chemistry.
- It would be interesting and challenging to expect the learner to ask questions about a certain phenomenon and it would certainly develop the ability to identify problems and to try and reach a solution by research.
- We all know about the developing effect of collective problem solving, but if we bear Renzulli's enrichment triad model in mind we realise that such exercises tend to develop children with average abilities and not the unusually gifted ones. In my opinion, the rate of exercises solved collectively and individually should also be modified, which would probably have a positive influence on both motivation and development.

In conclusion, we can say that the workbooks I examined contained the same exercises for all pupils, the principle that some exercises should be of primer character, while some others should have reinforcing or knowledge enriching function

was not observed. In my opinion, the exercises in the workbooks reflect the first two features.

In summary I can say that I did not find examples of in-depth and in-breadth forms of enrichment, but I found exercises which prove the presence of the concept and serve ability development. It would be worth considering how more exercises aiming at talent development could be included without violating the acquisition of facts. It is obvious that the large numbers of pupils in classes makes it very difficult for the teacher to compile exercises suitable to different abilities. It would be extremely helpful to provide them with a set of additional exercises for gifted children, which would ideally supplement the workbook used by the whole class.

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# The Role of the Exploration and Exploitation of Abilities in Child Psychiatry

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Our out-patient surgery is visited by children suffering from the most various disorders, among them headache, sleeping disorder, tic, enuresis, epilepsy, obsessive-compulsive disorder, depression, attention and behavior disorders, retardation, etc.

While the most frequent disorders used to be enuresis, anxiety disorder and epilepsy some years ago, now behavior has become the leading diagnostic category preceding anxiety disorders. Dysfunctions of abilities in school has changed from 5.1% (1988) to 9.6% (1998). According to the data in 1998 37% of the patients were treated for school problems (Károlyfalvi, 2000).

Considering (1) the common incidence of disorders (e.g. headache and behavior disorders), or their mutual influence (e.g. dyslexia and anxiety), (2) the strong interaction between society, family and school we realize that a complex approach should be used in therapy, in which the examination of the particular problem (e.g. learning problem) is only one factor.

A past, present and future oriented approach can be applied frequently in therapy. These three time dimensions should taken into consideration to different degree depending on the problem and the phase of the therapy.

Past orientation means the exploration and correction of possible early injuries and inappropriate behaviors stemming from past experiences. Present orientation includes (1) the treatment of that particular problem (e.g. searching for a learning strategy in the case of learning problems), (2) looking for an activity providing self-confidence, success in performance and satisfaction, and (3) finding a supporting group. Future orientation includes the determination of short term and long term aims and revealing the meaning of certain phenomena. The exploration of talent plays an important role in therapy because it helps to find activities providing self-confidence, success in performance and energy to determine aims. Thus the self becomes stronger and able easily to cope with the shadows of the past, which, in turn, leads to the release of energy. This energy can be channelled into activities previously mentioned.

According to this approach, the most important task is the exploration and exploitation of abilities and the prevention of running to waste. Talent is a prominent, distinguished ability. Here, the concept of ability will be used because it does not emphasize the deviation from the normal so strongly. The more prominent the ability is, the more likely it is that the activity will be successful.

A 14 year-old boy suffering from behavior disorders attempted suicide and was sent to the Psychiatry Ambulance. He was withdrawn, hopeless with depressive marks. He lost interest in all activities and did not take pleasure in anything; he was bored, he did not want to learn, and he did not see the meaning of his life. He was sent to hospital after using alcohol, cigarette and drugs. His father had done his utmost so that his son would never be born. He had beaten his mother so that she should abort. He had died soon after his son's birth. The son had frustrated many love relationships of his mother's. It had led to much tension between them. His mother – who had a pessimistic, weak-nerved, hypochondriac character – was under psychiatric treatment as well. They came with the boy's stepfather, who was the only man he accepted. He tried to encourage him to learn, to go in for some sport, but he failed to remove him from nihilism, although the boy only accepted his advice. At the beginning of our conversation it turned out that he was rather withdrawn, denying all his problems and refusing to explore them. Playing football was the only thing he was interested in. He had wanted to join a club but he had been turned down because he was not found talented enough. We managed to find a club where the main aim was not to train leading sportsmen. He did not seem to be talented as he had rarely played football. Though at first he was not taken into the team, he was allowed to go to training. He was enthusiastic about football and he did not miss a single training. He cut down on cigarettes in order to be more successful. He lost some kilos and became athletic-looking in some months. By the end of the season he had joined the team.

When we met after the first training he seemed to be a different person. His looks and temper were more lively and open, and he was ready to participate in private conversations and family therapy. This was the only ability in his structure of abilities by the means of which he was able to get out of a crisis and to win energy for his further life.

What can help to recognize abilities that support the development and the health of the individual in psychiatry?

Some interests or special subjects the individual is interested or talented in may already appear during the exploration or interview. But in many cases children are not interested in anything at all and they consider themselves as untalented as their parents do.

There are numerous diagnostic and therapeutic means in child psychology that may be appropriate for spotting prominent abilities.

It is common for children with learning problems to have high or very high scores on intelligence tests. Tests measuring special abilities such as MAWI (the Hungarian version of Wechsler's Intelligence Scale for Children) highlight poor as well as outstanding performance, which helps the therapist to find activities where those skills can be exploited.

A 13 year-old boy was in Class 5 because of his illness and his teachers thought that he had special educational needs. He was sent to the Ambulance, on his teachers' advice, because of stealing and behavior disorder. He scored only 70 on the verbal scale of MAWI; he obtained the lowest scores on the items of general knowledge. This result explains the opinion of the teachers, and may even suggest special educational needs. However, he scored 130 on the performance scale, thus

his IQ was 100. He planned to work as a builder or a printer in the future. His abilities concerning these trades were confirmed by his structures of a high standard in World Play (a projective test for children). Any psychopathological disorder can be prevented if we improve deficient abilities and find activities in which the child's abilities can be exploited.

The administration of intelligence tests and the interaction while the test is being administered can give us information about the most important abilities of the person and about the factors that interfere with their development (e.g. low self-esteem, anxiety for achievement).

Among these tests, projective tests can be highly informative as well. World Play, the drawing of the family, CAT (Children's Apperception Test), TAT (Thematic Apperception Test), Rorschach Test and other methods can inform us about interests, creativity, sense of art and outstanding abilities.

An 11 year-old boy delineated everybody as a heron on his drawing of his enchanted family. It turned out from our later conversation that he was interested in birds, he liked reading about them and was immersed in this topic. He was referred to the Psychiatry Ambulance because of behavior disorders and vagrancy. We supposed that there was alienation between his parents and an estrangement within the family in the background of the problem. In family therapy we suggested that they should have family programs and outings to e.g. a certain National Park, which is rich in different bird species. Another possibility outlined for the boy was to enrol in a course where he could learn about the protection of birds, thus, (1) he could specialize in his favourite topic, (2) he would be in company, (3) he could channel his superfluous energies into socially accepted activities and improve his skills that might be useful later in his choice of profession.

Stories stemming from the projective tests often reveal creativity and vivid imagination. They help us stimulate repressed imagination and the stories often provide the children with the tool for self-help. Many young people keep a diary, write poems, tales and "novels". However, nowadays the passive activities of watching TV and playing video games overshadow the active processes of reading and writing. Thus, children cannot benefit from their developing imagination, they do not gain knowledge from reading. Consequently, besides playing an important role in diagnosis, projective tests can effectively be used for developing the imagination. A 12 year-old boy was sent to our Ambulance with learning and behavior problems. His mother brought him up alone. When we first met he was shyly hiding his hand, which was injured from his birth. During our conversations it turned out that he did not like reading, he regarded tales infantile and he usually spent his time with his friend using a computer. On his drawing of his enchanted family he delineated his mother as a flower, himself as a giant, their dog as a dragon. He told the following story on the basis of his drawing: The dragon steals the giant's flower, because he considers it as a miraculous flower that gives eternal life. The giant defeats the dragon and gets back the flower.

Next time I read him the tale of John, the hero. It is about a widow who sends away his son, John, because they are so poor that they cannot make ends meet. John stands tests, defeats the king of dragons, marries a princess and takes his

mother to his kingdom and they live happily ever after. This boy – who didn't like tales hung upon my words. This time, his uncommunicative and rather cynical behavior came to an end.

We can get more information about special abilities from simple explorative plays in the playing room as well. For example, Romany children are often interested in music. They frequently choose to play the xylophone or other musical instruments. This interest is exploited in Mihály Fazekas Primary School in Debrecen.

*Summary.* In clinical work it is very important to explore and exploit abilities that can help people to pursue a healthy way of life. Outside the clinical practice, it would be extremely useful to develop methods or programmes that would help children to scout their special abilities and identify their interests so that they could reap the benefits in their life.

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# Talents in Religion

BALÁZS MOLNÁR

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## I.

Religion is one of the most important parts of human existence. It is a universal phenomenon, its mark is recognizable in every culture. Religion equally affects social structures and individual existence. The object of religious experiences can be questioned, but not their existence. In addition, the outstanding personalities in religion have historical importance, they have powerfully influenced the development of humankind. Therefore, the scientific investigation of religious phenomena is important and more and more accepted by psychology. Thus, it is a just claim to do research in this field from the point of view of talent investigation.

Many people have had religious experience. But who are considered to be ‘talents’ among them?

- a) From an *individual aspect*, those with more intense religious experience, which is above average, but still not pathological.
- b) From a *sociological aspect*, those, who are – either potentially or in a manifest way – able to make outstanding achievements through their religious experiences.

The two types are not independent of each other. For instance, more intense religious experiences in Christianity may motivate certain activities in society.

Talent can appear on three levels in relation to religion (as an independent entity) and to the individual:

- The founder of a religion
- The reformer of a religion
- An outstanding follower (of a religion or a religious personality)

We cannot draw strict borderlines between the levels. Partly because one person can be active on more than one levels (for instance, an outstanding follower may enrich his religion with new ideas) and partly because there are problems with some definitions (e.g. Where is the dividing line between a new and a reformed religion?)

Apart from these conceptual uncertainties there are some factors, which make the research of talents in religion difficult.

From the *ideological point of view* it can cause problems that religion and science (involved in psychology) do not always tolerate each other. They often intend to expose rather than to understand each other. This kind of relationship can lead to further anxiety, misunderstanding and distance.

From the *aspect of methodology* it can cause difficulties that investigation in this field often demands an interdisciplinary approach (psychology, theology, soci-

ology, etc.), in addition, there are problems in measuring this phenomenon in many cases.

## II.

Despite the difficulties there are several alternative possibilities to do more or less objective research – even draw some important conclusions in the field of talent-development. In accordance with these presumptions, for a detailed analysis I chose twelve Catholic saints who lived in the nineteenth and twentieth centuries and considering the obtained data I tried to draw generally valid conclusions.

Obviously, the restricted scope of the sample studied (Catholic saints) sets limits to the validity of the conclusions but the principal results can be illuminating.

There were practical reasons for choosing 12 Catholic saints:

- Catholicism has always been a significant and powerful tendency.
- Canonized saints make a well-defined circle – although we can speak about Catholic talents outside this circle, as well.
- The explanation for the restriction to these two centuries is that this period is rich in written sources and the socio-cultural influences, which led to the emergence of these talents, are more similar to the influences in our age than those in previous centuries.

The 12 chosen Catholic saints are the following:

1. Saint Anthony Mary Claret (1807-1870)
2. Saint Bernadette Soubirous (1844-1879)
3. Saint Dominic Savio (1842-1857)
4. Saint Frances Xavier Cabrini (1850-1917)
5. Saint Gemma Galgani (1878-1903)
6. Saint John Bosco (1815-1888)
7. Saint John Vianney (1786-1859)
8. Saint Catherine Labouré (1806-1876)
9. Saint Maria Goretti (1890-1902)
10. Saint Maximilian Mary Kolbe (1894-1941)
11. Pope Saint Pius X (1835-1914)
12. Saint Therese of Liseaux (1873-1897)

All of these 12 Catholic saints were ‘outstanding followers’.

## III.

The interpretation and categorization of biographical data is problematic occasionally, which makes analysis more difficult. However, tendencies can clearly be recognized. The most important ones are the following:

### 1. Characteristic qualities, abilities

*Strong self-consciousness* and *strong task-consciousness* mark all the saints researched. They were aware of who they were and what they had to do. They

were able to preserve their calling and awareness even in difficult, hostile circumstances.

At least in the case of 9 people a *high ability for hermeneutics* can be proved. They were sensitive to perceiving hidden indications, they were able to interpret dreams, visions, signs and biblical texts with deep meaning.

Most of them had *good communicative skills* in written or oral form, for instance they had good abilities to convince others.

## **2. Facts that are of less importance**

There are some features, abilities, which do not seem to have a significant role in developing talents in religion. Talent is not closely related to *gender*: both men and women can become saints.

*Age* is not of great importance either. Teenagers can be saints, too, by martyrdom – for instance Saint Maria Goretti died at the age of 12, and even without martyrdom one can become saint at an early age: Saint Dominic was less than 15 years old when he died.

There is a wide range of *physical abilities* in the research of these talents. Both physically strong (e.g. Saint John Bosco) and weak, sickly (e.g. Saint Gemma) people can be found among them.

It may be strange that no close connection can be proved between talent and *cognitive abilities* (primarily intelligence). Weak abilities can be obstacles but they are not excluding factors – for instance Saint John Vianney and Saint Bernadette had definitely low cognitive abilities. Nevertheless, high cognitive abilities are more typical – in the biography of at least 7 out of 12 saints indications for this can be found.

## **3. Family background and childhood**

By the 19-20 centuries there have been only a few ‘converted sinners’ among the saints. Most of the saints were greatly interested in religion from their childhood – all of the 12 Catholic saints belong to this group. Usually, their deeply religious family-background formed the basis.

It is worth mentioning that only 2 out of the 12 saints came from wealthy families, poverty was a more characteristic feature among them.

## **4. Achievements on social level**

The intensive, individual religious experiences are usually connected to activities on social level. The most important social achievements of the investigated saints can be divided into three main groups:

- the establishment, organisation and management of institutions, organisations and movements
- publication
- the effective shaping of public awareness (conversion, preaching, supporting, education)

### 5. Dangers and difficulties

Certain, common risks are involved in the life of the 12 investigated saints. Overstrictness with himself/herself and others can often cause problems. It can be manifested in the exertion and ignorance of a poor physique.

How to react appropriately and how to handle these aspects may be of importance for talents of other types, as well.

Even on the basis of this limited research, some important conclusions can be drawn, which may be used in talent development and in defining its tasks. It can be pointed out that talent in religion can also be recognized at an early age. The essential task of development is to have this talent and interest manifested in constructive activities, which are useful for society (suitable motivation and possibilities for practising communal activities). Talents in religion have to be ready to cope with difficulties (c.f. point 5) – and to develop their coping strategies. In this way, it is more likely that a mature talent not an unstable personality will develop.

### Additional comments

On the ECHA Conference in Debrecen I was involved in numerous interesting and valuable discussions. Many important questions arose (in connection with this topic), which might have occurred to the reader of this study, as well. Finally, I would like to introduce some of these questions:

*1. The expression ‘talent in religion’ seems to be a strange, unusual term. Can we use the concept ‘talent’ referring to the spiritual sphere?*

We are all different, therefore, there must be more and less talented people in all spheres of human existence. Why would religion be an exception? Although the concept ‘talent’ can be disputed, the phenomenon exists.

*2. Is it necessary to develop and support talents in religion? Whose task is it?*

I suppose that in church and in other ecclesiastical institutions it is not questioned. It should be considered as a priority in secular institutions, as well, the development of talents is essential for society and for the development of the personality of the individual – talent in religion can also be manifested in the same way.

*3. Does religion have any future in 21<sup>st</sup> century?*

The form and content of religions are changing but faith seems to be a strong need. According to many philosophers it is a basic feature of human existence. I doubt that serious changes will occur in this field.

# “Gifted Education Expert” – Course in Hungary

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In September 1997 a new postgraduate program has been launched at the University of Debrecen. In our report we are going to give an account of the antecedents, of the program itself and of our experiences so far.

## Objective of the training, national and international background

### 1. Objective

Objective of the training is to train experts with a graduate teacher's degree (a) so that they be competent in solving specific practical tasks involved in talent development, (b) so that they make good use of their competence in public education (schools, student hostels, other educational institutions) on the one hand, and in specific institutions (in educational counselling and career's advisory service, family protection advisory centres and cultural institutions) on the other hand.

### 2. The program's Hungarian topicality, its antecedents

In Hungary teachers are not trained specifically to fulfil specific developing tasks within the framework of their basic graduate training. However, recently talent development has come to the spotlight of professional interest in our country, too. The reasons for this are the following:

- Social changes have enhanced the need for achievement-orientedness in all fields of life. Identification and development of the abilities and of talents is a prerequisite of high achievement attained both by the individual and by the country.
- Changes in the school-system (launching 6-8-class secondary schools) have increased the interest in talent nurture. Besides, schools have been trying to create their individual image in the competition to recruit children. Offering various forms of talent development proves to be an efficient means for it. The recently approved National Curriculum requires schools to make their own curriculum, which ensure large possibilities to incorporate talent development programs.
- The economic polarisation of our society – more specifically the increase in the number of those belonging to the poorer layers – has put an even greater responsibility on schools and experts in the field of talent nurturing. It is necessary to work out forms of intensive individual development for children from backgrounds with various difficulties.

However, the training of teachers is not in harmony with the challenges mentioned above: a teacher in his or her basic training does not obtain suitable knowledge for the identification and intensive development of high ability. Of course, many schools have a tradition of talent development programs and they do achieve great success, however, very little of the results of domestic and foreign research is incorporated in this work. The demand for more accurate knowledge from those involved in this work has been existing for years now, however, there has been only partial solutions to meet this need. The Department of Educational Psychology of University of Debrecen in cooperation with the Institute of Psychology of the Hungarian Academy of Arts and Sciences (in organization of the Ministry of Culture and Education) has given a 120-lessons of intensive further training programs in the early 90-ies – an unparalleled initiative in the country. However, this form of training can only partially satisfy the current demands: due to the time limit, it does not offer the participants reliable reference neither in theory nor in practice.

The Institute of Psychology of University of Debrecen has a close cooperation with the Psychological Institute of the Hungarian Academy in the field of talent research. This latter institute has been involved in intensive research of talent nurturing since beginning of the 1980-ies. In 1985 a team was formed at the request of the Ministry of Education to collect the results of the research carried out up to that time and to provide counselling for the education (*Talent nurture in school*, ed. Jenő Ranschburg, Tankönyvkiadó, Budapest, p 463). A follow-up study of the early identification of intellectual talent was supported by the National Research Fund in 1986 and 1990. Consultants: Mrs Kürti, Éva Gefterth, Mária Herskovits. The identification of abilities is closely complemented by an examination of the image teachers have about the concept of talent. The Psychological Institute of the Academy aims to take part in the planned post-graduate training, following its participation in the intensive further training for teachers.

The Institute of Psychology of University of Debrecen has a 10-year tradition of talent research. As a result of this tradition, one of the sub-topic in the PhD program of the Institute is talent nurture. (At present there are more than 15 PhD students who do their theses and research in this field.) During the last several couple of years, several papers have been published, integrating Hungarian and international research results. *The basics of talent development*, 1993; *Talent and personality*, 1994; *Talent and abilities*, 1995; all three volumes were edited by László Balogh, László Tóth, Mária Herskovits. These publications were prepared for the intensive further training for teachers. Lecturers of the Department of Educational Psychology regularly make reports on their scientific findings at national and international conferences on talent development. They have delivered more than 10 lectures at international meetings since the late 80's (Zurich, Budapest, Munich, Nijmegen, Columbus – State Ohio, US). Several studies by our lecturers have appeared in foreign journals and compilations.

In 1994 the first Talent Nurturing Centre was formed within the framework of the Budapest Pedagogical Institute, which plays a key role in solving problems concerning the issue of talent nurture in Hungary – by collecting personal infor-

mation, offering programs of development and individual counselling. The Institute of Psychology of University of Debrecen stays in active cooperation with this centre too. As for the future, the two institutes have outlined possibilities for further development. In the postgraduate program this site is given prior significance in the practical training.

### **3. International background**

The second half of the 80's saw talent nurturing come to the spotlight of interest. Since the Hamburg Congress (1985) of the World Council for High Ability (WCHA) and the formation of the European Council for High Ability (ECHA) in 1987, Hungarian experts have been taking an active part in diverse forms of international cooperation. A sign of recognition of the results of Hungarian research of high ability, ECHA has had a Hungarian member of its executive board for years: earlier Éva Gefferth, at present Mária Herskovits (Institute of Psychology, Hungarian Academy of Sciences). László Balogh, senior lecturer at University of Debrecen is a member of the four-member Diploma Committee of ECHA.

ECHA and WCHA build an international network that promotes the exchange of information concerning research, teacher training, postgraduate training, development, counselling, and other services in the field of high ability. In order to raise the standard of talent development, ECHA has drawn up a postgraduate program for teachers. The ECHA Diploma was founded at the University of Nijmegen, the Netherlands, 1994. Expert of their high ability research institute are conducting and guiding the training. Director of the Institute in Nijmegen and current chairman of the ECHA, Prof. F. J. Mönks agreed to the application of this program in Hungary and also offered his help to realise the training there.

Since the very beginning, the Department of Educational Psychology of University of Debrecen and the Institute of Psychology of the Hungarian Academy of Arts and Sciences have been contributing to the more and more intensive work in talent research and development: our researchers and lecturers regularly give lectures at the ECHA conferences held every two years (Zurich, Budapest, Munich, Nijmegen). Beside these conferences, they have also had other opportunities for exchange of experience: the experts of both institutes have participated in several study-trips abroad to study talent nurture. Last year lecturers of the Department of Educational Psychology made visits to the Netherlands and the USA with the aim of studying topical problems in the field of talent development. F. J. Mönks and Prof. Welsh delivered lectures in Hungary as guests of University of Debrecen and studied the work at the Department. Prof. Welsh came to Hungary as Chairman of the English Society for Talent Nurture.

### **Requirements of qualification**

- 1. Specification of the program:** specialisation for teachers of talent development
- 2. Attainable level of qualification:** university-level postgraduate further training

**3. Qualification stated in the degree:** “talent-developing teacher”

**4. Requirements of admission:** oral interview based on literature

**5. Time of training:** 4 semesters, a minimum of 625 lessons

**6. Content of the program, fields of studies:**

Competences necessary for pedagogical work are a prerequisite of the program, thus the focus in the training is put on problems of talent development. General fields of knowledge of educational activities are discussed only with the aim of relating the new information to the basics. By adopting similar programs used in other, more developed countries in Europe, the program aims to cover the following major fields:

- Theoretical background: history of talent development, talent and society, an up-to-date concept of high ability, its components and kinds
- Methodology and development: identification of talent, talent-developing programs, counselling and individual development, the role of the teacher in the development, underachievement, and learning disorders
- Special fields: provide a theoretical background in the fields of social pedagogy, curriculum development, mental hygiene and organisational development – for pedagogical and managerial activity relevant to talent development

The theoretical training is complemented by external on-site training, 165 hours altogether. This practical part serves as base for the candidate's course paper. The theoretical part amounts to 34% of the training period, internal and external practices add up to 66%. The list of the courses is enclosed in the appendix “Curriculum”.

**7. Control, assessment, requirements:**

Forms of examination: oral exam, end-term note, end-term exam, and final paper. The required number of credits (oral exams and end-term notes) is 20. It is impossible to estimate exactly the distribution between these two forms as it changes individually according to the chosen courses.

Students have to pass comprehensive (two-course unit) exams. At the end of the second semester, they are supposed to take an exam in the psychological and pedagogical basics of talent development, at the end of the fourth semester in the application of the developing programs.

*Requirements of the final examination:*

- The candidate defends his final paper and
- proves his methodological skills in talent identification, counselling and individual development.

The final exam takes place before a board of examiners: a condition to sit for this exam is that the candidate has successfully completed all the required studies and handed in the assessed documents of his or her final paper.

The topic of final paper is a free choice in the field of talent development, in an empirical and in a theoretical elaboration. The student's work is supervised by his/her consultant. Minimum number of pages: 40, maximum: 100. On completion, the paper is corrected, assessed and graded by the consulting lecturer.

The final grade of the degree is calculated on the mean of the grades of the comprehensive exams, the final paper and the final exam.

### **Our experiences so far**

As we have mentioned before, the first form has been launched in September 1997 and the next one follows in September 1998. The number of candidates show that the training is very popular: the first year started with 93 teachers, the second with 78. The participants are in pre-schools, in primary and secondary schools. It is interesting to see that most of them already possess significant experience in teaching (they have spent 10-15 years teaching). In most of the schools where they work there is already a program for talent development. It is in the course of these programs that they faced practical programs of talent nurture and it was these problems which motivated them to participate in the further training.

They participate in the training with enthusiasm and great interest in spite of the fact that the lessons are usually held on Saturdays. What especially excited the participants were the practical tasks (analysis of experience in other institutions of talent nurture). These occasions were first held in the second term, and their number will increase in the third and fourth terms. We think that these practical tasks and the experience acquired in other workshops of talent development facilitate the efficacy of the training.

The lectures of the training are not exclusively lecturers of our university. The most part of the courses are held by lecturers of the Department of Educational Psychology, but there are several well-known experts coming from other institutions who give lecture courses as well. From the Institute of Psychology of the Hungarian Academy of Arts and Sciences: senior experts Mária Herskovits, Éva Gyarmathy, István Koncz. From the Eötvös University of Arts and Sciences, Budapest: Prof. Mrs Pál Ritoók and Prof. Magda Kalmár. Courses are given by Endre Czeizel, professor of medico-genetics, President of the Hungarian Association for Talent Development. Last year, we had foreign lecturers as well, who gave consultations: Prof. Mönks, President of ECHA; Paul Roeders and Éva Gefferth, former chair members of ECHA and working in South-America at present. We also aim at establishing the requirements for receiving the ECHA Diploma – the obstacles are of material nature.

After all we consider the job that we made during the years of preparation as successful. This is shown in the fact that the Hungarian Accreditation Committee has unanimously accepted our training program – without any modification. The efficacy of the program obviously depends on the mode of execution. We do our best so that our students get the most up-to-date information and practical knowledge about talent development. We work with the latest literature. Recently there has been three books (by Mönks, Landau and Roeders) published in Hun-

garian, and due to our cooperation with the Talent research Centre of the University of Nijmegen, we can also gather personal experience about the developments. Participation at international conferences is another efficient source of acquiring up-to-date information: there are more than 10 lecturers and 3 students participating in the program who are here with us in Oxford. Everyone participates in giving lectures as well. We are very grateful to the president of ECHA and to local organisers for supplying us these convenient conditions. We will continue our work in Hungary enriched by the inspirations that we gathered here. We hope to see lots of foreign experts again in the year 2000 in Debrecen, at the 7<sup>th</sup> ECHA Conference, where they will have the opportunity to have a closer look at our teacher-training program. All of you, you are welcome in Hungary.

**APPENDIX 1**  
**Program description of the training “Gifted education expert”**

Course	1 <sup>st</sup> term		2 <sup>nd</sup> term		3 <sup>rd</sup> term		4 <sup>th</sup> term		Form of assessment				
	L	S	L	S	L	S	L	S	SE	CG	CE	FE	
<b>I. Theoretical introduction</b>													
1. History of research and nurture of high ability	20	-								1			
2. Definitions and sorts of talent	20	-								1	2		
3. Components of high ability	20	-	20	-						1	2		
4. Talent and society	20	-								1			
5. Talent and socio-emotional development		20	-								2		
6. Creativity, pedagogical implications		10	20*								2		
<b>II. Methodology and development</b>													
1. Diagnosis of talent	10	10	10	10					2	3	4		
2. Talent development programs			10	10	-	10			3	4	4		
3. Methodology of enriching programs			10	10	-	10			4	4			
4. Underachievement, learning disorders			10	10					3	4			
5. Counselling, individual development			10	10	10	10			3	4	4		
6. The role of the teacher in talent development	-	20*					10	20*			4		
7. Seminar for final paper					-	10	-	10		3	4		
<b>III. Specialisation (optional, 90 hours, 1 obligatory course)</b>													
1. Mental hygiene in schools													
2. Organisation development													
3. Educational system analysis (list of courses: see Appendix 2)													
Obligatory:	80	20	60	30	40	50	30	60	4	10	2	1	
(210 lecture courses, 160 seminars)													
Optional: minimum 90 hours;			Depends on the choice of specialisation										
External training: 165 hours	-		30		75		60						
(15 hours to each assigned course)													

Abbreviations: L – Lecture, S – Seminar, SE – Simple Examination, CG – Course Grade, CE – Comprehensive Exam, FE – Final Exam

**APPENDIX 2**  
**Course list of specialisation**

<b>Course</b>	<b>1<sup>st</sup> term</b>		<b>2<sup>nd</sup> term</b>		<b>3<sup>rd</sup> term</b>		<b>4<sup>th</sup> term</b>		<b>Form of assessment</b>				
	L	S	L	S	L	S	L	S	SE	CG	CE	FE	
<b>A. Mental hygiene in schools</b>													
1. Socialisation					15	–			3				
2. Social disorders					20	–			3				
3. Development of deviant personality					10	–			3				
4. Mental hygiene					10	–		15	3	4			
5. Foundations of a supporting relationship							20	–	4				
<b>B. Organisation development</b>													
1. Descriptive organisational analysis	10	10							3				
2. Introduction into decision theory					20	–			4				
3. School management	10	–			10	–			3	4			
4. Psychology of management					10	10			4				
5. Conflict analysis	–	10							3				
<b>C. Educational system analysis</b>													
1. Educational sociology	10	10							3				
2. Educational systems at the turn of 20 <sup>th</sup> century	10	10							3				
3. Sociology of being a teacher					10	10			4				
4. School structure and function	–	10			10	–			4	3			
5. Economical, political factors in public education					10	–			4				

Abbreviations: L – Lecture, S – Seminar, SE – Simple Examination, CG – Course Grade, CE – Comprehensive Exam, FE – Final Exam

[Paper presented at the 6<sup>th</sup> Conference of ECHA, Oxford, 18-21 Sept 1998]

