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The Quality of Deductive Reasoning in Inferring Words from Context: Comparison of the Performance of Standard and Talented 9–10 Year Old Pupils

Introduction

In this paper we present an example of interdisciplinary research using expertise in four academic fields with the purpose of the *implementation of cognitive approaches in education* in order to restructure the teacher-training curriculum. Since 2012, this research project has been supported by the Agency for the Promotion of Research and Development at the Slovak Ministry of Education[1] (APVV MŠ SR). The research is orientated towards the diagnostics and stimulation of the cognitive and executive functions of primary school pupils (ISCED 1) and the research team is made up of 14 experts from two Slovak universities.
Research aims include the following:

1. Exploring the possibilities of a child's cognitive performance assessment;
2. Studying the executive and cognitive functions of a child in relation to the ability to learn;

[1] This work was supported by the Slovak Research and Development Agency under the contract *No. APVV-0281-11: Executive functions as a structural component of ability to learn: diagnostics and stimulation, project leader Iveta Kovalčiková, University of Prešov, Slovak Republic.*

3. Defining and specifying the underlying processes that affect cognitive performance;
4. Creating a cognitive and executive profile of gifted children;
5. Identifying the peculiarities of executive functioning in children from socially disadvantaged environments;
6. Analysing how to prescribe the remediation of deficient cognitive functions.

In the paper we present and analyze the partial data from the above research. Our attention is directed to the analysis of the differences between the selected cognitive characteristics of pupils 1. educated in standard school conditions, and 2. pupils categorized as talented who are educated in special classes for talented pupils. We focus on the following cognitive characteristics of the pupil: 1. hypothetical-deductive thinking/reasoning, and 2. the ability to decode/infer words from context.

1. Delimitation of concepts

In the following section we analyze the key concepts of the research objective. We focus on cognitive processes: *1. deductive reasoning, 2. hypothetical thinking*, which is in conjunction with deductive interference manifested in 3. the *ability to derive the meaning of words from the context in which they appear.*

Reasoning

"Reasoning is a process of thought that yields a conclusion from precepts, thoughts, or assertions" (Johnson-Laird, 1999, p. 28). According to The *Cognitive Atlas,* reasoning is a process of *"drawing of inferences or conclusions through the use of reasons"*[2]. This paper is concerned with one sort of reasoning, *deduction*. Psychologists have been studying reasoning for a century, however the study of deductive reasoning has been one of

2 <http://www.cognitiveatlas.org/concepts/r>, available 22.3.2014

the major fields of cognitive psychology for only the past 40 years or so (Evans, 2002; Evans, Newstead, & Byrne, 1993; Manktelow,1999). The field (of deductive reasoning) has its origins in philosophy, within the ancient discipline of logic. Logic is proposed to be the basis for rational human thinking. The psychological study of deductive reasoning has become an established field in psychology, especially reflecting the theories of Jean Piaget (Evans, In Holyoak and Morrison, 2005).

Deductive logic or essence of deductive reasoning

The Cognitive Atlas offers the following definition of deductive reasoning: *"is reasoning which constructs or evaluates deductive arguments"*[3]. Deductive arguments are attempts to show that a conclusion necessarily follows from a set of premises or hypotheses. According to Stalnaker, deduction yields valid conclusions, which must be true given that their premises are true. In other words – deductive reasoning is a logical process in which a conclusion is based on the concordance of multiple premises that are generally assumed to be true. Deductive reasoning is sometimes referred to as top-down logic. In deductive reasoning, if something is true of a class of things in general, it is also true for all members of that class. For example, *"All men are mortal. Harold is a man. Therefore, Harold is mortal."* For deductive reasoning to be sound, the hypothesis must be correct. It is assumed that the premises, "All men are mortal" and "Harold is a man" are true. Therefore, the conclusion is logical and true. Inductive reasoning is the opposite of deductive reasoning. This is sometimes called a "bottom up" approach. Where deductive reasoning proceeds from general premises to a specific conclusion, inductive reasoning proceeds from specific premises to a general conclusion. Even if all of the premises are true in a statement, inductive reasoning allows for the conclusion to be false. Here's an example: *"Harold is a grandfather. Harold is bald. Therefore, all grandfathers are bald."* The conclusion does not follow logically from the statements (Zimmerman – Pretz, 2012).

[3] <http://www.cognitiveatlas.org/concept/deductive_reasoning>, available 22.3.2014

The questions raised in the deductive reasoning research are as follows: 1. what is the mind computing when it makes deductions, 2. what are the accounts of deductive competence, 3. How does the mind carry out these computations, that is, theories of deductive performance (Johnson-Laird, 1999, p. 29). Individuals differ in their capability of deductive reasoning, and those who are better at it – at least as measured by intelligence tests – appear to be more successful (Stalnaker, In Adler – Rips, 2008).

Deductive and hypothetical reasoning

Deductive reasoning in research literature is often connected with hypothetical thinking. This connection often appears in references to the *hypothetical-deductive method,* which is a very important method for testing theories or hypotheses, and is one of the most basic methods common to all scientific disciplines[4]. As Walker stated …*"reasoning involves starting with a general theory of all possible factors that might affect an outcome and forming a hypothesis; then deductions are made from that hypothesis to predict what might happen in an experiment. In scientific inquiry, hypothetical-deductive reasoning is very important because, in order to solve science problems, you need to make hypotheses"…* (Walker – Kintsch, 1995; Walker, 2010). Hypothetical thinking itself as a substance, or rather manifestation of deductive reasoning, is defined "*…as the ability to reason about alternatives to the way the world is believed to be"* (Evans, 2007). This definition highlights three general components: recruiting the imagination, making inferences about imagined states of affairs, and interpreting the real world consequences of the states imagined. Hypothetical thinking as the process of generating hypotheses, arguments, alternative event sequences, or pretend scenarios involves the imagination. Wilson and Conyers suggest that hypothetical thinking is a "Cognitive Asset," which they define as skills that are related to thinking which are of extraordinary value (Wilson – Conyers, 2006, p. 6). The ability of children to

[4] iSTAR Assessment, Inquiry for Scientific Thinking and Reasoning, <http://www.istarassessment.org/?s=deductive+reasoning)>, available 22.3.2014

develop hypothetical-deductive reasoning has considerable educational manifestations. Hypothetical-deductive reasoning is important in concept construction because students typically do not come to a learning situation without a previously built conceptual system. Rather, they come with alternative conceptions (i.e. hypotheses) that must be modified or replaced by scientific conceptions. Thus, concept construction often engages hypothetical-deductive reasoning skills (Lawson, Abraham & Renner, 1989; Lawson & Renner, 1975; Lawson & Thompson, 1988; Lawson & Weser, 1990; Lawson et al., 2000). Through hypothetical-deductive reasoning and experimentation, students can test their preconceptions against scientific concepts and find out which match experimental results. This promotes conceptual change.

Deductive inference and inferring word meaning from context

Deductive inference is an application of the principles of deductive reasoning when working with cognitive material. *"Deductive inference is a type of inference in which the conclusion always follows from the stated premises. If the premises are true, then the conclusion is valid"*[5]. The cognitive process of deductive inference is also activated in the process of deriving the meaning of words from their context. Context, when applied to decoding or word recognition from their context, refers to the use of syntactic and meaning clues to help to identify an unknown or difficult word in a text that is being read. The process of deriving the meaning of words from their context can be delimited as follows: if an individual is unable to semantically decode a word in a text because he does not yet have its meaning stored in his memory, he must use some strategy that will enable him to gain its meaning from the text. There are at least two ways of coping with the situation. The first option orients the individual towards using an external source (such as a dictionary or somebody else´s explanation). The second option consists of mobilizing the individual´s own mental capacities, whereby he decodes the meaning of the text 1. from

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5 <http://www.cognitiveatlas.org/concept/deductive_inference>, available 22.3.2014

the information which is already stored in his memory, and 2. from the input provided by the context. Sternberg (1996) states that we deal here with the use of context-sensitive keys. Werner and Kaplan (1952) some time ago claimed that people acquire a large part of their vocabulary indirectly, i.e. without the use of external resources, but through ´grasping´ the meaning of the word from the overall information that surrounds it. Sternberg (1996) points to the results of the research by Van Daalen - Kapteijns and Mohr (1981) as well as to the results of his own research (Sternberg, 1982) in which it was found out that the ability to infer and learn the meaning of words from a sentence's context is connected with the overall range of an individual´s vocabulary. Subjects with a large vocabulary were able to analyze the possible meanings of a new word at a deeper level than those with a small vocabulary. Moreover, subjects with a rich vocabulary used well-formulated strategies in revealing the meaning of a word, while subjects with a small vocabulary utilized the trial/error procedure without applying the strategy of task solving, i.e. without inferring word meaning from the context. Based on further research into cognitive aspects, relations between performance in reading and the ability to infer word meaning from context were detected. For example, McKeown (1985, In Khun, Stahl, 1998) found that struggling readers are significantly less efficient at deriving words from context. They have a more difficult time separating the meaning of the word from the meaning of the context as a whole and have greater difficulty finding overlaps in the information derived from more than one context. The initial approaches to teaching children to use context more efficiently involved the development and direct teaching of taxonomies of context clues (e.g. Ames 1966; Quealy, 1969, In Khun – Stahl, 1998; Goerss et al.'s, 1994).

2. Research problem, hypothesis, variables

Since 2012, we have been carrying out research into the nature of the cognitive and executive processes of primary school pupils. Knowing these processes is important in terms of: a) effective diagnostics amongst the primary school population generally; and b) stimulation of pupils with special educational needs.

This contribution describes and analyses part of our research and presents the results of our study of differences in pupils' *levels of hypothetical-deductive reasoning and the ability to decode words in context between standard or average pupils and gifted pupils.*

We formulated the following questions as part of our research:

What is the relationship between levels of hypothetical-deductive reasoning and the pupils' 'intellectual abilities?

What is the relationship between the ability to infer the meaning of words (decoding) in context and the pupils' 'intellectual abilities?

On the basis of these questions, we make the following hypotheses:

We assume that there is a relationship between the pupils' intellect and level of hypothetical-deductive reasoning.

We assume that there is a statistically significant difference in the level of hypothetical-deductive reasoning between a) gifted pupils and b) standard (average) pupils.

We assume that there is a statistically significant difference in the ability to infer the meaning of words in context between a) gifted pupils and b) standard pupils.

Operational definition of variables in the hypothesis:

Dependent variable no. 1: *level of hypothetical reasoning:*

The operational definition of the first dependent variable is the score achieved in the WORD CONTEXT TEST- WCT, DKEFS test battery, see more info about the battery in part 4 of this paper (D-KEFS; Delis, Kaplan & Kramer, 2001). With this variable, the key score is in the primary measure: WCT Total Consecutively Correct - Consecutively Correct Raw Score.

Dependent variable no. 2: *level of ability to infer the meaning of words in context:*

The operational definition of the second dependent variable is the score achieved in the WORD CONTEXT TEST (WCT, DKEFS test battery). With this variable, the key scores are those in the secondary indicators:

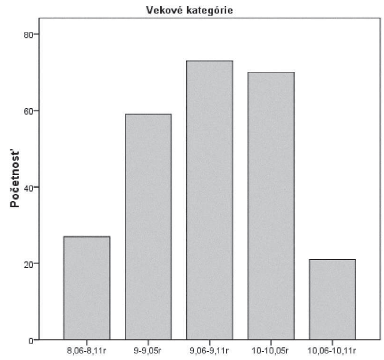
- Secondary indicator: WCT First Sentence Correct Raw Score
- Secondary indicator: WCT Consistently Correct Ratio
- Secondary indicator: WCT Repeated Incorrect
- Secondary indicator: WCT No/Don't Know Responses
- Secondary indicator: WCT No/Don't Know Responses.

Independent variable no. 1: as a measure *of general intelligence,* a factor score based on one's performance in all the subtests of the Woodcock-Johnson International Edition was used. To reduce the data into a single dimension reflecting a principal component, analysis was carried out. We extracted a single factor (component), accounting for 32% of variance in all WJ test indicators. The acceptable value of the Kaiser-Meyer-Olkin measure (.79) and a significant Bartlett test implied the adequacy of such an extraction. A regression factor score was computed, checked for normality and then used as an overall indicator of intellectual functioning. In the case of this independent variable, we differentiate between pupils taught in a standard school and pupils from classes created purposely for gifted learners. For more details about the selection of the two samples, see the next section.

3. Research sample

Research was carried out: a) on a sample of pupils attending the fourth year of ordinary primary schools; and b) on a sample of gifted pupils attending the fourth year of special classes for gifted pupils. The first sample was made up of 250 fourth-year pupils from standard primary schools in the Prešov and Košice regions. Gender distribution: 41.20 % boys, 52.80 % girls.

Graph no. 1: The age distribution of the sample of pupils from standard schools



The second sample was made up of 33 gifted students chosen on the basis of their academic records and a complex psychological examination. At the time of testing, these pupils had been attending a special class for four years. Age and gender distribution was approximately the same as with the sample of pupils from standard schools. The children were identified as gifted and subsequently admitted to the special class on the basis of fulfilling certain conditions, one of which was an above-average IQ measured using a standardized IQ test (specifically the WAIS-III test and Raven standard matrices). The required score had to be a value beyond two standard deviations (with an average of 100 and SD of 10, this was an IQ score of 130). The children also had to demonstrate their intellectual abilities in separate reading, writing and mathematical tests. Through an interview both with them and their parents, the children had the opportunity to discuss any special interests they might have (animals, outer space, transport, technology, etc.) as well as show their level of willpower and motivation.

4. Methods

The WCT - WORD CONTEXT TEST was used for measuring the two dependent variables (level of hypothetical thinking and ability to infer the meaning of words from context). This test is a separate part of the Delis Kaplan Executive Function System test battery (D-KEFS; Delis, Kaplan & Kramer, 2001). This is a standardized battery for the complex evaluation of higher mental or executive functions. The battery is made up of 9 separate tests assessing a wide range of executive functions in both verbal and non-verbal domains. Most D-KEFS tests are adaptations of tests frequently used in neuropsychological diagnostics. The test has extra sensitivity in diagnosing cognitive (executive) deficiencies and was developed both for clinical use when diagnosing disorders of mental functioning and for school psychodiagnostics as a complementary method to intelligence tests. The D-KEFS battery is also suitable for identifying gifted children together with assessing their psychometric IQ. Levels of hypothetical reasoning and the ability to infer the meaning of words from context were both assessed using the WCT test (part of the DKEFS battery). According to the designers of the test, its diagnostic implications can be formulated as follows: success in this test requires basic receptive and expressive language skills. One's performance indicates the level of executive functioning in verbal modality, levels of hypothetical-deductive reasoning, the ability to integrate several sources of information, cognitive flexibility, levels of verbal abstraction and the testee's ability to infer the meaning of a word from the context given (D-KEFS; Delis, Kaplan & Kramer, 2001). The inference of words from context depends on several capabilities: a) obtaining access to the meaning of words through context, b) creating a mental model of the text, c) grasping the key relevant information from the text, and d) deriving word meaning from context.

The main task of the testee is to discover the meaning of the artificial or invented word (e.g. *krafat*) with the help of the clues given – sentences in which the invented word is given context. For each word there are five sentences. The administrator reads out these sentences one by one and points to the sentences written down at the same time (in the test booklet). While the first sentence gives only a vague or general indication of what the word might mean, each subsequent sentence gives more clues and more detailed information to help the testee deduce the meaning of the word. The testee tries to deduce the meaning of the invented word from the given context using the least number of sentences. The test is made up of one practice item and ten test items. (Each item is made up of one invented word and a set of five clues in the form of sentences.)

The primary achievement measure of WCT is *Consecutively Correct Raw Score (CC)*.The score is based on the first correct response to a clue sentence of an item that the examinee provides and continues to provide for all the remaining clue sentences for that item.

Optional processes and error measures are represented by the following indicators:

WCT First Sentence Correct Raw Score (FSC). Reflects the first sentence to which the examinee provides a correct response, regardless of whether or not this response is consistently reported for the remaining clue sentences.

WCT Consistently Correct Ratio: This score is a kind of index of response consistency. In most cases the CC and FSC will be the same, and the CCR will be 100%.

WCT Repeated Incorrect: The measure reflects the number of incorrect responses that are repeated within the same items.

WCT No/Don't Know Responses: This measure is the number of clue sentences to which the examinee provides either a "no" response or a "do not know" response, after being prompted by the examiner to take a guess.

WCT Correct-To-Incorrect Errors: Sometimes the respondent responds correctly in the previous sentence, however as a consequence of set-loss error he/she provides an incorrect answer. This measure indicates how often this response pattern occurs.

5. Data analysis

We use the data obtained to do the following:

1. Analysis of the relationship between a pupil's intelligence and: a) level of hypothetical reasoning; and b) level of ability to infer the meaning of words from context among pupils attending the fourth year of standard primary schools;
2. Analysis of differences in: a) level of hypothetical reasoning; and b) level of ability to infer the meaning of words in context between gifted pupils and pupils attending the fourth year of standard primary schools;
3. Analysis of differences in: a) level of hypothetical reasoning; and b) level of ability to infer the meaning of words in context between gifted pupils and pupils from classes of standard primary schools[6] who scored higher than 115 on an IQ test.

Table no 1: Descriptive statistics:
WCT Primary and secondary measures (standard children)

	WCT Total Consecutively Correct	WCT First Sentence Correct	WCT Consecutively Correct Ratio	WCT Repeated Incorrect	WCT No/Don't Know Responses	WCT Correct-to--Incorrect Errors
Mean	15.7	18.1	86.7	4.9	3.1	0.8
Median	16.0	18.0	89.5	4.0	1.0	1.0
Std. Deviation	5.2	5.1	15.2	3.5	5.3	0.9
Range	28.0	26.0	63.2	16.0	35.0	4.0

6 In the presented paper used also as a "standard" pupils, without any additional connotation.

Table no 2: Descriptive statistics:
WCT Primary and secondary measures (gifted children)

	WCT Total Consecutively Correct	WCT First Sentence Correct	WCT Consecutively Correct Ratio	WCT Repeated Incorrect	WCT No/Don't Know Responses	WCT Correct-to--Incorrect Errors
Mean	20.7	22.5	91.9	5.5	0.8	0.6
Median	20.0	22.0	92.9	6.0	0.0	1.0
Std. Deviation	4.3	3.9	9.3	2.9	2.3	0.7
Range	18.0	15.0	30.0	9.0	11.0	2.0

The relationship between a pupil´s intelligence and (1) the level of his/her hypothetical thinking and (2) the level of his/her ability to infer word meaning from context – standard children.

There was a moderate-to-strong relationship between the primary performance indicator of the WCT (Total consecutively correct answers) and IQ, r_S (249) = .43, p < .001 (see Table 3). Regarding the secondary measures, a significant low-to-moderate relationship with IQ was found in all of them except for the "Repeated Incorrect" indicator with null correlation.

In other words: it can be stated that the level of a pupil´s hypothetical-deductive reasoning represented by the primary WCT indicator is related to IQ. Secondary WCT indicators (four indicators of the total of 5) that address the level of ability to infer words from context reveal a similar relationship with the psychometric IQ. Pupils with a higher psychometric IQ - in our research - were able to decode unknown words from the context more quickly.

Table no 3: Spearman's correlations

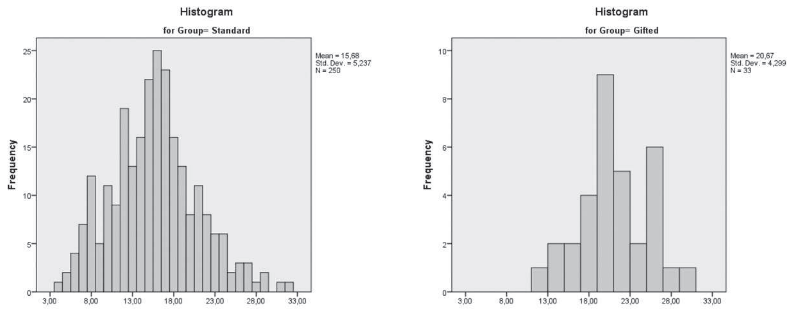
	IQ	WCT Total Consecutively	Correct WCT First Sentence	Correct WCT Consecutively Correct	Ratio WCT Repeated Incorrect	WCT No/Don't Know Responses
WCT Total Consecutively Correct	.427**					
WCT First Sentence Correct	.329**	.833**				
WCT Consecutively Correct Ratio	.241**	.434**	-.064			
WCT Repeated Incorrect	-.045	-.171**	-.253**	.145*		
WCT No/Don't Know Responses	.129*	.022	-.086	.201**	-.285**	
WCT Correct-to--Incorrect Errors	-.151*	-.246**	.217**	-.875**	-.157*	-.210**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Listwise N = 249

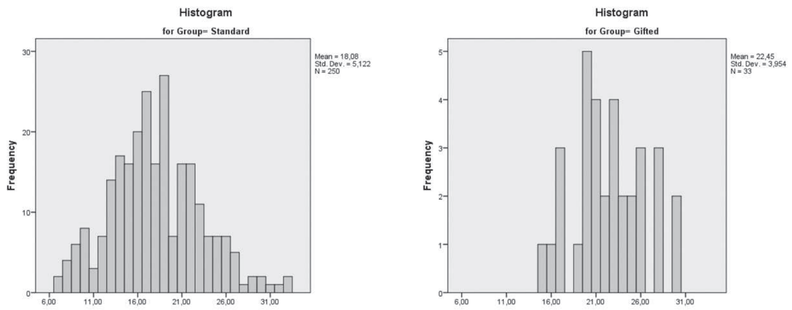
The differences (1) in the level of hypothetical thinking and (2) in the level of ability to infer word meaning from context among talented and standard pupils.

Below we present the histograms in order to graphically represent the distribution of scores in the primary as well as secondary indicators in WCT, both standard and gifted group (histograms are equally scaled).

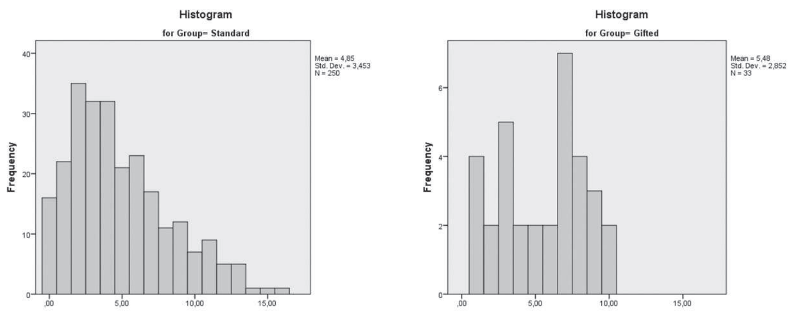
Graphs no. 2 and 3: Distribution of scores in the indicator WCT Total Consecutively Correct – standard and gifted



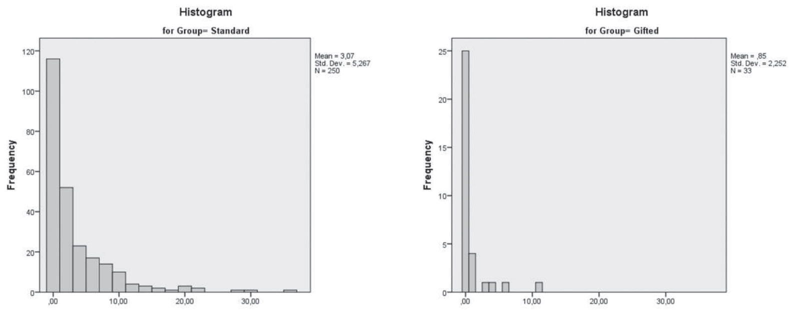
Graphs no. 4 and 5: Distribution of scores in the indicator WCT First Sentence Correct – standard and gifted



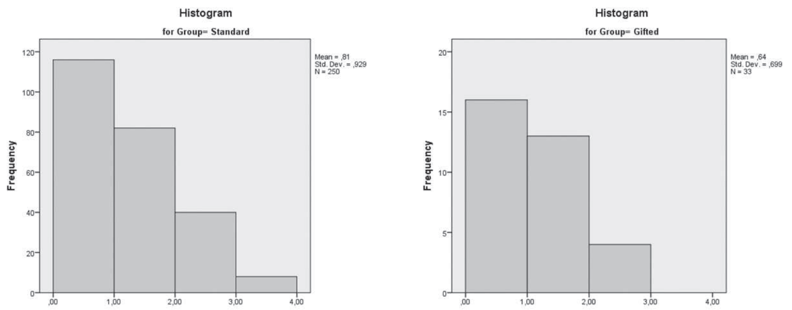
Graphs no. 6 and 7: Distribution of scores in the indicator WCT Repeated Incorrect – standard and gifted



Graphs no. 8 and 9: Distribution of scores in the indicator WCT No/Do not Know Responses – standard and gifted



Graphs no. 10 and 11: Distribution of scores in the indicator WCT Correct- to-Incorrect Errors – standard and gifted



The indicators "WCT Total Consecutively Correct" and "WCT First sentence correct" for the standard population were slightly positively skewed. However, since the skew was statistically significant at $p < .05$, it was not appropriate to interpret means and standard deviations. The other secondary indicators reflecting the errors are highly positively skewed and/or leptocurtic by their nature, and parametric distribution could not be expected. The distribution of IQ scores was normal (skew = 1.63). The performance in the gifted population was far less variable (given the differences in range) than the performance of standard children, where the individual differences among the children were more pronounced. Since the variables were not normally distributed, statistical comparisons between groups had to be based on a nonparametric test, namely the Mann-Whitney U-test. Regarding the "WCT Consecutively Correct" indicator, the performance of gifted children (*Mdn* = 20) differed significantly from the performance of the standard children (*Mdn* = 16), $U = 1859$, $z = -5.1$, $p < .001$, $r = -.30$. The effect size can be considered moderate. Apart from the primary measure, gifted children performed better in the indicators "WCT First Sentence Correct" and "WCT No/Don't Know Responses" (*Mdn* = 22 and *Mdn* = 1, respectively) than the standard population (*Mdn* = 18 and *Mdn* = 0, respectively), $U = 2022$, $z = -4.8$, $p < .001$, $r = -.29$ and $U = 2780$, $z = -3.3$, $p < .001$, $r = -.20$, respectively. The effect sizes of the differences were of low-to-moderate magnitude. The differences in other variables were not significant and those minor differences between the groups could have arisen due to sampling error effects.

To sum up, gifted children show a higher level of primary indicator, which refers to the level of deductive reasoning. They require fewer prompting sentences to identify word meaning from context. A significant difference was also detected in using the "I do not know" answer. Gifted children almost never used this option and tried to identify the unknown word in the way required by the task. It can be concluded that gifted children are not afraid to take risks, even if their response may not be correct. This phenomenon is in accordance with the affective characteristics of gifted students which is presented in the literature. Gifted pupils are characterized by a higher degree of confidence and impulsiveness in responses, and hence also by a lower level of their fear of failure.

The differences in: a) the level of hypothetical reasoning; and b) the level of ability to infer the meaning of words in context between gifted pupils and pupils from standard classes who scored higher than 115 in an IQ test.

When comparing the children placed in special gifted classes and children with IQ beyond 1 SD (i.e. IQ 115 and more) schooled in standard classes, there was no difference in the primary WCT indicator, nor in the secondary indicators, except for the "No/Don't Know Responses", where the gifted children made significantly fewer such responses than the children from the standard population with an IQ beyond 1SD, $U = 2780$, $z = -3.3$, $p = .001$. However, the effect size of the difference was rather low, at $r = -.21$. The data adduced above suggests that no difference was observed in the primary indicator between the performance of pupils in classes for gifted pupils and those with the measured IQ over 115 from standard classes. No difference was recorded in the level of deductive reasoning and the ability to infer word meaning from context. The higher rate of the "I do not know" answers among standard pupils (even with psychometric IQ over 115) points more to differences in affective, rather than cognitive, characteristics between gifted and standard pupils. It is probably the teaching climate in classes for the gifted, parents´ and teachers´ attitudes which influence gifted pupils´ self-perception and their willingness to respond in any situation without the fear of failure.

Discussion

The primary intention of the presented paper is to contribute to the understanding of what is deductive reasoning and what is deductive inference, manifested in the ability to decode and learn words from context.

Our objective is to present a WCT DKEFS diagnostic procedure to identify levels of pupils´ deductive reasoning. On the basis of the results obtained in the process of the administration of the tool on the sample of 9–10 year-old pupils attending standard schools and pupils educated in classes for gifted, we explored the level of hypothetical-deductive thinking in both groups of pupils.

The research suggests the following directions of discussion: every teaching text devoted to teaching theory emphasizes that the teacher, while working with instructional material, is to develop pupils´ deductive and hypothetical thinking. Less has been written about how this should be done, how the teacher should proceed when assessing levels of deductive reasoning, what kind of pupils´ performance addresses their capability of deductive inference, and what the procedures are for the development of logic that go beyond the framework of a mathematics curriculum.

The discussion also poses the question: what do we actually know about the cognitive profile of a gifted pupil? How can the differential diagnosis of gifted pupils be enhanced? On the basis of what criterion are pupils currently assigned to classes for the gifted? Our intention is also to reflect on the ways to identify talent in general, on the methods for the education of gifted pupils. Personality specifics of gifted pupils currently belong to interesting areas of psychology and pedagogy. While defining talent and characterizing a cognitive profile of gifted pupils, several authors claim that talent is a multidimensional concept. Talent is the result of the interaction of personality factors, environmental factors and other variables, such as luck and chance. In almost every model available, a domain of cognitive traits of a gifted pupil is presented. Most often these properties of talent are presented within the cognitive domain: intellectual skills, which include general communicative, verbal, spatial, memory capabilities and reasoning factors in the framework of basic mental functions. The higher rate of the "I do not know" answers among standard pupils (even with psychometric IQ over 115) points more to differences in affective, rather than cognitive, characteristics between gifted and standard pupils. It is probably the teaching climate in classes for the gifted, parents´ and teachers´ attitudes which influence gifted pupils´ self-perception and their willingness to respond in any situation without the fear of failure. We may pose the question: what performance profile is valuable in school settings? Impulsive, although not necessarily correct (recorded in the sample of gifted pupils) or more reflexive, although the correct answer may be formulated later (recorded in the sample of standard pupils)?