



STUDIA UNIVERSITATIS
BABEŞ-BOLYAI



PSYCHOLOGIA PAEDAGOGIA

2/2008

S T U D I A
UNIVERSITATIS BABEŞ-BOLYAI

PSYCHOLOGIA-PAEDAGOGIA

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**NOTES ON THE ASSESSMENT OF COGNITIVE ABILITIES,
WITH IMPLICATIONS FOR SPECIAL EDUCATION
ASSESSMENT IN ROMANIA**

BOB IVES*

ABSTRACT. Die zuverlässige und korrekte Bewertung der kognitiven Fähigkeiten ist ein wesentlicher Punkt für die Beurteilung des Anspruchs auf Sonderschulunterricht für jene Schüler die daran Bedarf haben. Diese Gruppe enthält Schüler mit Lernschwierigkeiten und Entwicklungsstörungen. Sie machen einen Großteil der Schüler aus, die Sonderschulunterricht benötigen. Offensichtlich hat das rumänische Ausbildungssystem seit 1989 massive Reformen erfahren, diese Anstrengungen werden im Zuge des EU Beitrittes fortgeführt. Diese Reformbemühungen haben die Sonderschulbildung mindestens genauso beeinflusst wie die anderen Bereiche des Bildungssystems. In dieser Arbeit werde ich kurz einige der Herausforderungen und Ziele für die Reform der Beurteilungsmethodik kognitiver Fähigkeiten in Rumänien vorstellen und bewerten. Anschließend werde ich zwei in englischer Sprache weit verbreitete und anerkannte Instrumente zur Bewertung geistiger Fähigkeiten vorstellen. Die beiden Methoden werden nach ihren theoretischen Aspekten, Forschungsgrundlagen und Anwendung für die Sonderschulbildung verglichen. Zurzeit laufen rumänische Projekte zur Übersetzung beider Instrumente in die rumänische Sprache und zur Überführung in nationale Standards.

Notes on the Assessment of Cognitive Abilities, with Implications for Special Education Assessment in Romania *Special Education Eligibility and Assessment in Romania*

During the decade of the 1990s, the countries of Central and Eastern Europe (CEE), and the Commonwealth of Independent States (CIS), have tripled their rates of identifying children with disabilities. Most of this growth is probably the result of changes in the types of disabilities being identified. Before 1989, children with visual and hearing impairment were identified as *disabled*, as were children with physical disabilities. These two groups made up roughly 2% of the school-age population. At the same time, most children with cognitive disabilities, known as *special needs* children, were not being identified. During the last fifteen years more of these children in the latter group were being identified. As a result overall rates of identification are rising closer to the 10-12% rates typically found in western countries (UNICEF Innocenti Research Centre, 2005, p. 157). By contrast,

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Romania identifies and serves a lower proportion of children with disabilities than other CEE/CIS countries. For example, in 1997 about 2% of children were eligible for SPED services in Romania. By 1999 this proportion has risen to just over 3% being served by a SPED system that is relatively well developed, but in which most students with disabilities are segregated from other students (Eurydice, 1999/2000).

The 1995 Education Law in Romania tasked the Ministry of Education with the responsibility of determining national curriculum and assessment procedures, including the curricula, assessment and eligibility criteria for children with disabilities (Butuca et al., 2001). This eligibility process for students with disabilities in Romania begins with a team within schools responsible for monitoring and evaluating student learning as well as social problems. This Service for Complex Evaluation of the Child (SCEC) determines whether or not to recommend a child for eligibility. If the team decides to make this recommendation, the team submits a report to the Child Protection Commission (CPC). This report must indicate the level and type of disability identified, and the plan for implementing services for the child. The CPC then certifies the eligibility recommended by the SCEC. These certifications are typically consistent with the SCEC findings (EU Monitoring and Advocacy Program of the Open Society Institute, 2005). Once a child is determined to be eligible for SPED services, the law requires that these students are reevaluated annually and may be reassigned to general education based on the recommendations of teachers and psychologists (World Education Forum, 2000). In 2004 examiners became legally liable for the accuracy of their diagnoses. If a diagnosis is determined to be inappropriate, the examiner may be required to pay penalties (EU Monitoring and Advocacy Program of the Open Society Institute, 2005).

The European Union has raised some concerns about the eligibility process in Romania. Specifically, criteria for eligibility are not well-defined and are easy to manipulate. Eligibility evaluations are often superficial, in part because of a lack of standardized instruments and training (EU Monitoring and Advocacy Program of the Open Society Institute, 2005). For example, the primary instrument that has been used for estimating intelligence is the Raven's Matrices test, which has been translated into Romanian and standardized. More broadly based evaluations of intelligence are not available. In addition to the evaluation problems, inconsistencies between eligibility and placement are a fairly common problem (EU Monitoring and Advocacy Program of the Open Society Institute, 2005).

Romania faces some ethical and practical challenges with respect to eligibility for SPED services in the school system. For example, the Roma (Gypsy ethnic group) is disproportionately overrepresented in SPED. Some estimates suggest that the Roma comprise as much as 70% of the SPED population although they represent under 10% of the total population of the country. This overrepresentation may be attributable to a combination of many things. Misdiagnosis is an obvious concern. In addition, Roma people tend to have low income and limited access to health care and good nutrition. Families of young children who attend special schools receive government subsidies and the children receive free meals which

may provide an incentive for Roma families to accept the enrollment of their children in these schools. Roma children are less likely to attend preschool and kindergarten than other children. Further, Romanian may not be the first language of Roma children. All of these contributors are likely exacerbated by the widespread specter of racial discrimination against the Roma (EU Monitoring and Advocacy Program of the Open Society Institute, 2005). Add to these concerns the limited funding available, and the lack of quality assessment instruments standardized in Romania, and it is easy to see that eligibility reform is a complex challenge.

One further concern involves the definitions of disabilities that are being used in Romania. In 1992 the educational system of Romania began to use definitions of mental disabilities that were published by the World Health Organization (WHO) in 1990. These definitions have been revised as recently as 2004, but are still derived from the earlier WHO definitions that are now more than fifteen years old (EU Monitoring and Advocacy Program of the Open Society Institute, 2005). In addition, legislation in Romania does not include an official definition for autism among adults, and intellectual disability is often defined differently for children versus adults. In some circumstances the tenth edition of the International Classification of Diseases (ICD-X) may be used for diagnostic criteria, while in others the fourth edition of the Diagnostic and Statistical Manual (DSM-IV) may be used.

One way to address language and cultural barriers to accurate assessment would be to update the disability definitions to the most current versions offered by the World Health Organization. Of course, these definitions are of limited value if diagnosticians do not have the tools to assess the criteria specified in those definitions. The Organisation for Economic Co-operation and Development (2005) has suggestion that the government establish a commission specifically to address the identification of students with special needs. The educational system needs to find or create, translate and then standardize and disseminate appropriate assessment instruments (EU Monitoring and Advocacy Program of the Open Society Institute, 2005). At the same time, diagnosticians need to be trained in the use of these instruments and the appropriate interpretations of their results. In the next two sections of this article, I will describe two instruments for assessing cognitive abilities – the Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV), and the Woodcock-Johnson Cognitive Battery, International Edition (WJIE). Both of these instruments may be helpful in addressing some of the concerns about special education eligibility assessment in Romania.

Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV)

School psychologists in the United States use the WISC far more often than any other intelligence test, although at least a dozen other tests are available. There are probably several reasons for this popularity. One is that the WISC has been available for many years. The original WISC came out in 1949, and was a revision of a test for adults that was modified for children. This original test was revised in 1974 to create the WISC-R, and then again in 1991 to create the WISC-

III. The most recent WISC-IV was created in 2003. Of course, once psychologists are familiar with an instrument, they are likely to continue to use it, rather than going through the effort of gaining training and experience on a new instrument. In addition, if the psychologist already has WISC scores for students, then comparison with later scores for the same student, and comparisons across students, are much easier when the same instrument is used again.

The current WISC-IV includes ten core subtests and five additional subtests. Results from the test are reported as individual scores for each subtest as well as scores for four composite indexes and an overall intelligence score. The overall intelligence scores can range from 40-160, with a mean of 100, and a standard deviation of 15. The test is designed for children for 6 years old to 16 years and 11 months.

The Verbal Comprehension Index (VCI) is a measure of how well a student can listen to a question, draw on information from their memories, use logical reasoning to reach an answer, and express this answer orally. This index is a good predictor of how well students will do in school, but the results also depend on previous experiences, education, and culture (Mayes & Calhoun). This index is derived from three of the ten core subtests – Similarities, Vocabulary, and Comprehension.

The Perceptual Reasoning Index (PRI) is a measure of nonverbal and fluid reasoning. This index is most closely related to the Raven's Matrices tests that are currently available in Romania. The index draws on visual-motor and visual-spatial skills and applies them to organizing and solving problems. This index is derived from three of the ten core subtests – Block Design, Picture Concepts and Matrix Reasoning.

The Working Memory Index (WMI) is a measure of working memory. Working memory may be described as the ability to retain new information while simultaneously manipulating that information. It is an indicator of concentration, planning, and flexible thinking. However, it is also vulnerable to anxiety (Vock & Holling, 2008). This index is derived from two of the ten core subtests – Digit Span and Letter-Number.

The Processing Speed Index (PSI) is a measure of the ability to quickly scan, identify, and make simple decisions about visual information. This index seems to be not related to cultural background, but is sensitive to motivation and time pressure (Sheppard, 2008). This index is related to the WMI. This index is derived from two of the ten core subtests – Coding and Symbol Search.

The general model for intelligence applied in the WISC-IV is that there is an overall intelligence factor, often referred to as "g," and four subordinate components to this overall factor. These four components are verbal comprehension, perceptual reasoning, working memory, and processing speed. However, research has shown, that the results from the WISC-IV may not conform to this model. For example, Keith, Fine and Taub (2006) found that the Cattell-Horn-Carroll (CHC) model of intelligence fit the results of WISC-IV testing on children better than the model that is associated with the test battery. In addition, the WISC-IV has been criticized

for omitting some components of intelligence that are important for educational applications in general, and identifying cognitive disabilities in particular (Benson, 2008).

The Cattell-Horn-Carroll (CHC) Model of Intelligence

As you might guess from the name of the model, the CHC model is based primarily on the work of three researchers. Instead of starting with a theory, this model was based on research evidence for components of intelligence that has emerged over the last 60 years or more. These three researchers, and others, applied a range of factor analytic statistical approaches to intelligence test results to identify factors that were present in the scores, rather than relying on the content validity of items and subtests to identify those components of intelligence.

In the 1940's and 1950's Cattell identified two components of intelligence that were later described as fluid reasoning and crystallized intelligence (Gf and Gc, respectively) (Cattell, 1943). Identification of these two components was confirmed by other researchers (Thurstone & Thurstone, 1941). Fluid reasoning, or fluid intelligence, refers to inductive and deductive reasoning with tasks that are new to the person being tested. Almost all of these tasks emphasize nonverbal stimuli, but require integrating verbal and nonverbal thinking. Crystallized intelligence indicates the application of knowledge and skills that are already mastered. Verbal subtests of intelligence batteries are closely associated with crystallized intelligence. Subtests of general knowledge and vocabulary are relatively pure measures of crystallized intelligence.

During the 1960's several new components were identified through factor analysis of testing results. These new factors included visual processing (Gv), short-term auditory memory (Gsm), long-term memory retrieval (Glr), and processing speed (Gs) (Horn, 1965). A few years later Horn refined the Gv, Gs and Glr components while identifying an auditory processing component (Ga) (Horn, 1968). This brought to seven the total number of identified cognitive abilities. Subsequent studies have confirmed that the most credible number of components covered in current intelligence tests is in the range of 7-9.

Visual processing involves abilities ranging from simple visual perceptual to more complex, visual cognitive processes. However, they always involve familiar stimuli rather than novel stimuli, as would be seen in a fluid reasoning task. Short-term memory generally addresses the ability to hold auditory information in memory for short periods of time. Long-term retrieval refers to the storage and retrieval of information over longer periods of time when active rehearsal likely does not take place. Processing speed indicates the ability to make fast, simple decisions based on, usually visual, perceptual stimuli. Auditory processing involves simple operations on auditory stimuli. These operations might include comparing similar sounds, sound blending, sound deletions, and distinguishing voices from background noise.

In 1993, John Carroll published the most comprehensive empirically based synthesis of the existing factor analytic research on the structure of human

cognitive abilities (Carroll, 1993). For this work, he began with over 1500 studies spanning 60 years, and from them he identified 461 data sets that were of appropriate quality for his analysis. This work confirmed the seven components previously identified by Cattell and Horn and suggested a three-tiered model of intelligence. In this model, there is an overall *g* factor for intelligence as the top tier. The middle tier includes the seven components identified by Cattell and Horn, as well as possibly one or two more. The bottom tier includes many subcomponents to the seven broad abilities in the middle tier. Eventually this comprehensive model became known as the CHC model, and John Carroll has been described as the “grandmaster of quantitative cognitive science” (Jensen, 2004, p. 157). More recently a number of other components have been suggested, including tactile (Gh), kinesthetic (Gk) and olfactory (Go) abilities, but these have not been widely confirmed by research, and are not typically addressed on intelligence tests.

The CHC Model is based on an extensive base of empirical research that confirms the presence of at least seven broad abilities within the general range of intelligence. The Woodcock-Johnson Cognitive Battery is explicitly constructed around the CHC model of intelligence.

The Woodcock-Johnson Cognitive Battery – International Edition (WJIE)

The Woodcock-Johnson Cognitive Battery – International Edition (WJIE) is based on the English versions of the Woodcock-Johnson Cognitive Battery – Revised (WJ-R), and the Woodcock-Johnson Cognitive Battery – Third Edition (WJ-III). Seven subtests have been selected from these two batteries such that there is one subtest focusing on each of the seven broad cognitive abilities identified in the research summarized above. The WJIE had been translated and standardized in several languages in the region, including Slovak, Hungarian, Latvian, and Czech.

The WJIE permits examiners to identify strengths and weaknesses in each of the seven broad abilities, as well as produce an overall intelligence score. The English subtests have been standardized across participants from 4 years old to over 70 years old. Similar standardizations can be done in other languages if desired. Table 1 shows which subtests are associated with which of the seven broad cognitive abilities.

Table 1.

WJIE subtests, and broad cognitive abilities	
Subtest	Cognitive Ability
Concept Formation	Fluid Reasoning
Verbal Comprehension	Crystallized Intelligence
Sound Patterns	Auditory Processing
Spatial Relations	Visual Processing
Visual Matching	Processing Speed
Numbers Reversed	Short-term Auditory Memory

WISC versus WJIE and the CHC Model

Given that the CHC model of intelligence is thoroughly based on empirical evidence, there is good reason to consider how each of these two test batteries relates to the model. Of course, in some sense this is an unfair comparison because we already know that the WJIE has been explicitly based on the CHC model. There is one subtest in the WJIE for each of the seven broad abilities identified in the CHC model.

What is more interesting is the fact that updates of the WISC have brought this test battery closer to the CHC model than earlier versions. For example, the WISC-III reported an overall intelligence score and separate composite scores for verbal and performance (nonverbal) cognitive abilities. The newer WISC-IV no longer reports verbal and performance composites. Instead the WISC-IV reports scores for four composites – verbal comprehension, perceptual reasoning, working memory, and processing speed. Note that verbal comprehension is strongly associated with crystallized intelligence (Gc) in the CHC model. Similarly, perceptual reasoning is aligned with fluid reasoning (Gf) as well as visual processing (Gv), and processing speed matches with the Gs component of the CHC model. This leaves the working memory index, which seems to be a combination of short-term auditory memory (Gsm) and Gf in the CHC model. Thus, the WISC-IV seems to capture five of the seven broad abilities included in the CHC model, and this impression is confirmed in the work of Keith, Fine and Taub (2006) and broader reviews (Flanagan, Ortiz, & Alfonso, 2007). In fact, the earlier WISC-III did not include measures of Gf (McGrew & Flanagan, 1998), and these are among the new subtests added to the WISC-IV.

The two broad cognitive abilities in the CHC model that are not included in the WISC-IV are auditory processing (Ga) and long-term memory retrieval (Glr). It should be clear to psychologists and educators why these two abilities are important in education in general, and for the identification of students with cognitive disabilities in particular. A large research base has demonstrated that tests of Ga are the best cognitive predictors available for predicting reading ability in languages that are phonetically based, such as Romanian. Children who have low standardized Ga scores are likely to struggle to learn to read, and are likely to benefit from early intervention with intensive phonics instruction. Older children who have difficulty reading often also have low scores on Ga tests. Similarly, it should be obvious that Glr is related to academic success. In fact, typical Glr tasks involve students learning novel associations between visual and verbal stimuli. These tasks have strong parallels to the kinds of tasks that students are asked to perform and be tested on every day in school.

Given the need for better assessment of cognitive abilities in Romania, the translation, standardization, and dissemination of either of these instruments to school psychologists in the country, with appropriate training, would be a strong step towards improving eligibility and instruction services for students with

disabilities. However, the WJIE is more comprehensive, is built on a stronger research base, and can be standardized across a wider age range. It should be apparent from this article that I would advocate strongly in favor of adopting the WJIE for cognitive assessment in Romania.

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THEORY AND APPROACHES TO LEARNING DISABILITIES

VASILE PREDA

ABSTRACT. This study analyses some definitions of learning disabilities, the theoretical and methodological approaches to the types of learning disabilities: a) *developmental learning disabilities*; b) *academic learning disabilities*. The study aims at presenting the *Cognitive Constructivist theory*, *Informal and Post-Modern theories of learning* and approaches of learning competencies: *mediation psychology*, *cognitive learning strategies*, *collaborative learning*, *metacognitive processes*.

KEY-WORDS: *Learning Disabilities*, *types of Learning Disabilities*, *constructivism*, *cognitive psychology*, *mediation psychology*, *cognitive learning strategies*, *Collaborative learning*.

1. Definitions of learning disabilities.

1.1. The definition used in the “*Individuals with Disabilities Education Act*” (IDEA) to define this population of learning reads as follows: “Specific learning disability” means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The term includes such conditions as perceptual disfunctions, brain injury, minimal brain dysfunction dyslexia, and developmental aphasia. The term does not include children who have learning problems that are primarily the result of visual, hearing, or motor disability, or mental retardation, or emotional disturbance, or of environmental, cultural, or economic disadvantage (U.S. Office of Education, 1977).

The definition includes five major components (Raymond, 2004, p. 159-160):

a) “*Disorder in psychological processes*” relates to the presumed source of the student’s learning difficulty, based on theory that the individual does not process information as efficiently or effectively as others do. Various researchers have taken this to refer to perceptual or perceptual-motor processing, psycholinguistic processing, or cognitive functioning.

New diagnostic tools such as magnetic resonance imaging (MRI) have provided evidence that the brains of individuals with learning disabilities differ from typical learners (Shaywitz et al., 1997). The presence of disorders in processing can generally only be inferred from observation of academic and learning behaviors. At the most, this criterion supplies a conceptual explanation of learning disability rather than a diagnostic indicator.

The information sources used most often to determine the presence of learning disability are:

- * Measures of cognitive ability (administered test of intellectual functioning (WISC – III, K-ABC, NEPSY);

- * Measures of perceptual-motor ability (administered the tests: Bender-Gestalt, Frostig, Reversal);

- * Measures of academic achievement, including individual achievement tests;

- * Other indicators of academic achievement or underachievement, such as report cards, group achievement test, teacher anecdotal records, and other reports;

- * Screening tests for vision and hearing;

- * Social and school history information gained from interviews with parents;

- * A variety of other sources, such as classroom observations and results from prereferral interventions. Classroom observation and prereferral interventions can help rule out environmental causes for learning problem.

b) The language component points to the centrality of disorders in understanding or using language: deficits in the receptive language areas of listening and reading as well as in the expressive language functions of speaking and writing.

c) The ability-achievement discrepancy, or “the imperfect ability to” clause, is in generally regarded as one of major operational diagnostic indicators. The discrepancy may be in any single area or it may be in a combination of academic and functional areas: oral expression, listening comprehension, written expression, basic reading skill, reading comprehension, mathematics calculation, mathematics reasoning.

d) The inclusion clause was added to bridge the gap between the present definition. The multiple terms were used to refer to the group of individuals we now have agreed to say have “learning disabilities”. It does not imply that an individual must have one of the listed diagnoses to qualify as having a learning disability, but merely that individuals who were or might have been identified as having one of the listed conditions may now be referred to as having a learning disability. In accordance with this component of definition, students with severe reading disorders, or dyslexia, would be considered to have specific learning disabilities.

e) The term “*learning disability*” developed because there were children who could not read although they could see, could not speak well although they could hear language, could not learn but did not have mental retardation or emotional disabilities, and did not do well in school although they had access to normal opportunities to learn in the school, home, and community. Children assigned to this new category were defined primarily by what they were not: They were not learning, and they did not have visual, hearing, or motor disabilities, mental retardation, emotional disturbance, or environmental, cultural or economic disadvantage that restricted their learning (Lavoie, 1989, apud Raymond, 2004, p. 160). IDEA reinforced this principle when it is stated that children who have not the opportunity to learn may not be identified as having a learning disability (Council for Exceptional

Chidren, 1998). Thus, the exclusion clause becomes the second operational indicator of the presence of a learning disability.

1.2. Alternative Definitions of Learning Disabilities

1.2.1. ***Association for Children with Learning Disabilities (ACLD/LDA)*** sought to achieve number of goals in developing its 1986 definition: "Specific Learning Disabilities is a chronic condition of presumed neurological origin which selectively interferes with the development, integration, and/or demonstration of verbal or non-verbal abilities. Specific Learning Disabilities exists as a distinct handicapping condition and varies in its manifestation and in degree of severity. Throughout life, the condition can affect self esteem, education, vocation, socialisation, and/or daily living activities".

1.2.2. ***The Interagency Committee on Learning Disabilities (ILCD)***, in 1987 (p.222), reported the following definition to Congress: "Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities, or of social skills. These disorders are intrinsic to the individual and are presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g., sensory impairment, mental retardation, social and emotional disturbance), with socio-environmental influences(e.g., cultural differences, insufficient or inappropriate instruction, psychogenetic factors), and especially attention deficit disorder, all of which may cause learning problems, a learning disability is not the direct result of those conditions or influences".

1.2.3. ***The National Joint Committee on Learning Disabilities (NJCLD)*** definition, cited in Hammil (1990, p. 77): "Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may exist concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences".

Hammil (1990) conducted an analysis of the major components of the many attempts at definition, and he concluded that, despite the controversy, there is evidence of common themes throughout most of the definitions. Specifically, Hammill noted the presence of the following themes in most of definitions created since 1968:

- * Central nervous system dysfunction as the presumed cause of the disorder, whether it can be confirmed or not;
- * Underachievement as a primary diagnostic indicator;
- * The effect of learning disability throughout the life span;
- * The presence and centrality of problems with language, academic learning, thinking, and reasoning;
- * The possibility of the coexistence of a learning disability with other conditions;
- * A sense of heterogeneity of the condition and its many manifestations.

Learning disabilities are generally attributed to presumed causal factors in the environment (extrinsic to the individual) or within the person (intrinsic factors). *Intrinsic factors* that have been implicated as causes in learning disabilities are:

- * Genetic differences, since there appears to be some tendency for family members to show these problems across generations;
- * Brain injury (prenatal, perinatal, or postnatal), leading to disruption of a specific brain function;
- * Biochemical imbalances, which are hypothesized to affect brain function;
- * Unspecified brain differences.

The implication of discussion of alternative definitions is that clinical judgment and good diagnostic data are essential to the determination of the nature and extent of the disabilities a child has in learning. It is unlikely that any two students with learning disabilities will ever present the same diagnostic profile. What is needed is documentation of the nature and effect of the learning disability, followed by the development of an appropriate, adaptive educational plan to facilitate each student's learning (Raymond, 2004, p. 165).

2. Types of Learning Disabilities

Learning disabilities are characterized by their heterogeneity more than by any other factor. The difficulties these students experience take many forms, and no two students are alike. Learning disabilities may be divided into two categories: a) developmental learning disabilities, or disabilities in functions that are usually considered prerequisites to successful academic learning; b) academic learning disabilities, or problems in the more traditional areas of school learning (e.g., reading, written language, spelling, mathematics).

a) A diagnostic indicator of a potential *developmental learning disability* is a discrepancy or delay in the acquisition of typical language, attention, and motor skills when compared to other children in the neighborhood or preschool class. According to Treiber and Lahey (1983), Cook, Tessier and Klein (2000), when developmental learning disabilities are identified in a school-age child, it is more efficient and effective to work on remediating those perceptual, memory, language, or attention disabilities within the context of the academic skill areas. Preschool programs should *not* emphasize the direct instruction of reading; rather, the preacademic focus should be on facilitating emergent literacy within naturalistic daily activities (i.e., an appreciation of and interest in the nature and purposes of

writing and reading) and phonological awarenesses. Children's early experiences with literacy and literate oral language styles such as narrative will greatly influence their later academic success. Facilitating children's successful transition to kindergarten requires a thorough understanding of expectations of the receiving classroom (particularly with regard to school language skills and social skills), careful planning for the transition, and collaboration with parents and the receiving teacher (Cook and all., 2000, p. 341).

Developmental learning disabilities involve skills that develop early in a child's life and are central to later academic success. These include attention, perception, and memory, as well as thinking (or cognitive skills) and oral language (Kirk, 1987; Kirk and all., 2003; Raymond, 2004). *Attention* refers to two skills: selective attention, or the skill of maintaining that attention over time. The child who has underdeveloped attention skills will have a difficult time learning effectively and efficiently. *Visual and auditory perceptual skills* are areas of concern for some students with learning disabilities, and they are essential to later development of reading and written language skills. *Memory disorders* can affect short- and/or long-term memory and may be attributed to problems in storing information and/or retrieving information or demand. *Thinking or cognitive disorders* affect the child's ability to solve problems, to develop conceptual knowledge, and to store and retrieve information in long-term memory. *Oral language problems* frequently are followed by later problems in reading and/or writing.

b) *Academic learning disabilities* manifest themselves in school-age youngsters who have normal learning capacity but who fail to develop age-appropriate skills in reading, written expression, spelling, handwriting, and mathematics. Assessment of academic disabilities frequently reveals the presence of previously undetected developmental learning disabilities. When developmental learning disabilities are found to have developed into an academic disability, the program of remediation must consider both areas. Few students with learning disabilities will have all of these problems, and many will have areas of significant strength. They share the name of the disability, and that is frequently all that they have in common. As we approach our work with a particular child, we must remember to let the child show us what we need to do. Programming must be based on individual student needs, regardless of the disability category (Raymond, 2004, p. 169 - 171).

3. Theory and approaches of learning competencies

Research in *cognitive psychology* and in *mediation psychology* with a focus on teaching-learning process, especially on the basis of Feuerstein's theory and methodology put forward in 1987, have strongly influenced the understanding and the implementation of didactic principles. These emphasized the interaction between the degree of functionality of the cognitive processes and the amount of knowledge accumulated, as well as the role played by the *metacognitive processes* in the activity of learning (Doly, 2002).

Feuerstein and all.(1979) defined the didactic relations in instructional activities as based on *mediation*, which allows educators to evaluate and mould their attitude and *teaching style* based on the particularities of cognitive architecture and function of the *student's cognitive styles*. Experiments with the Program of Instrumental Enrichment (P.I.E.), carried out in many countries in yhe world, have proved that intelligence is not invariable (Feuerstein et all.,1979). The psychogenetic principle of accelerating the stadial development of intelligence should be seen through the lens of Gardner's theory of multiple intelligence (1996). This idea is further supported by research that employs activating cognitive methods, proposed by project didactics.

Methods of teaching depend on model of learning. (E.g.– **constructivism:** resource limitations means that the learner simplifies, generalises, reconstructs: learns what able to represent of what taught, cannot learn unless almost know it already).

The methods of teaching: drill and practice; expository teaching; mastery/apprenticeship; learning by example; guided coaching; learning by doing.

For **articulation:** any method of getting student to articulate their knowledge, reasoning, problem-solving processes (e.g. – enquiry teaching); teacher leads articulation; encourage student to artuculate as solve problem; student assumes critic or monitor role.

For **reflection:** enables student tocomparare own problem-solving processes with those of expert, another student, and, ultimately, internal cognitive model.

For **exploration:** pushuing students into problem solving alone; forcing them to explore and set revise their own golas.

Various **methods**, within a framework of Cognitive Apprenticeship are proposed (Granott, 1993; Wood, Bruner, Ross, 1976):

Modelling:

- expert carries out task; student observes and builds conceptual model of processes;
- requires externalization of internal processes.

Coaching:

- observing students while they carry out a task; offer hints;
- scaffolding, feedback, modelling, reminders and new task to brung closer to expert performance.

Scaffolding and Fading:

- supports teaching provides to help carry out task;
- teaching does part that student cannot manage;
- gradually removes support from student.

Initially teacher models process, then turns over to students: coaches them a first to provide scaffolding. As students become more proficient, teacher fades to only monitor give ocassional hints/feedback = *Modelig, Scaffolding, Fading*.

Cognitive Apprenticeship aimed primarily at teaching processes that experts use to handle complex tasks; focus of learning through guided experience on cognitive and metacognitive skills and processes; requires externaization of

processes that are usually carried out internally; encourages development of self-correction and self-monitoring skills.

Cognitive learning strategies focus on *how* children learn rather than *what* they learn. In short, the teacher's role is to help children learn how to learn. Learning is aided immeasurably by the use of internal mediators. Good teaching demands that the student with learning disabilities be encouraged to explore learning alternatives and discover new relationships.

Cognitive constructivism views learning as a process in which the learner actively constructs or builds new ideas or concepts based upon current and past knowledge. In other words, learning involves constructing one's own knowledge from one's own experiences. The teacher acts as a facilitator who encourages students to discover principles for themselves and to construct knowledge by working to solve realistic problems. *Constructivism* emphasizes the importance of the learner being actively involved in the learning process, unlike previous educational viewpoints where the responsibility rested with the instructor to teach and where the learner played a passive, receptive role. Learners do not simply mirror and reflect what they read, but construct their own understanding, look for meaning and will try to find regularity and order in the events of world even in the absence of full or complete information.

The *constructivists researchers* have increasingly acknowledged the importance of social interaction for development of the individual's cognition. Instead, the focus shifts to *historical and social origins of thought* (Vygotsky, 1971-1972, 1978; Cole, 1985), *cooperation and interactions* (Johnson, Johnson and Smith, 1991), and *the importance of environmental effects on the individual* (Bronfenbrenner, 1979). Researchers describe the function of shared activities (Rogoff, 1990), and highlight the influence of the context on learning and development (Lerner and Kaufman, 1985; Fischer, Bullock, Rotenberg, Raya, 1993).

Slavin (2000, p. 256) refers to Vygotsky's theories when he speaks about constructivist theories of learning: "Modern constructivist thought draws most heavily on Vygotsky's theories, which have been used to support classroom instructional methods that emphasize cooperative learning, project-based learning, and discovery. Four key principles derived from Vygotsky's ideas have played an important role". Two of them are very important for cooperative learning. Children learn, he proposed, through joint interactions with adults and more capable peers. On cooperative projects children are exposed to their peers' thinking process; this method not only makes the learning outcome available to all. Vygotsky (1971-1972) noted that successful problem solvers talk themselves through difficult problems. In cooperative groups, children can hear this inner speech out loud and can how successful problem solvers are thinking through their approaches. The second key concept is idea that children learn best the concepts that are in their *zone of proximal development*. When children are working together, each child is likely to have a peer performing on a given task at a slightly higher, cognitive level, exactly within the child's zone of proximal development. According to Vygotsky (1971-1972), the zone of proximal

development is the difference between what a student can do alone and what he/she can do with supportive collaboration. There are implications for cooperative learning situations in a technology class in relation to this theory. First of all, it seems that according to Vygotsky (1978), all learning must take place in cooperative settings as, cognitively, connections cannot be made without this collaboration. Realistically, in a technology classroom, or in any classroom, cooperative learning that can take place is through collaboration.

Collaborative learning is an umbrella term for a variety of approaches in education that involve joint intellectual effort by students or students and teachers. Groups of students work together in searching for understanding, meaning or solutions or creating a product. Learners share a common purpose, depend upon each other and are accountable to each other for their success. Collaborative learning-work, occurs in the context of a group with a common mission or agreed-upon-purpose. The work involves the structuring and restructuring of conceptual knowledge (Cook and all., 2000; <http://w.w.w.calldysc.eu>). Collaborative learning activities can include collaborative writing, group projects, and other activities.

Mediated learning is related to cooperative and to collaborative learning, which is based on the socio-constructivist model (Vygotski, 1978; Bruner, 1983).

Tutor first adopts interactive approach: explorer competency of student with two general questions; verifies exact misconception in next two; attempts to repair misconception with tactic “grain of truth correction”. *Expository tutors:* maintain focus and coherence; cover subject matter in order the supports retrieval. *Procedure tutors:* ordering of subskills; select exercises and examples to reflect order. A curriculum should: divide the material to be learned into manageable units; sequence materials in a way that conveys its structure to students; ensure that instructional goals presented in each unit are achievable; tutors should have mechanisms for evaluating the student reaction to instruction on a moment-to-moment basis and for reformulating the curriculum (Wood and all., 1976; Cook and all., 2000).

Learning-work involves the cognitive processes of assimilation-intake of information from the environment, accommodation-restructuring to fit new into the old, present structure, and integration-directly fitting information into existing structure (Flavel, 2000).

For *constructivists*, learning is not the result of development; *learning is development* (Fosnot, 1996, p. 29). Teaching strategies using *social constructivism* as a referent include teaching in contexts that might be personally meaningful to students, negotiating taken-as-shared meanings with students, class discussion, small-group collaboration and valuing meaningful activity over correct answers. Emphasis is growing on teacher’s use of multiple epistemologies, to maintain dialectic tension between teacher guidance and student-initiated exploration, as well as between social learning and individual learning ([http://wik.ed.uiuc.edu/index.php/SocialConstructivists' Approach to Classroom Discipline](http://wik.ed.uiuc.edu/index.php/SocialConstructivists'ApproachtoClassroomDiscipline)).

Informal and Post-Modern theories deal with more practical breakdown of the learning process. One of these deals with whether learning should take place as a building of concepts toward an overall idea, or the understanding of the overall idea with the details filled in later. Informal learning theory also concerns itself with book vs real-world experience learning (<http://w.w.w.calldysc.eu>).

Interindividual differences are usually expressed during higher level processes, namely *metacognition processes*, which, however, can only be generalized if they may be put into practice in wide array of domains. Metacognition is essential in knowledge acquisition, and in problem-solving learning (Corkill, 1996).

The new paradigm of teaching is based on the theory and research that have clear applications to instruction. In the new paradigm of teaching, knowledge is actively constructed, discovered, transformed, and extended by students. The teacher's effort is aimed at developing students' competencies; education is a personal transaction among students and between teacher and students as they work together.

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APPLICATIONS OF RHYTHMIC EDUCATION IN DEVELOPING COMMUNICATION SKILLS IN HEARING IMPAIRED CHILDREN

MARIA ANCA, CARMEN BODEA

AUSZUG. Die vorliegende Studie setzt sich als Ziel, mehrere Programme für heilpädagogische Rhythmik, und deren Wirksamkeit auf die Entwicklung der verbalen Kommunikation bei Kindern mit Schwerhörigkeit, zu vergleichen. Wir werden die einzigartige Kombination der Übungen, die Auswahl der Übungen, die Bewertung deren Effizienz und die Wirkung der Programme auf die verschiedenen Rhythmuswahrnehmungen und auf die rhythmischen Elementen die zur verbalen Kommunikation beitragen, betrachten. Die Effizienz der suprasegmentalen Aspekte wird sowohl generell, als auch im Einzelnen genauer betrachtet. Wir werden ein Programm für heilpädagogische Rhythmik vorschlagen, der die Entwicklung der verbalen Kommunikation bei Kindern mit Schwerhörigkeit (Hypakusis) und Resthörigkeit stimulieren soll.

SCHLÜSSELWÖRTER: Programm für heilpädagogische Rhythmik, Schwerhörigkeit, Hörtraining, phonetischer Graphismus

There is very little research regarding the effects of rhythmic education on the verbal communication performance of children with hearing impairment. Although, the importance of rhythm in speech perception and production is well known, there is a paucity of research concerning the effects of rhythmic education on various aspects of oral communication in the context of deafness. Investigating the effects of rhythmic education on helping hearing impaired children learn to produce speech is important because knowledge resulting from these investigations has the potential to inform decisions relating to curriculum and speech language therapy methods for deaf children. In Romania, such programs have been proposed before. Also, in other countries, such as France, there are speech therapy approaches that are using rhythm as an essential tool in the speech production process. Some of aforementioned programs or models still have no experimental validation of their positive effects on the language of hearing impaired children.

The current paper will review several rhythmic education programs. In particular, the review will focus on the types of exercises selected, the program evaluation methods, effects on rhythm perception and language production. Investigating these aspects of various programs may lead to valuable answers concerning the efficiency of an isolated approach on prosodic elements of speech in therapy. Subscribing to an integrated approach, we will propose a rhythmic education program that has been applied to hearing impaired children.

Fatu (1969) draws the lines of a rhythm education program in her work entitled "Rhythmic education and medical gymnastics". The author builds this model on the premise that any motion develops in space and time and it needs force. These are the three coordinates to structure the program. No rhythmic education can be built in the absence of spatial concepts related to body scheme and in the lack of temporal perception. These are the first things to be trained in a rhythmic program, starting from spatial orientation based on body scheme and continuing with time perception built first on natural bodily rhythms (such as walk rhythm). The unique combination of exercises addresses psychomotor development of children with various disabilities. The exercises were designed to train rhythm sense and it does not specifically target hearing and language rehabilitation of children with deafness. However, there is no research data based on the program the way it is structured.

Vinko Aldo Gladic's team (1992) (cited by Anca, M. 2000) has applied the method of phonetic graphism in the rehabilitation of speech. The main idea of this program is the synchronous poly-sensory stimulation. Therefore, the method requires the implication of visual, auditory and kinesthetic analyzers. The essence of the program is to build language exercises based on graphics evoked by the symbolic values of sounds and/ or by the qualities of the speech act. Bodily rhythm and language rhythm synchronize in the motor act. Graphics facilitates the perception and understanding of speech. It also has an evoking role through facilitating kinesthetic representations of sounds, words and facilitating retrieval from memory of certain linguistic structures (Anca, 2000). Rhythm facilitates language and is evoked through sound production, associated graphic gesture and the reading of the graphic trace. An unlimited number of exercises can be built on its principles. These exercises imply a continuous passing from verbal rhythm to motor rhythm and backwards. It involves the rhythm of the entire body, hand rhythm and fingers rhythm, as well as motor coordination.

Fotiadou, Tsimaras, Giagazoglou et colab. (2006) have designed and used a rhythmic gymnastics program for hearing impaired children, addressing rhythm perception. Considering the wide variety of means, such as body movements, apparatus elements, rhythm, and rhythmic gymnastics can be effective in increasing this ability in children with hearing impairment. The team has studied the efficacy of the program in the case of children with profound and severe hearing impairments. The program was structured over 16 weeks, at a frequency of three weekly sessions, each lasting 40 minutes. Fotiadou, Tsimaras, Giagazoglou et colab. (2006) have extensively presented the program in their article. We will present excerpts of it: body movement elements (walking patterns in different tempos along with rhythmic clapping, marching in all directions at various speeds with intermediate pauses, body rotations), apparatus elements (rope movements, hoop movements, ball movements, ribbon movements). An important element for the understanding of rhythm is the pause (silent time intervals). Kinesthetic and visual stimulation facilitate perception of rhythm and these exercises were developed to mark the pauses in a special way.

After the program was conducted, results indicated a significant improvement of rhythmic ability in the experimental group. The execution of 5 rhythmic patterns in three different tempos improved after the special training. An element of novelty was the use of an objective measurement method to evaluate the perception of rhythm, such as the analysis of sound data in the Sound forge 4.5 software. Other specific elements are: the combination of dance elements with gymnastics elements, adaptation of the program for the disability category, the method of application (individually, in pairs or in groups of three), the emphasis on the visual perception of pause inside the rhythm.

One limit of this study is the inclusion of specific age group which affects generalization of results.

The rhythmic education program that we propose contains various exercises focused on developing the supra-segmental elements of speech. Rhythmic exercises practice contributes to enrich the physiological readiness necessary for language acquisition. The positive effect of rhythmic exercises results also from their influence on the well being of the child.

The exercises were introduced gradually based on their complexity, and involve a wide range of physical and psychological aspects.

A session of rhythmic education followed the structure below:

1. preparation, by organizing the group, capturing their interest and attention; relaxation exercises, exercises in which we alternated relaxation and tension
2. breathing exercises(isolated or associated with movements)
3. movement exercises for the entire body: passive and active
4. exercises concerning various muscular groups
5. general rhythmic exercises accompanied by oral productions
6. rhythmic alphabet (2-3 stanzas to 5-6 for one letter/ session)
7. rhythmic exercises based on a story (last 4-5 sessions)
8. rhythmic exercises accompanied by phonetic graphism (first, the graphic-phonemic representation of non- word units, then words, sentences, phrases, stories).

Fatu(1969)argued that in Special Schools for Hearing Impaired, children demonstrate an insufficient development of the respiratory system, phenomenon explained through the lack of its involvement in the speech process. This will lead to:

- reduced lung capacity
- inadequate development of speech organs
- slow, short and superficial breathing
- gestures meant to replace the speech.

The correct respiration has to be slow, profound, rhythmical and continuous. In order to achieve this goal in the case of hearing impaired children, Gutzmann and Klenke (cited by Gutu, 1978) breathing method can be applied. Hearing impaired children are easily taught if different and suggestive visual stimuli are used. These stimuli have to be big, clear with simple and explicit drawings.

The figures below (1, 2, 3, and 4) will represent in a schematic way the following elements:

1. the top of the funnel represents the inspiration
2. the turning point, from the top until the horizontal line represents the pause in respiration
3. the horizontal line from the turning point straight and to the right represents the expiration

Dotted lines represent an abrupt expiration or inspiration.

These elements can be mixed, emphasizing different respiratory elements.

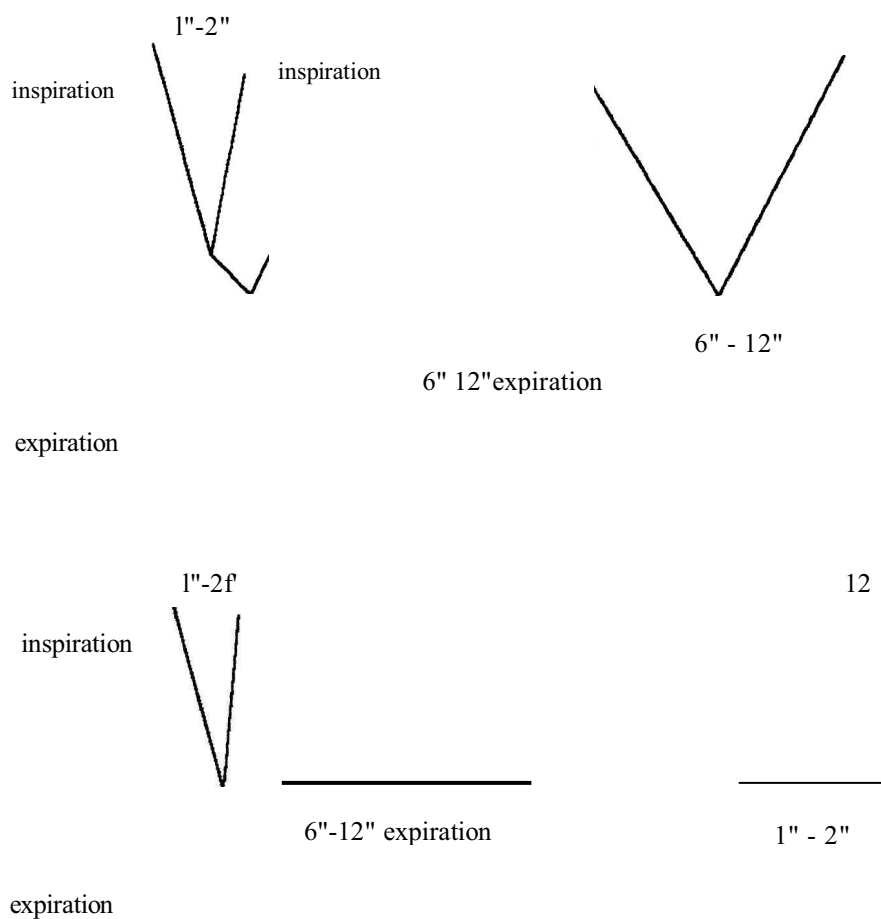


FIGURE 1

Breathing exercises can be independent or associated with movements.

The exercises associated with movements are dynamic exercises which increase the respiratory capacity. They are associated with movements of the entire body, like twisting, bending accompanied with ample respirations which will give a better mobility and elasticity of the chest.

Physical exercises of any kind have to develop a correct respiration and a good coordination of it in the association with body movements. They become respiration exercises along with the progress in speech correction. Exercises associated with respiratory gymnastics are multiple and cannot be applied independently, but systematically following the development of the entire body. Considering the severity of the disability as well as children's' limitations, each physical exercise was transformed into a respiratory and speech one, avoiding this way the monotony and fatigue installed during static exercises.

The rhythmic education contained special exercises that contribute to facial muscles and speech organs muscles building. These exercises are designed to improve face mimics which naturally accompanies sound production and emotional expression. Sounds can express emotions, too, such as happiness, sadness, laughter, cry, astonishment. For example, among vocals, "A" can express joy, surprise, astonishment, understanding; "O" can express regret, disagreement, repentance. Among onomatopoeias "Brrr" suggests cold, "Prrr" is used by coachmen to stop the carriage. Before executing the special facial exercises, the program introduced exercises for relaxation and building of neck muscles.

Facial exercises were comprised of exercises for the head and neck, with emphasis on facial muscles and speech organs. Once these movements were learnt, unlimited combinations could entertain the children through mimics, gestures suited for sounds or movements.

Other examples of such exercises proposed by Fatu (1969) will be presented further:

This exercise was executed on a given rhythm such as a lullaby song: "Na-ni, na-ni, pu- iul ma-mii". The child standing swings his arms from the shoulders towards front and back, on two of "na- ni"; then he/ she swings them laterally, mostly moving the arms from the elbows, expressing "pu-iul mamii". Concomitantly the entire body swings right- left, imitating rocking a baby.

In another type of exercise, the child stands with the arms straight forward, palms down, moving on "mic pi- tic". The child says "mic" 5 times, while bending the knees gradually and lowering the arms. On six, "pi", the child has the arms along the body. On time seven, the fingers touch the floor (face forward, straight back). On eight, the child moves back to the initial position. This is a good exercise for legs, arms and balance.

After sounds and letters were learnt, the program continued with more complex exercises and movements.

The age and the attention span particularities of the deaf students required an approach based on demonstration, examples accompanied by explanations, and extensive use of intuitive materials. One method that is very close to the interests and understanding of the hearing impaired students is the rhythmic alphabet. The rhythmic exercises executed were associated with graphic- phonetic exercises. These exercises were considered on the idea that rhythm is a common factor between language and writing. The relationship between body rhythm (including the rhythm of speech) and graphic movements' rhythm is mutual. The method of phonetic graphism encompasses two directions: from hand movement to dynamics of corresponding side, from the movement of fingers to the movement of the shoulders controlling hand motion; the second direction would be from voice to the dynamics of the entire body, from the most refined interior motions to major movements of the entire body.

There is a more dynamic form of phonetic graphisme, which represents the expression, verbal productions through curves. The graphic traces remain after the movements are gone and facilitate reading based on graphic rhythms.

This activity originates on the following elements that can be graphically represented:

1. cry and the dynamics of elementary uttering accompanying spontaneous movements and types of walking;
2. production of series of syllables;
3. listening to musical instruments, such as guitar, drums, piano, harmonicas;
4. the dynamics of simple verbal rhythms (alternatively grouping two, three or more syllables);
5. the verbal dynamics of words and simple phrases;
6. verbal dynamics of songs and poems (nursery rhymes).

We motivated the children to produce the voice and freely synchronize the pronunciation to manual movements.

For example, for the pronunciation of word "pa- pa" accompanied by hand movement, the graphic representation can differ according to our goal:

- a) the rhythm given by the syllables of the word "pa- pa":



- b) The word as a whole



- c) The intonation curve of the word used as phrase

Papa. (statement)

Papa? (interrogative sentence).

Based on the same method, we used exercises to practice verbal rhythms through games involving body movements. We used stylistic phonograms to evoke the movement and the verbal productions.

We exemplify the stylistic phonograms used to represent the rhythm of non- word units, as well as expressions and phrases.

In order for the hearing impaired students to differentiate between an analogy and a coded symbol, we used different graphic modalities of representation.

Exercise number three transposes verbal rhythms into a rhythmic writing on the board.

Exercise number four: reading of graphic rhythms. One can consider a unit to be a point, a feature or an image and can represent an entire history. It is of great importance that these histories are rhythmic in order to facilitate speech production and learning.

Graphic rhythms' reading is difficult for the hearing impaired children therefore this type of exercise was introduced in the last sessions of the program, after rhythmic exercises on a story were executed.

The approach is an integrative one. The program combines different approaches to speech rehabilitation: classical approach (creating speech readiness by training correct respiration and muscle groups involved in speech) as well as modern approaches, such as rhythmic alphabet and phonetic graphism (which widely involve speech and speech rhythm). The structure of the program follows a gradual increase in complexity, based on the normal developmental steps of correct speech production.

We assessed the efficacy of such program involving rhythm on improving speech, in children with severe and profound hearing impairment. We did not focus on rhythm perception per se, but we used the perception of rhythm as a tool to enhance certain aspects of speech. The direction of rehabilitation goes from supra segmental elements to segmental elements. We examined the speech of our subjects before and after the training, using a task developed by George Bacanu specially designed for children with hearing impairment. The following aspects of speech were recorded on the checklist: voice qualities (intensity, pitch, and timbre), verbal respiration (inspiration and expiration), phoneme pronunciation, speech expressiveness based on prosodic elements.

The results indicated that the program was efficient mostly in improving the pronunciation and expressiveness of speech. No significant effects on the speech qualities were obtained (Anca and Bodea, in press).

Conclusions

In our study, we've reviewed several rhythmic education programs that used rhythm to rehabilitate speech in children with hearing impairment or to improve rhythm perception as means to better access motor skills and balance, and only secondary to develop language. We analyzed two different programs that presented experimental data. In both cases, the programs proved to be beneficial for the hearing impaired children. One program addresses rhythm as an isolated learning unit, while the other utilizes rhythm in the complex context of physical and speech exercises. One

uses rhythmic gymnastics apparatus and specific dance elements, while the other uses rhythm to access speech production. One program puts a great deal of emphasis on visual and kinesthetic perceptions, to compensate hearing, while the other one trains hearing and speech through an optimal synchronization among three analyzers-auditory, visual and kinesthetic. Such findings inform professionals in the field of Special Education on the importance of introducing rhythmic education into the curriculum for children with hearing impairment.

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MUSICAL EDUCATION PROGRAM FOR HEARING IMPAIRED CHILDREN

CAROLINA HAȚEGAN

AUSZUG. Der Artikel "Pädagogisches Musikprogramm für schwerhörige Kinder" besteht aus zwei Teilen: theoretische Basis und praktische Annäherung. Bei der theoretischen Basis wird der Bedarf an didaktischen Methoden, die an dem Entwicklungsgrad der schwerhörigen Kindern angepasst sind, unterstrichen. Diese an den schwerhörigen Kindern angepassten Methoden, ermöglichen ihnen eine normale Entwicklung und Chancengleichheit, Aspekte die für die aktuelle Lehrplanreform in unserem Land sehr wichtig sind. Der praktische Teil besteht aus einem pädagogischen Musikprogramm für Kinder die an Schwerhörigkeit leiden und die am Massenunterricht teilnehmen, eine Unterrichtsform bei der Musikpädagogik mit Sprachtherapie verbunden werden.

SCHLÜSSELWÖRTER: Schwerhörigkeit, Lehrplananpassung, Individualisierung, pädagogisches Musikprogramm, Sprachtherapie

1. Curriculum – theoretic framework

The integration of the disabled children within ordinary schools, as well as the necessity to underline the existence of a new special category of children, those with high educational aptitudes, the category of the gifted children necessarily involves the need to adopt the principle of individualizing or personalizing while projecting the learning situations. Once this principle is fully and correctly applied, there are given the chance to develop properly to all the children, irrespective of their cognitive style. Thus, by putting into practice this principle there are projected learning situations according to the different cognitive styles, these styles being materialized in a school, educational context within learning styles, these learning styles being particular to all the children involved in the educational process (Druțu, 2002).

The differentiated organization of the contents aims the adequation of the instructive-educative process to the skills, to the cognitive abilities, to the children's interests, his working rhythm and his learning styles. In terms of educational politics, the strategy of curricular differentiation is expressed by crossing from "a school for everyone", towards "a school for everyone" (Chiș, 2002).

Within the whole curricular reform from our country, this strategy orientated towards individualization related to the contents organization is developed both according to psych-pedagogical constraints, as to the constraints that come from the need to integrate and to match the education system from our country within the European educational politics (Crețu, 1998).

Through the curricular adaptation according to the international laws it is aimed the development and the confirmation of the general and specific skills, they being manifested on different levels, from disability, retard, till the over the medium developed children, till the gifted one.

The differentiation of the didactic activity aims:

- The contents;
- Teaching-learning methods;
- Psychological medium;
- Performance levels.

The general finality of the individualized educational programs is the curricular adaptation to the children's specific needs and to their possibilities. This aspect is put into practice in a unitary way in Romanian education system, it being stipulated in the Education Law: "The State promotes the principles of the democratic education and guarantees the right to be offered differentiated education, on the basis of the education pluralism".

Due to this perspective upon the education process the new curricular project is individualized and differentiated by being established specific finalities for three cycles of the pre -universitar education: primary education, inferior secondary education and superior secondary education. Knowing these finalities is extremely useful in projecting the didactic activities. In the following lines there are presented the objectives relative to the primary education as they are the one that are useful for us in elaborating this paper.

The objectives are the following:

- The insurance of the elementary education for all the children;
- Building children's personalities respecting their developing rhythm and level;
- Enriching the children with knowledge, abilities, attitudes that are meant to stimulate the actual and creative relating of the child with the social and natural environment, allowing, in the same time, the continuation of education.

These finalities are the result of a curricular structure organized with the aim of the reforming of the whole instructive-educative process. One of the chapters of the Romanian reform concerning education, a reform articulated on the basis of six chapters takes into account the curricular reform.

Thus, the curricular reform from our country is equivalent with the elaboration of the new education plans, of the school programs and textbooks. But, unfortunately as all these enumerated school documents are objectifying the education contents, curriculum was considered to be referring to those contents, to be identified with those contents. This practice underlines that at this level the curricular reform has no meaning as "an old and traditional education practice was transferred to a new concept, without revealing his challenging novelties" (Chiș, 2002).

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In order to prove the fact that the curricular reform is deficient it can be made a parallel between those aspects mentioned in theory and their correspondents in practice. Thus, what was expected to be in theory the nucleus curriculum or the national one is materialized in practice in the common branch. The local curriculum is represented in educational practice by the curriculum decided by the school, and the individual curriculum is replaced in practice with the optional curriculum.

The most deficient problems can be signaled concerning the curriculum decided by the school; it was thought to be the expression of the social and economic needs of a certain community the school is part of. Thus, this type of curriculum was seen as an opportunity to place socio-economically the school within its proximal space. School can't decide about this part of the curriculum, it shouldn't be only up to the school.

There are also major problems in running the optional curriculum. This type of curriculum was considered to be the expression of the pupils' needs; it being considered the way it can be valorized the pupils' uniqueness. It was considered to be a significant part of the education process as the pupils and their families can express their interests concerning a certain aspect, being ensured the possibility to valorize pupils' aptitudes and skills.

The curricular reform understood from the theoretical point of view was organized in the direction to be ensured the equalization of the chances for everyone (through the nucleus curriculum), but in the same time it allows differentiation during the schooling process according the community expression (through the local curriculum), as well as according to the children's needs and their skills (through the individual curriculum).

Unfortunately, in practice field the curricular reform faces many obstacles, especially when it concerns the disabled children who are integrated in regular schools. Through integration the disabled children who are segregated in special schools are given the chance to receive access in larger communities, without them facing any type of discrimination related to the free access, their personal expression, their equal rights and obligations or their personal development according to their capacities, needs, options and their expectances.

Integration can't be put into practice without an adapted curriculum so that the children's capacities and needs are put together, are made to function together as a whole. Thus, through an adapted curriculum it is tried to be underlined the children's strengths in order to be given equal chances for social integration.

In the following lines it is presented a sample of an adapted curriculum for a hearing impaired child that has functional hearing capacity as he has received adequate hearing prosthesis. This adapted curriculum is related to the "Musical Education" object.

Despite the fact that there are specialists that suggest that a hearing impaired child can't develop rhythm as he can't perceive music, it is extremely important he is stimulated in this direction (Anca, 2007).

Through musical education and training the hearing children is given the chance to acquire an extremely important pre-acquisition, it being temporality. The deficiency for perceiving sequences is the main feature of the hearing impairment. As, verbal language develops sequentially it can be understood the hearing impaired children's difficulty to acquire verbal language. Under these circumstances, when training sequentially means time training and when verbal language implies them both through speech rhythm, the child has to be given the chance to train them. Music can be seen the main chance that can be given the child to help his acquire verbal language (Anca, 2000).

The element that brings together music and speech, in a stimulating manner for the hearing impaired children is rhythm. That is why all the research that focuses on speech development and on psycho-motility underlines the rhythm importance, starting with the body rhythm and continuing with the speech one. Among these researches can be mentioned those conducted by the following specialists Glathe, Krause-Wiechert, (1989), Batliner, A., Kiebling, A., Kompe, R., Niemann, H., Nöth, E. (1997), Bailey, T. M., Plunkett, K & Scarpa, E. (1999), Anca (2007).

One we have established the main goal for training music in hearing impaired children and we have into consideration their hearing deficiency as well as their needs we can articulate an adapted curriculum. According to the researches from this field (Brown; Denney, 1997) music is used in four different ways in classrooms with deaf students: music using voice or instruments, music for speech training, music related to subject areas, and music to enhance classroom learning. In our program the focus is on all those four mentioned directions, the program being aimed as an integrated one.

2. School Program- Musical Education for the hearing impaired children integrated in the regular school

This program can be developed twice a week during 35 activity weeks in a school year, thus there are to be developed 70 yearly activities.

2.1 The main objectives are:

- language and hearing stimulation and development, training of the phonemic hearing, stimulating the capacity to discriminate the sounds according to: intensity, tonality, pitch, the rhythm training.
- increasing the verbal expression intelligibility level, improving the verbal fluency, developing the capacity to adequate the verbal expression to the communication context.

- valorizing the language suprasegmental component, training the ability to express emotions through language.
- training and developing the capacity of space-temporal organizing.

2.2. Contents list

- a. Pre-learning assessment- 4 activities
- b. Perceiving and producing rhythmical structures-10 activities
- c. Knowing the musical sounds and the main musical instruments – 10 activities
- d. Relating the musical signs with different intonation patterns – 10 activities
- e. Knowing the notions of duration and intensity – 12 activities
- f. Language in use and role plays – 10 activities
- g. Summative assessment – 4 activities

2.3 Contents lists and samples of activities

1. Pre-learning assessment

It is underlined the capacity for discrimination related to different types of instrumental sounds (the sound made by the piano, by the diapason, by the violin, triangle, whistle, trumpet) and the capacity to discriminate between the vocal sound and the instrumental one. There are also organized activities for making discriminations between different types of voices, on different tonalities, voice belonging to a man, the voice belonging to a woman, the voice belonging to a little boy or the one of a little girl.

2. Perceiving and producing rhythmical structures

Reference objectives:

- to reproduce different rhythmical structures given by the teacher
- to deliver rhythmical structures by himself
- to identify the temporal and spatial distance between different rhythmical beatings, thus the pause between the rhythmical beatings (these are acquire, intuitively during the prenotation period, but exclusively in the condition of validity; when it is to deal with hearing impairment, in order to acquire these it is required a special focus on this aspect, during the instructive-educative process).
- to identify the melody, the direction of the melodic line based on its graphical and on its vibrating presentation

Samples of activities:

There can be organized exercises using different musical instruments in order to deliver rhythmical structures. The instruments can be piano, xylophone, cottage piano.

Another recommended type of exercises can be the one through which the rhythmical structures are reproduced by beating in different objects that have

vibrating capacity (the child has the chance to perceive the rhythmical structure through vibrations).

There can be used exercises for the visual representation of different rhythmical structures with the help of the phonetic drawing and of the discourse graphics or with the help of the musical soft (Media Player, Winamp).

According to ever child's the speech development can be organized exercises for individual creation of different rhythmical structures associated with diverse sounds.

There also can be organized activities and exercises in which the clapping of the hands are hitting in a percussion instrument following a certain rhythm dictated by the metronome. The exercise is started in a slow rhythm and during the exercises the rhythm is getting more and more accelerated, so that the child can discriminate and identify a certain situation by making comparisons between it and the others (Flosi, 1997).

3. Knowing the musical sounds and the main musical instruments

Reference objectives:

- to identify the sounds produced by different objects
- to differentiate between the musical sound and noise
- to identify the musical sounds presented by different musical instruments
- to identify the human voice
- to discriminate between different types of human voices (on different tonalities)
- to sing the musical sounds

Activities:

There can be organized exercises for differentiating between:

- noise-musical sound
- the sound produced by the human voice- the sound produced by the instrument
- the sounds produced by the different musical instruments
- different human voices
- sounds with different tonalities (given by the highness) produced by the same instrument.

Exercises that require the identification and the emission of the musical sounds included in the first octave: do, re, mi, fa, sol, la, si, do are useful in order to achieve the mentioned objectives.

It can be began the initiating in the instrumentalist practice by asking the child to produce rhythmic structures, associated with musical sounds, by using different musical instruments.

The musical instruments that can be used are the fallowing:

- instruments of percussion: drum, tambourine, claves, wooden cylindrical block, triangular wooden block, bells, triangle, castanets , xylophone
- wind instruments: nay, pipe, trumpet.

- instruments with strings : violin, guitar.

4. Relating the musical signs with different intonation patterns

Reference objectives:

- to produce different intonation patterns- rising, falling, neutral
- to associate these patterns with musical sounds or with diverse linguistic productions
- to associate the intonation pattern with the hand movement and with the punctuation signs
- to read with intonation texts and poems.

Activities:

There can be organized activities and exercises for discriminating and identifying the main three intonation patterns: the rising one, the falling one and the neutral one. In order the three intonation patterns to be identified; they must be associated with different rhythmical structures, with hands' movements and with punctuation signs.

After those three intonation patterns can be differentiated by the children, they are to be associated with musical sounds and with different linguistic structures.

In order to be practiced the voice inflections by consolidating and automatizing those three intonation patterns, along with the situation when in the same sentence all of them can be present, thus being trained the mixed intonation pattern. These can be done by using short texts and poems, but also by using the role-plays and the short dialogued linguistic structures on different themes.

5. Knowing the notions of duration and intensity

Reference objectives:

- to differentiate between: long sound or word and short sound or word
- to differentiate between high and grave sound
- to associate the sounds with different emotions (joy, sadness, indifference, angry, boring etc.)
- to produce the onomatopoeia having into consideration those two notions: duration and intensity.

Activities:

Exercises through which it is established the differences between long and short, at the syllable and word level, and then at the level of the musical sounds. For example, there can be organized the following type of exercises: which word is longer "mac (poppy)" or "veverita (squirrel)"? This exercise can turn into a more complicated one if the child is asked to mention those two words syllables number. It has to be stressed on the co-articulation by offering the hearing impaired child the opportunity of a sustained training related to the increase of the verbal expression intelligibility level (being well known the fact that in the case of the

hearing impaired child the co-articulation problems are very serious, these types of problems being the object of the music classes too) (Anca, 2007).

In order to train the ability to differentiate long-short in the music classes there can be used the musical sounds. For instance, an activity sample can be the following: the child is asked to establish which of the two musical sounds are longer: miii or do, faaaa or sol etc. The teacher can also intonate the sounds with the minimum duration (the entire musical sound) and quaver duration (crotchet), after that he can ask the child to establish which of those is longer and which the shorter one is. The exercises through which it is trained the ability of the child to differentiate between a high sound and a grave one can be based both on musical sound and on other linguistic structures more and more complex. This aspect will ensure a continuous training of the child's hearing and speech, his rehabilitation being the focus of all the school activities he attends.

Thus, music can help the child train his phony-articulator apparatus in order to give him the chance to develop his communicative abilities. Through this type of approach of the sensory disabled child in the integrated education, it is ensured the building of the transversal competences both for the child, and for the teacher.

An extremely important activity is the one through which the child is supposed to make associations between the produced sounds and emotions. This type of activities can be organized very productively as a game, for instance, the game "the happy sheep and the sad one". This game consists in pronouncing the onomatopoeia through which the sheep is identified with a rising intonation pattern, pronunciation that can be associated with a positive emotion, with happiness, then with a falling intonation pattern, pronunciation that can be associated with a negative emotion, with sadness.

6. Language in use and role plays

Reference objectives:

- to develop the phonemic hearing and the phonemic awareness
- to compensate the hearing loss through musical games given visually and tactilely
- to associate a musical rhythm mostly visually and tactilely perceived with rhythmical movements and dancing
- to read and speak by characterizing suprasegmentally the verbal expression, through a proper intonation and stress.

Activities:

In order to be achieved those mentioned objectives there can be organized musical games and reading exercises paying attention to the intonation pattern. All these exercises can be based on musical sounds training too. In the following examples the stress is put on training on rhythmic structures the Romanian vowels, first isolated produced, then produced in a syllable:

e	mo
e	mi mu
e	me mă
e	ma mâ

Structure 1. Rhythmic formulas

Can be used short songs from the children`s folklore, songs such as; “Melc (snail), melc (snail)”, “Lună (Moon), Lună nouă (New Moon)” etc. These songs are used in the prenotation period, but also after that, when the sounds, the rhythmical formulas are learned, they being useful for the hearing impaired child in order to train and to stimulate his communication abilities.

Another type of exercises is the one that is based on reading short poems or different texts, the intonation pattern being properly produced.

The role-plays and the interpretation of short theatric representations through which the focus is on bringing together the hearing impaired child and the normal ones, are good opportunities for proving the disabled children`s abilities, not only their limits, ensuring their integration in the regular school.

7. Summative assessment

Reference objectives:

- to be valorized the every child`s abilities and acquisitions
- to be developed activities based on team work, team within which everyone has an important place
- to establish the educative coefficient through a dynamic evaluation

Activities:

At this level, all the children`s acquisitions can be put into practice by preparing and organizing a school celebration, a dancing event or a short musical play. Through this type of activity all child`s strengths can be valorized according to his aptitudes, his skills, as well as with his interests. The main didactic methods that can be used are the one that claim the team work and cooperation. Among these can be mentioned Philips 6.6, brainstorming, Synectics, brain- writing.

2. 4. Evaluation methods

The assessment can be done through practical probes, mainly, but also through oral and written tasks. The main forms of evaluation that are recommended to be used are: formative assessment, dynamic assessment and the assessment through which one can identify the child`s progress in comparison with his previous achievements. The normative assessment is not an option under the circumstance when it is promoted an integrated, inclusive education.

There also can be assessed the child`s productions, their work. Thus, there can be used as assessment ways short projects adapted as topic to the child`s

development level, based on drawings and music, projects that may focus on elements of music history caught in famous biography adapted for the children (Ekker; Eisenburger, 2006) or on the history of the musical instruments that the children are familiarized with.

3. Conclusions

This program for the school object “Musical Education” is build with the aim to facilitate the hearing impaired child’s optimal and functional integration in the regular school, in a moment when the reality of the Romanian school asks for it. There must be mentioned the fact that all the mentioned aspects presented within this program were analyzed, detailed and tested their functionality being proven as separate activities. The obtained results were compared with the results obtained by other researchers in this field (Robbins, 1980; McCord, Watts, 2006), thus it appeared this final version of the program. It is to be developed a wider testing of the entire program in order to be able to prove the efficiency of the program as well as to generalize the results to the entire Romanian population with hearing impairments integrated in the regular school from the first four grades.

An important aspect that must be taken into consideration is the one that this program may be adapt to the child’s needs, thus, the qualitative interpretation of the results is the most appropriate in order to be proven its strengths. The program can be improved by using the new technologies from the field. Thus it can be mentioned Shane Kerwin` s “Vibrato”, it allowing the hearing impaired person` s connection to it and tactilely, through vibrations perceiving music.

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ASPEKTE DER ZUSAMMENARBEIT MIT DEN ELTERN

RODICA POPESCU

ABSTRAKT. Aspekte der Zusammenarbeit mit den Eltern. Kooperation mit den Eltern und dem Kind ist in der Praxis leichter gesagt als getan. Eltern und Fachpersonen erfahren immer wieder Spannungsmomente und Verunsicherungen. Die Eltern erleben sich zwischen Fremdbestimmung und Selbstbestimmung, zwischen Normalität und Besonderheit. Die Eltern finden die gemeinsame Arbeit mit die Fachkräfte unterstützend und hilfreich. *Heutzutage ist in die Schule in Sibiu die Zusammenarbeit zwischen Eltern und Fachleute nahezu selbstverständlich geworden.*

Vorweg, möchte ich Eltern eines hörbehinderten Kindes zu Worte kommen lassen.

Erfahrungsbericht

Wir sind betroffene Eltern eines hochgradig hörgeschädigten Kindes.

Nachdem unser Kind als hörgeschädigt diagnostiziert wurde, hat sich unser ganzes Leben verändert/brach für uns eine Welt ein. Nichts war mehr wie vorher. Din meisten von uns haben einen Schock erlebt, als sie die Diagnose erfuhren, einen Schock mit verheerenden Folgen auf unser ganzes Familienleben. Es schien, als ginge die Welt unter, alles sei sinnlos, wir hatten begonnen, uns vor Freunden und Bekannten zu isolieren, wir hatten ein Problem, das wir nicht annehmen konnten.

Unser Kind war dasselbe, aber dennoch ein anderes. Bis dahin haben wir es wie ein normales Kind behandelt, aber auf einmal, wußten wir nicht mehr, wie wir uns verhalten sollen.

Wir erhielten eine Diagnose und ein Audiogramm, die wir nicht verstehen konnten. Wir haben uns etliche Fragen gestellt, auf die wir unglücklicherweise keine Antwort fanden. Wir hätten gerne gewußt, was die Hörschädigung unseres Kindes bedeutet, welches ihre Ursachen sind, welche Auswirkungen sie auf seine weitere Entwicklung haben, was wir jetzt für es tun können. Wir hätten gerne gewußt, welche Informationen ein Audiogramm enthält, was eine Hörschwelle und was ein schwerer Hörverlust bedeutet, was ein Hörgerät ist und wofür es dient, und nicht zu letzt, ob und wann unser Kind hören und sprechen kann.

Für uns war es eine besonderes lange Zeit, voller Zweifel, Unruhe, Sorge, zwischen Befunden, Audiogrammen und Versuche, das Kind mit einem Hörgerät zu versorgen. Wir erlebten der Reihe nach, Verzweiflung, Kraftlosigkeit, Pessimismus. Wir erwarteten ein Wunder, ein „etwas“, das uns den richtigen Weg weisen soll, den wir folgen sollen und das „etwas“ lies sich Zeit.

Alles schien verloren zu sein und wir kämpfen mit uns, die Situation anzunehmen, daß wir ein taubes Kind haben und nicht viel für es tun können. Und dennoch...

Wir erfuhren von der HNO-Klinik des Kinderkrankenhauses und der Schule für Hörgeschädigte Nr. 2 Sibiu/Hermannstadt. Skeptisch nahmen wir Verbindung zu Frau Dr. Dora Bacila (HNO-Fachärztin in der Klinik) auf, die uns Frau Prof. dr. Rodica Popescu, Schulleiterin, vorstellte und durch ihr Wohlwollen haben wir den Kindergarten und die Schule besucht. Die besonderen Bedingungen (vom Standpunkt der technischen und materiellen Ausstattung) sowie das hiesige Personal haben uns tief beeindruckt. Es wurde uns zugesichert, daß neben der Förderung unseres Kindes, die Eltern beraten werden, so daß wir uns entschließen, das Kind in den Sonderkindergarten innerhalb der Schule einzuschreiben.

Zum ersten Mal nach langer Zeit, wurden unsere Erwartungen und Hoffnungen erfüllt, haben Antworten auf unsere häufig gestellten Fragen erhalten, haben festgestellt, daß wir nicht allein sind, daß wir eine reele Hilfe in der Bildung und Entwicklung unseres Kindes erhalten, daß wir aktiv an seiner Rehabilitation mitwirken können und sollen.

In der HNO-Klinik erhielten wir Informationen über: die Struktur des Ohres, die Hörschädigung, ihre Ursachen, Grade und Typen.

Im Kindergarten/in der Schule hat uns das hiesige Team (Psychologe, Audiologe, Fachlehrer, Erzieherinnen) von Anfang an, Hilfe angeboten.

Der Audiologe hat uns gezeigt, wie ein Audiogramm ausgelegt wird, hat Hörgeräte angemessen dem Hörverlust empfohlen und uns erklärt, warum er diesen Hörgerät-Typen und nicht einen anderen ausgewählt hat, uns erklärt hat, was Hörgeräte sind (einschließlich Cochlea-Implantate) und welchen Gewinn sie jedem Kind bringen, wie sie funktionieren, wie sie überprüft und eingestellt werden (visuell und nach Gehör), wie man sie wartet, wie wichtig es ist, sie ständig zu tragen, aus welchen Gründen es die Kinder früher ablehnten, Hörgeräte zu tragen, wie einige Schwierigkeiten festgestellt und beseitigt werden. Wir wurden auch über die FM Systeme aufgeklärt.

Wir haben auch eine enge Beziehung zu den Erzieherinnen der Gruppe und zum Fachlehrer im Rahmen der Kinder-Eltern-Gruppe hergestellt. Die Arbeit innerhalb der Gruppe hat uns zum besseren Verstehen des „Problems“ unseres Kindes verholfen, gelehrt, wie wir mit ihm arbeiten sollen, uns möglichst normal verhalten, wenn es um seine Nöte geht, die ganze Verantwortung für seine Bildung und Erziehung übernehmen.

Der Begriff Rehabilitation, den wir immer wieder gehört haben und nicht genau wußten, was er bedeutet, wurde uns erklärt, es wurde unsere Rolle und unser Platz innerhalb dieses Prozesses gezeigt.

Wir haben gelernt, wie wichtig es ist, uns richtig dem hörgeschädigten Kind gegenüber zu verhalten und welches die realen Erwartungen zur Aneignung der verbalen Sprache sind.

Nachdem wir fast keine Information über die Hörschädigung hatten, wurden innerhalb der Gruppe Beratungssitzungen organisiert (anfangs nach Themen, die der

Fachlehrer ausgewählt hat, um später selber die Themen festzulegen, je nach Schwierigkeiten, die wir in der „Beziehung“ mit unserem Kind angetroffen haben).

Diese Gruppe hat uns ermöglicht, uns untereinander kennen zu lernen, Meinungen und Erfahrungen auszutauschen. Wir haben festgestellt, daß es auch andere Eltern in unsrer Situation gibt, die dasselbe empfunden hatten, die verzweifelt waren, die keine Zukunft für ihr Kind sahen. Im Laufe der Zeit haben wir uns durch die Gruppenarbeit gegenseitig unterstützt und uns an den Erfolgen unserer Kinder erfreut. Wir haben verstanden, daß jedes hörgeschädigte Kind, das richtig mit Hörgeräten versorgt und in ein Rehabilitationsprogramm eingeschlossen wurde, durch unseren bedingungslosen Beistand sowie der der Hörgeschädigtenpädagogen, eine ähnliche Entwicklung wie ein guthörendes Kind haben kann.

Wir haben uns Rechenschaft gegeben, wie wichtig eine korrekte Versorgung mit Hörgeräten ist, sie schafft jedoch keine Wunder, wir müssen mit viel Ausdauer mit dem Kind arbeiten, ihm immer nahe sein, ihn geduldig und mit Optimismus auf seinem langen Weg der Entschlüsselung der „Welt der Guthörenden“ begleiten, ihm verhelfen zu verstehen, woher die Töne kommen, was jedes Wort bedeutet und wie wichtig die mündlichliche Kommunikation für ihn ist.

Wir haben gelernt, mit dem Kind zu kommunizieren (nicht nur theoretisch, sondern auch praktisch, und werden „korrigiert“, wenn wir „fehlen“), welche Regeln wir beachten sollen, wie wir mit ihm sprechen sollen, welche Kommunikationsart wir angehen sollen. Indem wir effektiv mit dem Kind arbeiten, hat sich unsere Beziehung gebessert und es ist uns letztendlich gelungen, einen perfekten Binom/zweigliedrige Größe zu bilden.

Nachdem wir aktive Partner im Rehabilitationprozeß wurden, erschreckt uns unsere Lage als Eltern von hörgeschädigten Kindern nicht mehr. Wir haben „gelernt“, daß wir uns für jeden „Erfolg“ freuen sollen, es mit ihm selbst vergleichen sollen, seinen Kräften vertrauen, ihn ständig ermutigen.

Die seelische Stütze, die ständige Beratung und die Informationen, die wir erhielten, haben uns überzeugt, daß es die richtige Wahl für unser Kind und uns war.

Die Schulleiterin Frau Director Prof. Dr. Rodica Popescu, die Erleichterungen, die Lehrkräfte und das Hilfspersonal, die gute Zusammenarbeit zwischen Schule und Facharzt der HNO-Klinik, der angebotene Beistand, haben uns überzeugt, daß wir zur rechten Zeit an die richtige Stelle gelangt sind.

Jetzt, wo wir den Frust und Ärger überwältigt haben, unser Kind begleiten, es lehren und mit ihm lernen, möchten wir auch anderen Eltern, die ein hörgeschädigtes Kind haben, helfen, ihre Minderwertigkeitsgefühle abzubauen, da ein taubes Kind ihnen viel Freude bringen kann.

Anbetracht unserer Erfahrung, wünschen wir, daß die Zeit der Verzweiflung und des Frustes für andere Eltern nicht so lange anhalten soll. Die Ärzte sollten dieser Schädigung eine größere Bedeutung beimessen und sie frühzeitig diagnostizieren. Die Auswahl der Kinder, die der Risiko-Gruppe angehören, infolge des Hörscreenings, wäre für uns Eltern sehr hilfreich, würde uns zeitig auf die Bewältigung der Situation als Eltern mit einem hörgeschädigten Kind vorbereiten. Wir würden Zeit gewinnen,

und bis zu einer eventuellen Bestätigung der Diagnose, könnten wir uns über die Hörgeschädigung und ihre Auswirkungen informieren/erkundigen.

Der einfache Name der Diagnose erschrickt uns. Wir wären dankbar, wenn man uns geduldig und verständlich erklären würde, welches der Hörmechanismus ist, was Hörschädigung bedeutet, was man in diesem Fall unternehmen kann, wer uns helfen kann, was ein Hörgerät ist, wer es uns liefern kann, was ein Cochlea Implantat bedeutet, welches die Risiken dieser Operation darstellen, wie wir und unsere Kinder uns auf den chirurgischen Eingriff und postoperatorische Zeit einstellen/vorbereiten sollen.

Wir treffen eine Reihe von Begriffen an, die wir nicht verstehen und die uns einängstigen und haben manchmal unverständlicherweise Angst, Erklärungen zu verlangen. Es wäre für uns viel einfacher, wenn der Audiologe uns erklären würde, was eine korrekte Versorgung mit Hörgeräten bedeutet, welches der Unterschied zwischen den analogen und digitalen Hörgeräten ist, wie der Ton bearbeitet wird, wie das Cochlea Implantat funktioniert.

Die Krankenkasse sollte für die gesamten Kosten der Versorgung mit Hörgeräten der Kinder aufkommen, so wie es in anderen Ländern geschieht. Für viele von uns ist es unmöglich, die Differenz für die Hörgeräte zu begleichen, so daß die Eltern trotz Empfehlung eines Hörgerätes (wegen Hörverlust), keines anschaffen können. In den meisten Fällen gehen wir einen Kompromis ein, kaufen „billigere“ Hörgeräte, um später festzustellen, daß sie für unser Kind nicht gewinnbringend sind.

Von den Erziehern erwarten wir Anleitungen zur Rehabilitation unseres Kindes, möchten gerne die Bedeutung des Verhaltens und der Haltung unseres Kindes kennen, welches die Anzeichen der erfolgreichen Arbeit sind - oder im Gegenteil- welches die Alarmzeichen sind, uns möglichst viele Übungsmodelle und Arbeitmethoden mit dem Kind überliefern, so wie es der Fall in der Schule in Sibiu ist, die ein Muster in allen Hinsichten ist.

Vom pädagogischen Standpunkt sind wir der Meinung, daß alle Schule das Modell aus Sibiu übernehmen sollten, mit der neuen Art und Weise Hörbeschädigung anzugehen und mit den Eltern zusammenzuarbeiten, damit die Familien der hörgeschädigten Kinder nicht mehr aus Ploiesti, Tulcea, Bistrita, Baia Mare usw. umsiedeln müssen, ein Phänomen, das man immer häufiger antrifft, das aber so viele finanzielle und nervliche Verausgabung voraussetzt.

Wir wünschen, daß die Fachleute uns zu ihren Partnern/Mitarbeitern zählen, uns geduldig Zeit widmen aber vor allem Vertrauen, uns eine Reihe von „Phänomen“ erklärt, die wir nicht verstehen und die uns beängstigen (V.und M.Z., 2002)

Die Notwendigkeit einer Zusammenarbeit

Nicht nur diese Eltern finden die gemeinsame Arbeit mit die Fachkräfte unterstützend und hilfreich; heutzutage ist in unsere Schule die Zusammenarbeit zwischen Eltern und Fachkräfte nahezu selbsterklärend geworden. Der Einbezug der Eltern in die Förderung hörgeschädigter Kinder ist schlussendlich eine unabdingbare Voraussetzung für die Wirksamkeit derselben.

Wird ein hörgeschädigtes Kind in eine "hörende" Familie ohne Erfahrungen mit Hörschädigten hineingeboren, ist es vorerst wohlbehütet eingebettet im Familiensystem. Es erhält alle elterliche Liebe, geborgenheit und Zuwendung (Böhler-Kreitlow, 2000)

Bis zum Zeitpunkt der Diagnosemitteilung haben die Eltern kein Wissen über die akustische Isolierung und damit verbundenen anderen und/oder zusätzlichen Bedürfnisse ihres Kindes.

Zusätzlich, erleben die Eltern einen starken Einbruch in ihr gewohntes Leben, ihre Lebensperspektiven und ihr Selbstverständnis. Zu diesem Zeitpunkt, braucht nicht nur das Kind Unterstützung, auch die Eltern benötigen natürlicherweise Hilfe in Form einer intensiven Beratung und Begleitung zur Bewältigung des Alltags mit ihrem hörgeschädigten Kind.

Wird die Diagnose "Hörschädigung" bei einem Kleinkind mitgeteilt, fühlen sich Eltern und auch Früherzieherinnen zu einem schnellen handeln aufgerufen: dem Kind muss so rasch als möglich Unterstützung angeboten werden. In dieser "Notfallsituation" finden zwar die Bedürfnisse des Kindes Berücksichtigung, *die Bedürfnisse der Eltern* dagegen gehen oftmals verloren. Sie erhalten von den Fachleuten zeitraubende und ihnen unbekannte kindbezogene Förderaufgaben, aber zu wenig bewusst angebotene zeitliche Freiräume für die so notwendige Verarbeitungs- und Trauerphase.

Oftmals ist eine ergänzende therapeutische Beratung für die Eltern nicht nur angezeigt, sondern äusserst notwendig! Sie müssen ihren Schock über die Behinderung ihres Kindes verarbeiten können, um die in Zukunft anstehenden Betreuungsaufgaben erfüllen zu können (Böhler-Kreitlow, 2000).

Frühbetreuung kann nur gewinnbringend für die Familie und das hörgeschädigte Kind sein, wenn die Interventionen nicht ausschliesslich kindorientiert sind. Das beinhaltet eine offene und ehrliche Zusammenarbeit aller an der Frühförderung Beteiligten. Obwohl diese Erkenntnisse weit verbreitet sind und somit als Zielvorstellung in fast jeder Frühbetreuungsarbeit als vorrangig gelten, wird der zu begehende gemeinsame Weg immer wieder als schwierig, steinig und oftmals unbefriedigend beschrieben.

Damit die Elternberatung nicht zu einseitig von den Erfahrungen und der persönlichen Haltung der Fachpersonen geprägt wird, benötigen diese *in Wechselwirkung das Sich-Eingeben der Eltern*, oftmals speziell das der Mutter. Eltern erleben ihre Kinder unter anderen Voraussetzungen und in anderen Bezügen als wir, so das wir stets auf der Hut sein müssen, unsere Erfahrungen mit den Kindern nicht automatisch zur maxime zu erheben und zu versuchen, sie den Eltern quasi als Musterexemplar eines Erziehungsratgebers aufs Auge zu drücken (Hintermair, 1992).

Die elterlichen Kompetenzen und Erfahrungen beinhalten eine der grössten Chancen für die Entwicklung der kindbezogenen Möglichkeiten und Fähigkeiten. Je bewusster sich die Eltern um ihr Wissen über ihr hörgeschädigtes Kind sind, desto gezielter können sie sich in das Fördergeschehen eingeben. Elternkompetenz, wie Fachkompetenz sollten gleichgewichtig zum tragen kommen.

Für keines der Kinder ergeben sich Rezepte, dagegen werden für jedes einzelne Kind prezessartig individuelle Fördermöglichkeiten mit den Eltern "entworfen".

Für die Zusammenarbeit mit den Eltern werden immer neue und auch unterschiedliche Begriffe verwendet: Elternarbeit, Elternbegleitung, Elternberatung, Elterntraining, Familientherapie, Elternanleitung....Obwohl einige der Fachpersonen bei der Verwendung dieser Bezeichnungen sicher das gleiche meinen, kommen wir nicht darum herum, inhaltlich erhebliche Unterschiede festzustellen.

Unterstützen Fachpersonen und Eltern auf partnerschaftlicher Ebene das hörgeschädigte Kind in seiner Entwicklung, sind *Elternarbeit*, *Elterntraining* und *Elternanleitung* sicher nicht die geeigneten Bezeichnungen. Sie implizieren ein hierarchisches Gefälle innerhalb der gemeinsamen Arbeit. Sie zeigen auf, dass die Früherzieherinnen:

- ihren Auftrag darin sehen, die Eltern zu belehren, ihren Horizont zu erweitern, wie weiterzubilden
- die Erwartung hegen, dass die Eltern die angebotenen Theratievorschläge zu hause in gleichen Sinne weiterführen.

Kooperationsformen mit den Elter

Elternabende werden von den meisten Frühbetreuungsstellen durchgeführt. Hiermit erhalten die Eltern die Chance einer breiten Wissensvermittlung durch neue, ergänzende und zusätzliche Anregungen, Impulse und fachliche Auseinandersetzungen.

Literatur: Eltern haben oftmals keine oder wenig Erfahrungen und Möglichkeiten an die für sie interessante/weiterführende Fachliteratur zu gelangen. Die Abgabe verschiedener *Lese-Mapen* zu spezielle Themenbereichen wie z.B.: Hörgeräteanpassung, Methoden, Integration, allgemeine Tagungsberichte, Erfahrungsberichte von Betroffenen ... bringen sicher eine Bereicherung.

Eltern-Kind-Gruppe: nachdem wir erkannt haben, wie wichtig die Partnerschaft mit den Eltern in der Rehabilitation ihrer Kinder ist, wurden in unserer Schule Ende des Jahres 2000 nach dem Stegener Modell die „Eltern-Kind-Gruppen“ (EKG) gebildet.

a) Die EKG bieten den Kindern

- Frühförderung, um die Kommunikationsfähigkeiten auszubilden;
- Hörtraining;
- rhythmische Erziehung;
- Entwicklung aller Sinne;
- Entwicklung der gesamten Persönlichkeit des Kindes.

b) Die EKG bieten den Eltern:

- Beratungen und Aufklärungen zur Hörschädigung, ihre Auswirkungen auf das eigene Kind und dessen beste Förderung;
- Informationen über das Hörgerät/CI, wie es funktioniert, wie es überprüft wird, wie man es wartet, wie lange es tagsüber getragen werden muss, wieviel ein Kind mit dem Hörgerät/CI hört;

- Modelle für Rehabilitations- und Unterrichtshilfen;
- Klärung individueller Besonderheiten;
- Erweiterung der eigenen Erfahrung und Erhöhung der Sicherheit bei der Kommunikation mit dem eigenen Kind;
- Erfahrungsaustausch mit den anderen Eltern
- effektive Teilnahme an der Rehabilitation des Kindes;
- Diskussion von Lösungen für eine entsprechende Förderung, Rehabilitation und Entwicklung der Kinder innerhalb der Familie.

c) Die EKG sind:

- zweimal monatlich, freitags, und ein Elternteil oder beide Eltern nehmen teil;

d) Die EKG orientieren sich:

- bei der Planung, Vorbereitung und Ausführung der Tätigkeiten an dem Entwicklungsgrad und der Kommunikationsfähigkeit der Kinder und des erzielten Fortschrittes und die Themen werden nach dem Alter der Kinder, der persönlichen Erfahrung, der Jahreszeit sowie der Familienergebnisse ausgewählt.

- Dabei umfassen die Tätigkeiten das Begrüßen der Eltern, die Überprüfung der Hörgeräte, Hörtraining, das Erzählen ausgewählter Themen, themengemäße Rhythmik, freies Spielen sowie Besprechungen mit den einzelnen Eltern wie auch der Eltern untereinander (Popescu, 2004)

Die Eltern werden nicht im Sinne von „Co-Therapeuten“ zur Umsetzung einer von den Fachpädagogen vorgegebenen Rezeptur angeleitet, vielmehr wird ihre natürliche Elternkompetenzen unterstützt. Es geht nicht darum, dass eine Familie eine allgemeine gültige Methode umsetzt, sondern es gilt, die in der jeweiligen Familie vorliegenden Kommunikations- und Interaktionsformen so zu beeinflussen, dass daraus gute Hör- und Sprachentwicklungsbedingungen für das hörgeschädigte Kind erwachsen.

Die Veränderungen in unserer Schule finden bei den Eltern eine überaus große Resonanz und Anerkennung. Sie sind vermehrt bereit, sich zu engagieren und mitzuarbeiten, bemühen sich selbst um die bestmögliche Hörgeräteversorgung und zahlen auch für ein Hörgerät bzw. das CI. Es ist eine vertrauensvolle Partnerschaft entstanden, weil wir uns gemeinsam um die bestmögliche Förderung des Kindes bemühen. Die veränderten Methoden haben sich herumgesprochen und viele Eltern sind deshalb hierher nach Sibiu umgezogen. Wir haben inzwischen Schüler aus dem ganzen Land.

Die jüngsten Kinder in unserer Betreuung sind momentan 1,8 und 2,2 Jahre alt.

Eltern als Partner

Während der Frühförderzeit ist der Kontakt zwischen Eltern und den so genannten Fachleuten relativ eng. Dies ändert sich häufig mit Eintritt in die Schule. Einerseits ist das Anliegen der Eltern, nun einen Teil der Verantwortung in andere Hände zu legen, verständlich und richtig. Andererseits sind Kinder und Lehrkräfte

nach wie vor auf deren Unterstützung angewiesen, soll die Entwicklung weiterhin gut voranschreiten.

Wenn sich zu Beginn der Schulzeit die Kommunikation mit dem Kind aufgrund von Verständigungsproblemen noch schwierig gestaltet, sind gerade das Wissen um die privaten Lebensbedingungen und der regelmäßige Austausch mit den Eltern wichtig, um das Kind zu verstehen, seine Äußerungen richtig zu interpretieren.

Eine Familie mit einem hörbehinderten Kind befindet sich zwar in einer Ausnahmesituation, ist aber nicht grundsätzlich behindert oder in ihrer Funktion gestört. Sie ist zuallererst eine „normale“ Familie, die durch ein vorübergehendes Ungleichgewicht und durch die Bewältigung ihrer ganz speziellen Aufgaben zu einer „besonderen“ Familie *wird*. Eine der Erschwernisse macht das breitgefächerte Angebot von therapeutischen und pädagogischen Fördermöglichkeiten aus. Sie wirken auf die Eltern nicht nur erleichternd, sondern können auch eine Überforderung auslösen.

Den Eltern möchte ich empfehlen, sich folgende Gedanken zu machen:

- Was erhoffen Sie für die Zukunft Ihres Kindes?
- Sind Ihre Wunschvorstellungen einigermaßen realistisch?
- Entsprechen die Erwartungen auch den Bedürfnissen und Fähigkeiten des Kindes?
- Nehmen Sie Kontakt auf zu anderen betroffenen Familien!
- Lassen Sie sich nicht drängen, versuchen Sie selber zu spüren, was und zu welchem Zeitpunkt etwas für Ihr Kind richtig ist!
- Versuchen Sie offen und ehrlich mit den Fachpersonen zu diskutieren; äussern Sie auch die geheimsten Wünsche, Vorstellungen, Befürchtungen und Ängste!
- Eltern bleiben müssen!

Zusammenarbeit mit den Eltern – kein Problem?

Im Alltag findet die Aussage: „*Die Praxis leidet an den menschlichen Schwächen*“ (Jetter, 1994) immer wieder ihre Bestätigung.

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THE SEMIOTIC PERSPECTIVE ON SIGN LANGUAGE

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ABSTRAKT. In diesem Artikel werden erstens die theoretischen und pragmatischen Überlegungen der semiotischen beziehungsweise post-semiotischen Methode kurz aufgeführt, wobei der Schwerpunkt auf der Darstellung der Gebärdensprache anhand Cuxac's Semiogenetisches Modell für die Analyse der Gebärdensprachen liegt.

Diesem Ansichtspunkt folgend wird weiterhin mit Hilfe einiger Schlüsselbegriffe erörtert, auf welcher Art in der Gebärdensprache Sinn erbaut und erfasst wird so wie auch die Tragweite der, Gebärdensprachen weitgehend[†] beeinflussenden, kognitiven Ikonizität dargestellt. Sprachwissenschaftliche Studien haben ergeben, dass Gebärdensprachen eine komplexe phonetische, morphologische und syntaktische Struktur aufweisen und dass sich die wesentlichen Merkmale auf Gleichzeitigkeit und Ikonizität beruhen. Demzufolge wird auch die in der Gebärdensprache nachgewiesene Theorie über kognitive Ikonizität des Wissenschaftlers Wilcox beschrieben.

Indem die einzelnen Gebärden bestimmte Ähnlichkeiten mit dem Begriff auf den sich sie beziehen aufzeigen, wird Gebärdensprache schon seit langem als überaus ikonisch betrachtet. Jedoch wurde erst in den letzten zehn Jahren eine systematische Analyse der ikonischen und metaphorischen Gebärden vorgenommen. Der Überblick über die Forschung von ASL den dieses Werk bietet kann als Förderung für künftige Forschungsarbeiten im Bereich der Rumänischen Gebärdensprache betrachtet werden.

SCHLAGWORTER: Semiotik, Gebärdensprache, Kommunikation, kognitive Ikonizität, Metaphern in ASL

Theoretical background

The semiotic approach considers communication as a mutual negotiation of meaning and explains how communication is more than a linear transfer of messages from transmitter to receiver. The notion of 'meaning-construction' has been influential in the study of media and communication. The semiotic theorists Saussure, Peirce, Morris and Barthes described the concepts of the 'sign', 'the signifier', and 'the signified'. The Swiss linguist Ferdinand de Saussure is considered the founder of semiotics (in his *Course in General Linguistics*, 1916) and other key figures in the early development of semiotics were the American philosopher Charles Sanders Peirce and later Charles William Morris, who developed a

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behaviourist semiotics. Leading modern semiotic theorists include Roland Barthes, Algirdas Greimas, Yuri Lotman, Christian Metz, Umberto Eco and Julia Kristeva. A number of linguists other than Saussure have worked within a semiotic framework, such as Louis Hjelmslev and Roman Jakobson. They engage in a search for ‘deep structures’ underlying the ‘surface features’ of phenomena. However, contemporary social semiotics has moved beyond the structuralist concern with the internal relations of parts within a self-contained system, seeking to explore the use of signs in specific social situations. *Semeiotics* (Greek: σημειωτικός, *semeiotikos*, an interpreter of signs) was first used in English by Henry Stubbes.

Semiotics is the study of sign processes (semiosis), or signification and communication, signs and symbols, both individually and grouped into sign systems. It includes the study of how meaning is constructed and understood. Scholars have seen the origin of language as continuous with the origin of signs. Charles W. Morris (1901–1979) in his 1938 *Foundations of the Theory of Signs*, defined semiotics as grouping the triad syntax, semantics, and pragmatics. Syntax studies the interrelation of the signs, without regard to meaning. Semantics studies the relation between the signs and the objects to which they apply. Pragmatics studies the relation between the sign system and its human (or animal) user. Currently, modern structuralist-formalist linguistic theory encourages us to sever the link between the origin of signs and the origin of language, to the point where some linguists have proposed that there is an evolutionary gap between communication and language, bridged only by some “miraculous” genetic mutation which left us with linguistic ability (Wilcox, 2000).

John Stewart in 1995 builds upon concepts of language articulated by Heidegger, Buber, Gadamer, and Bakhtin to configure his version of a post-semiotics approach. Stewart constructs a “holistic” method of analysis for post-semiotics as opposed to the atomistic approach he aligns with semiotics. Scot Simpkins, 1995, mentioned that a significant component of Stewart’s concept of the post-semiotics (or, what he calls “constitutive articulate contact”) is the contention that “understanding is a mode of being manifested in concrete events of conversing and that ultimately these events are what the term language labels”. The “efforts to analyze syntactic or semantic aspects of what has been viewed as the ‘system’ of language need to be broadened to acknowledge both the indivisible interrelationships between the verbal and the nonverbal and the inherently relational nature of events of articulate contact”. From this perspective, a sign “system” such as language needs to be approached from the perspective of understanding the events of communication.

As Jacques Souriau mentioned in “Co-creating Communication” (2006), language is an unstable object that scientists try to grasp and that somehow escapes their hands. Language can be studied either as an external object by ignoring all the variations that take place through historical changes and actual dialogical uses (synchrony) or as a complex and dynamic activity which is both social and

individual and undergoes historical changes (diachronic). Saussure chose to stick to a synchronic approach (“langue” instead of “parole”) as being easier to study (following Descartes who thought that only corpses can be dissected) and this structural approach dominated linguistics studies for many years. However, when it comes to meaning in language, Saussure suggested that “semiotics should be a science of social psychology” (quoted by Ivana Markova, 2003). The Simpkins commentary on Sign language is based on Susan Dyer surveys that showed different theories of language describing three education approaches for the deaf: oralism (spoken English), combinism (spoken English and Sign), and bilingualism (Sign and ESL). Oralism and combinism, they observe, rely upon symbol-based models of language while bilingualism incorporates the type of articulate contact. Stewart promotes in this study through the belief that „members of deaf culture function best socially by utilizing their natural facial, gestural, and bodily communicative resources, thereby adapting to their deafness rather than attempting to overcome it”

Particularities of Sign Language

Sign language is a language which uses manual communication, body language and lip patterns instead of sound to convey meaning, simultaneously combining hand shapes, orientation and movement of the hands, arms or body, and facial expressions to express fluidly a speaker’s thoughts. Sign languages commonly develop in deaf communities, which can include interpreters and friends and families of deaf people as well as people who are deaf or hard of hearing themselves. As is the case of spoken language, sign language differs from one region to another. However, when people using different signed languages meet, communication is significantly easier than when people of different spoken languages meet. Sign language, in this respect, gives access to an international deaf community. Sign language is however not universal, and many different sign languages exist and are mostly mutually unintelligible. Generally, each spoken language has a sign language counterpart in as much as each linguistic population will contain Deaf members who will generate a sign language. In much the same way that geographical or cultural forces will isolate populations and lead to the generation of different and distinct spoken languages, the same forces operate on signed languages and so they tend to maintain their identities through time in roughly the same areas of influence as the local spoken languages. This occurs even though sign languages have no relation to the spoken languages of the lands in which they arise. There are notable exceptions to this pattern, however, as some geographic regions sharing a spoken language have multiple, unrelated signed languages. Variations within a “national” sign language can usually be correlated to the geographic location of residential schools for the deaf.

The written history of sign language began in the 17th century in Spain. In 1620, Juan Pablo Bonet published *Reducción de las letras y arte para enseñar a hablar a los mudos* (“*Reduction of letters and art for teaching mute people to speak*”)

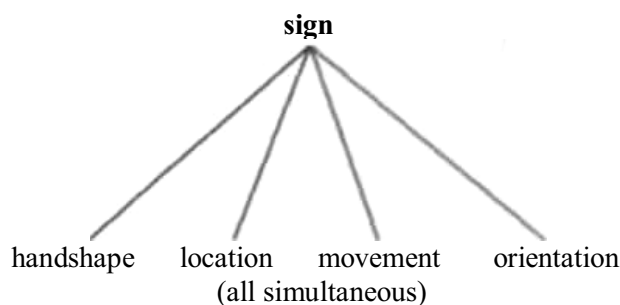
in Madrid. It is considered the first modern treaty of Phonetics and Logopedia, setting out a method of oral education for the deaf people by means of the use of manual signs, in form of a manual alphabet to improve the communication of the dumb or deaf people. From the language of signs of Bonet, Charles-Michel de l'Épée published his alphabet in the 18th century, which has arrived basically unchanged until the present time. In 1755, Abbé de l'Épée founded the first public school for deaf children in Paris; Laurent Clerc was arguably its most famous graduate. He went to the United States with Thomas Hopkins Gallaudet to found the American School for the Deaf in Hartford, Connecticut. Gallaudet's son, Edward Miner Gallaudet founded the first college for the deaf in 1857, which in 1864 became Gallaudet University in Washington, DC, the only Liberal Arts University for the Deaf in the world.

According to some materials issued by Romanian National Association of the Deaf (ANSR), in Romania, the first testimonies on deaf people are some documents that date back to the 15th century during the reigns of Ștefan the Great, Petru Rareș, Matei Basarab and Vasile Lupu. Apparently, Băcilă, a cavalry officer was the first to establish and lead a private institute for deaf people at Dumbrăveni between 1827-1831 and 1846. The first school for deaf people was founded in 1863 in Bucharest by Doctor Carol Davilla. The legal recognition of Romanian Sign Language as the native language of deaf Romanians was in the law 519/2002 and underlined also in 448/2006. This fact is symbolic for the deaf community because shows respect for their native language but we need more works about getting practical recognized that Romanian Sign Language is a unique language with clear particularities and with the strong need of implementing interpreting as a profession that can facilitate the access to the information that the deaf people need.

Sign languages are as rich and complex as any oral language, despite the common misconception that they are not "real languages". Professional linguists have studied many sign languages and found them to have every linguistic component required to be classed as true languages. Sign languages are not pantomime - in other words, signs are largely arbitrary and have no necessary visual relationship to their referent, much as most spoken language is not onomatopoeic. Nor are they a visual rendition of an oral language. They have complex grammars of their own, and can be used to discuss any topic, from the simple and concrete to the lofty and abstract. Sign languages, like oral languages, organize elementary, meaningless units (phonemes; once called cheremes in the case of sign languages) into meaningful semantic units.

Stokoe (1960) was the first linguist to analyze signs considering meaningless parts that he called „cheremes” which most linguists now call phonemes. The difference between spoken and signed languages Stokoe pointed out, is that the phonemes in the former are sequential, while in the latter they appear to simultaneous. Stokoe grouped his phonemes in three types: active handshapes (what moves), location (on face, body, or another hand), and movement. Later,

orientation (the way that hands point or face or interact with each other) was added as a fourth phoneme type (Battison, 1978):



William Stokoe he was instrumental in changing the perception of American Sign Language from that of a broken or simplified version of English to that of a complex and thriving natural language in its own right with an independent syntax and grammar as functional and powerful as any found in the spoken languages of the world. Because he raised the prestige of ASL in academic and educational circles, he is considered a hero in the Deaf community.

Currently, we consider that the elements of a sign are **H**andshape (or Handform), **O**rientation (or Palm Orientation), **L**ocation (or Place of Articulation), **M**ovement, and Non-manual markers (or Facial Expression), summarized in the acronym **HOLME**.

One unique characteristic of Sign Language is the iconicity. For many years iconicity in signed languages was regarded as a feature which detracted from their status as fully developed human languages. In a series of studies Wilcox developed a model of iconicity based on cognitive linguistics which recognizes its pervasiveness both in the lexicon and the grammar. According to this model, iconicity is a property of the geometry of conceptual spaces in which both phonological and semantic structures reside: iconicity is a characteristic of this situations in which the phonological pole of a symbolic unit resides in close proximity in conceptual space to the semantic pole. Thus, from this cognitive perspective, iconicity is a mapping across domains in conceptual space.

A Semiogenetic Model to Analyze Signed Languages

The semiogenetic model proposed by Cuxac (2001) assumes that because Sign Language in actual use (taking into account different levels of performance and competence) utilize a visuo-gestural modality, they share the following formal and functional characteristics:

☞ These languages emerge through the same cognitive process—iconization of experiential devices—tied to the world of practical action and to a semiotic communicative intentionality.

☞ Two structural semiotic branches develop out of this initial process of iconization and are observable in the subsequent evolution of these languages. On the one hand, a *nonillustrative intent* converges on a categorical perspective that consists of “telling without showing,” giving rise to lexically stabilized forms. On the other hand, an *illustrative intent* makes visible everything that is being said, “telling while showing” through highly iconic structures (HIS) and giving rise to what is known as transfer structures. The model identifies three principal types of transfers:

1. form and size transfers involving parametrical components (proforms handshapes, movement, and facial expressions) that describe animate or inanimate entities in relation to their size or form

2. situational transfers (ST) involving two hands expressing a process by an entity (dominant hand) in relation to a stable locative or a point of reference (nondominant hand) to convey an utterance

3. personal transfers (PT) involving a role (agent or patient) and a process; signers “become” the entity they are referring to

These structures are the visible traces of cognitive operations that transfer references into the sign space of discourse. Three types of iconicity: imagistic, diagrammatic and degraded are involved in the structural relationship between these two branches (Cuxac 2004). In French SL, these three categories of transfers can be combined in discourse and attain a complex level of linguistic organization into more than twenty structural categories (Sallandre 2003).

These two branches carry on formal and functional relationships at different linguistic levels: morphological, syntactic, semantic, and discourse.

☞ At the level of internal structure, all signed languages have at least two fundamental components: semantic specialization of parameters and meaningful use of space (i.e., a visual-spatial grammar) (Cuxac 2000; Liddell 2003).

This model leads to a theoretical framework that enables us to study the structural and functional relationships among different kinds of Sign Languages. By taking into account certain factors (social integration, communicative and institutional history), the model postulates the possibility of (a) placing various kinds of Sign Languages currently in use throughout the world on an evolutionary continuum, and (b) providing for synchronic, as well as diachronic, analyses of Sign Languages used at the individual (ontogenetic) or group (phylogenetic) level.

Three different evolutionary levels are evident.

The Ontogenetic Level

This level includes gestural systems of communication such as home-signs, which are created initially by deaf children raised by hearing families (Volterra and Erting 1994; Goldin-Meadow 2003). These systems may undergo structural

ontogenetic evolution and become Emergent Sign Languages (Fusellier-Souza 2001, 2004) when they continue to be used by deaf adolescents (Morford 1996, 2003) and adults (Kuschel 1973; Kendon 1980; Yau 1992) living at a distance from deaf communities and having a social role in hearing societies that have positive attitudes toward gestural communication.

The Phylogenetic Level

This level includes Sign Languages involved in community use along two dimensions. On the one hand, noninstitutional signed languages are used in microcommunity settings by small groups of deaf individuals (Jirou 2000; Schmalig 2001; Nyst 2003; Sandler and al. 2005). On the other hand, numerous signed languages are used in macrocommunity settings and have institutional histories during at least two distinct periods:

- those with a long historical base, beginning with the educational systems put in place by the Abbe de l’Epee in France in the eighteenth century (the signed languages of Europe, the Americas, and some Asian countries)
- more recently (arising during the last thirty years), those used in countries or regions with little institutional history (Currently, there is scientific literature on three cases of emerging institutional sign languages: in Nicaragua [Kegl et al. 1999], in Tunisia [at Douz] [Pizzuto 2001], and on the island of Mauritius [Gebert 2003; Adone 2004].)

The Level of Exolingvistic Communication

This level includes gestural communication used spontaneously (with no community basis and no history of diachronic evolution) between deaf people of different nationalities. The scientific literature calls this kind of Sign Language “international sign language.”

In his works, Christian Cuxac focuses on three features of sign languages:

- Sign Languages not only ‘say’ but simultaneously ‘show’: their linguistic ‘spread’ is therefore greater than oral languages
- The quadridimensional nature of Sign Languages gives them a remarkable stability. They are less subject to diachronic change than Oral Languages and show striking similarities between each other.
- In addition to standard signs, sign languages use global-synthetic gestures that Cuxac calls “structures of large iconicity”. They take the form of transfers of an image into a part of the totality of the body:

The structures of large iconicity can be combined and form a grammar similar to cinema. Very often, standard signs introduce topics and Units or large iconicity expresses the comments (not in 100% of cases). In other words, sign languages cannot be reduced to sequences of standard signs. In many cases, utterances in sign languages could not be understood using only standard signs. There are two complementary types of gestures: standard signs that are the equivalent of spoken

words and units of large iconicity that are the equivalent of gestures accompanying spoken words.

The ways gestures are produced in oral languages and sign languages illustrate both the variability and the structural similarity of languages. They also manifest the creativity of the communities of speakers.

Another aspect of gestures in sign languages is that they are produced in a space which is not only the physical place where a conversation takes place, but also the space that utterances refer to. Liddell (2000) suggests that the space where a story takes place (grounded surrogate space) and the space where the conversation takes place (the real space) are blended, so that a new space is created where the enunciation is organised. All the gestures that refer to the elements of the story are directed to specific locations in this space as if the characters and objects of the story were present.

A short review on some of the recent works about cognitive iconicity and metaphors in Signed Languages

While sign languages (SLs) have long been recognized as being highly iconic, with signs bearing some kind of resemblance to the concepts they refer to, it is only within the last 5-10 years that the nature and interplay of iconic and metaphorical signs have been systematically examined.

Sarah Lind, 2003, mentioned that with the advent of functional and cognitive linguistics, sign linguists found a more congenial framework to work in one that allowed unapologetic exploration of all aspects of the languages they studied and in particular the relationship between form and meaning. Functionalists were beginning to look seriously at the role of iconicity in languages in general (e.g., Haiman, Givón), and cognitive linguistics viewed “form and meaning as integrated on every level of linguistic structure” making it “well suited for treating issues of linguistic motivation” (Taub, 2001). At the same time, Lakoff and Johnson’s work on conceptual metaphor introduced a way of thinking about metaphor that involved issues of iconicity.

These developments contributed to the intense and productive attention to iconicity and metaphor in SLs in the 90s. The list of references shows work in Japanese Sign Language (Ogawa, Herlofsky, and Veale), British Sign Language (Brennan, Woll), Italian Sign Language (Pietrandrea, Pizzuto, et al., Cameracanna, Russo), French Sign Language (Bouvet), and ASL (S.Wilcox, Emmorey, Grushkin, Marschark, Wilbur, Okrent, O’Brien).

Phyllis Wilcox’s in *Metaphor in American Sign Language* (2000) and Sarah Taub’s in *Language from the Body: Iconicity and Metaphor in American Sign Language* (2001) helped to clarify the relationship of iconicity and metaphor in ASL: Both ground their approach in cognitive linguistics and Lakoff & Johnson’s ideas about experientially based metaphorical mapping; and most important, both authors demonstrate how gestural languages, through metaphorical use of iconic

signs, communicate abstract concepts, a capability that had been disputed for at least the last century.

Phillys Wilcox—in her review of the literature on metaphor in Sign Languages Wilcox’s primary purpose is to show how notions of iconicity and metaphor have been confused. At times metaphorical signs have been identified as metonymic, and at others iconic signs have been labeled metaphorical. For example, as a result of a vague use of terminology, the relation between the fingers and branching in the sign tree has been called metaphorical. The fingers were described as “symbolically representing” branching, and this symbolic representation was deemed metaphorical.

Over the past decade Wilcox, developed a model of iconicity that she called cognitive iconicity based on the theory of Cognitive Grammar that claims that lexicon and grammar are fully describable as assemblies of symbolic structures, that is, pairings of semantic and phonological structures. From the cognitive grammar perspective, grammar is not distinct from semantics. The elements of grammatical description reduce to form–meaning pairings.

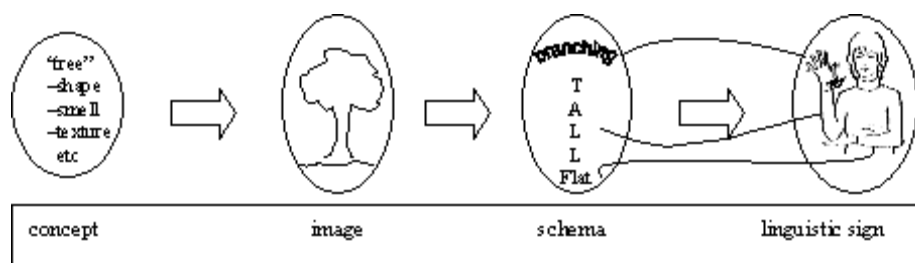
By adopting this view we can talk about similarities as distance between structures that reside in multidimensional conceptual space. Certain notions reside close to each other in conceptual space because they possess certain similarities.

Cognitive iconicity is defined not as a relation between the form of a sign and what it refers to in the real world, but as a relation between two conceptual spaces. Cognitive iconicity is a distance relation between the phonological and semantic poles of symbolic structures. In Wilcox’s opinion, “two further notions are necessary to understand how cognitive iconicity works. The first is *construal*. The mapping relation in cognitive iconicity is not between objectively defined forms and objectively determined scenes. As Langacker (1991) points out, there are many ways to construe an event, and an event’s objective properties are insufficient to predict its construal. Iconicity is not a relation between the objective properties of a situation and the objective properties of articulators. Rather, the iconic relation is between construals of real-world scenes and construals of form. Second, we must note that *metaphor* can create an iconic mapping which did not exist prior to the metaphorical mapping. Because metaphor is a mapping across semantic domains, it can reposition the semantic pole of a symbolic structure to a different region of conceptual space, bringing it closer to a particular region of phonological space. For example, if in some signed language time were conceived as a process and expressed phonologically as a handshape (an object instantiated in three dimensional space), there would be no iconic relation: processes and objects are too distant in conceptual space to motivate cognitive iconicity. If instead time is metaphorically conceived as an object moving in space and realized phonologically as a moving handshape, the sign is iconic”.

This Wilcox re-examination leads to three conclusions. First, iconicity clearly also emerges on the more grammatical elements of morphologically complex

forms. Second, analyzing iconicity requires that we examine not just our conceptualization of objects and events in the world, but also of articulations-hands and movements-that are the phonological pole of signed languages. Third, the iconic mapping of form and meaning in some cases is created by a metaphoric mapping.

Sarah Taub— describes types of iconicity in both signed and spoken modalities. She sketches a three-step analogue-building model for the creation of linguistic iconic forms: the first step is the selection of a mental image that is associated with the original concept. The mental image is then schematized—essential features are picked out and unnecessary ones dropped. Finally, the schema is encoded, using the appropriate and available resources of the language.



Naturally, a visual modality will be able to encode iconically many more visual and kinesthetic images than an oral modality will sound images. Turning the tables on the traditional view of iconicity in language, Taub, along with quite a few others by now, suggests that “*languages are as iconic as possible, given the constraints of their modality*”.

In other words, as Lind said, when it comes to the reasons that a Sign Language produces so many iconic forms, the first simple answer is, “because it can!” (Fischer, 2002). Another reason mentioned by Fischer & Müller is that Sign Languages may not grammaticalize as rapidly as spoken languages, most signers do not have signing parents, so the language must be recreated in every generation. Thus, it may be that the persistent iconicity of sign languages is due in part to sociolinguistic factors, counteracting the kind of tendencies noted by Frishberg.

The particular instance of structure-preserving mapping of meaning onto form shown in the model above is a shape-for-shape encoding. The shape of the branching leafy part of the tree schema corresponds to the shape of the hand and fingers, the shape of the trunk to the vertical forearm, and the ground to the horizontal forearm. Taub mentioned that Signed Languages can encode schemata iconically in a variety of ways and she identifies nine types of such encoding in American Sign Language:

1. Physical entities can represent themselves
2. The shape of the articulators represents the shape of the referent (example: *TREE*).
3. The movement of the articulators represents the movement of the referent, or path-for-path iconicity (signing the person classifier and moving it upward in a zigzag path represents the movement of a person going up a winding path)
4. The shape of the articulators' path represents the shape of the referent, or path-for-shape (in Romanian sign Language the shape of the tree is outlined for the sign *TREE*).
5. Locations in signing space represent locations in mental space, or space-for-space. Although there is much discussion about the uses of signing space—for example, the problem of distinguishing between gesture and linguistic sign—there are clear examples, such as the description of a room, where the use of signing space maps spatial relationships in the mental image.
6. The size of articulation represents the size of the referent, whether relative or absolute.
7. The number of articulators represents the number of referents—number-for-number
8. The temporal ordering of signing represents temporal ordering of events. This is a type of iconicity that is shared with spoken languages. In narrative, for example, events are typically recounted in the order that they occurred.
9. Signing represents signing, or “quoted signing.” This might occasion a series of mappings as the signer shifts roles from one person in a reported dialogue to another, assuming the relative spatial locations of each, creating a different mapping of the imagined space onto the signing space.

With this inventory for creating iconic linguistic items and the notion of mapping to build analogues of concepts, Taub has a basis for modelling the creation of metaphor in ASL. Her focus is on conceptual metaphors, which, as described by Lakoff & Johnson, involve a schematic mapping from a source experientially-based domain to a target abstract conceptual domain. She combines the model for mapping iconic items and the cognitive model for mapping metaphors to produce what she describes as a “double-mapping.” There is the metaphorical mapping from a concrete to an abstract domain, and the iconic mapping from the concrete source domain to its linguistic form.

Taub's treatment of mapping stands out for its attention to the identification of all its elements. She provides tables of mappings for all the metaphors discussed in detail, and describes a well-constructed table of a mapping as follows:

“The essential elements of a mapping include a list of entities (people, things, concepts), relationships, and actions or scenarios from the source domain; a similar list from the target domain; a statement of how the elements in each list correspond to each other; and ... metaphorical expressions that exemplify (and thus justify) each correspondence.”

Conclusion

This article provided information about Sign Language particularities but I hope it encouraged future researches about Romanian Sign Language, because at the moment there are not systemic works focused on it. I am sure that through highlighting important issues and references to other works, readers' appetite for further reading in this interesting area will increase. For educational and professional reasons and for its own intrinsic value, linguistic study of sign languages clearly merits further study.

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**DO GENERAL KNOWLEDGE, FREQUENCY OF CONTACT,
AND INTENSITY OF CONTACT INFLUENCE THE
UNIVERSITY STUDENTS ATTITUDES' TOWARD PERSONS
WITH INTELLECTUAL DISABILITIES?**

LAURA E. RUNCEANU

ABSTRACT. Dieses Studium vertretet die Haltungen einer Studentengruppe (N = 205) der Fakultät für Psychologie und Ausbildungswissenschaften der "Babeș-Bolyai" Universität aus Cluj Napoca, gegenüber den Personen mit geistiger Behinderung. In Hinblick der Einschätzungen der Haltungen, haben wir *Die Inventur der Haltungen gegenüber der geistigen Behinderung – überprüfte Form* (Antonak und Harth, 1994) verwendet. Wir haben festgestellt, dass die Haltungen der Studenten gegenüber den Personen mit geistiger Behinderung im allgemein positiv sind, das als Folge der qualitativen und quantitativen Überprüfung der Angaben. Diese Haltungen sind von der allgemeinen Ebene der Kenntnisse betreffend die Eigenschaften und Lebensbedingungen der Personen mit geistiger Behinderung, ungeachtet der Häufigkeitsbeziehungen zu diesen Personen, beeinflusst.

Developing an understanding of the attitudes that predominate in a specific community is critical if we are to promote the acceptance and inclusion of persons with intellectual disabilities into the mainstream of society, and to bring about social change.

Attitudes are latent or referred psychological processes that are present in all people and are given expression or form when evoked by specific referents (Antonak & Livneh, 2000). They are acquired through experience over time and are socially constructed (Tregaskis, 2000).

The literature is replete with studies in which researchers have examined attitudes toward persons with disabilities. However, a review of the literature is complicated by the fact that some authors investigate attitudes toward persons with disability in general, whereas others investigate attitudes toward persons with a specific disability.

Theories and research results on the structure of attitudes toward persons with intellectual disabilities demonstrate the multidimensional character and the influences of multiple factors on their elaboration.

Research results suggest that there are different factors influencing the process of elaboration and structuring of attitudes toward persons with intellectual

disabilities. Most research has been focused on factors like age, gender, socioeconomic status, educational level, personal experiences or direct contact with persons with intellectual disabilities, profession, etc. These studies have mostly investigated the attitudes of college students and different professionals working with persons with intellectual disabilities.

Myers, Ager, Kerr, & Myles (1998) have identified three categories of factors that influence how people without disabilities interact with and include or exclude persons with intellectual disabilities: 1. a preparedness to engage with people as consumers, neighbors, or friends), 2. a lack of awareness about these persons and 3. a wariness or even hostility regarding the idea of community integration.

Kobe & Minnick (1995), cited by Yazbeck, McVilly, & Parmenter (2004), conclude that the attitudes toward persons with intellectual disabilities are influenced by the educational level of the participants. Tak-fai Lau & Cheung (1999) confirm the influence of this factor; the authors conclude that persons with a higher educational level are more willing to interact with and to talk to persons with intellectual disabilities, and they hold lesser negative attitudes. According to the results collected by Yazbeck et al. (2004), the participants at the higher educational level (University) displayed the most favorable attitudes toward persons with intellectual disabilities. Some authors suggest that access to education and information about the disability might influence the cognitive schemes and consequently the attitudes of an individual (MacDonald & MacIntyre, 1999). However, as far as it concerns the University students the attitudes are related to the type of studies. Students in social work or psychology hold more positive attitudes when compared to students in economics, engineering or physics (Loo, 2000; Hunt & Hunt, 2000).

Researchers have noted that the best predictor of attitude towards persons with intellectual disabilities is a respondent's prior knowledge of or/and contact with a person with such disability (Antonak et al., 1993).

Research results on the influences of experiences or direct contact with persons with intellectual disabilities are contradictory. Some recent data suggest an increase of positive attitudes, and less discrimination when there has been interaction with persons with intellectual disabilities over six months; however, the relation between the effects of the interpersonal contacts and the attitudes is not conclusive (Yazbeck, McVilly, & Parmenter, 2004; Tak-fai Lau & Cheung, 1999).

Rimmerman, Hozmi, & Duvdevany (2000) have investigated the effects of previous or present contacts on students who have been involved in tutorial activities with students with developmental delays. The authors conclude that there is a relation between direct contact and attitudes, which depends on the period of time spent together. Smith (2003) results based on in-depth interviews with students participating in different projects with pupils with disabilities, emphasize how the students' ideas about disability-related issues have changed as a consequence of direct contact. Attitudes may become positive during the interactions with persons with intellectual disabilities through direct observation of positive characteristics,

correct information, and a change of misconceptions about these persons (Tak-fai Lau & Cheung, 1999).

Other authors conclude that there are no significant differences in attitudes or these differences are minimal as a consequence of direct contact (Siperstein et al., 2007).

Moreover, some research results suggest that direct contact determines negative attitudes or reinforces them (Gottlieb & Budoff, 1973), or there is no significant change (Hagen, Powell, & Adams, 1983).

These contradictory results may have different explanations, such as the type and the quality of contact between persons with and without intellectual disabilities (Yazbeck, McVilly, & Parmenter, 2004). Most research has been focused on attitudes of children or college students (Krajewski & Flaherty, 2000; Hastings, Sjöström, & Stevenage, 1998), the sample has not been always adequately randomized and the relationship attitudes-behaviors has not been questioned.

In the present study we aimed at examining the attitudes of University students (psychology, education and special education) toward persons with intellectual disabilities. Increased knowledge about their attitudes could have important implications for the initial training and their future professional life. Our purpose in this study was to add to the existing knowledge base regarding University students' attitudes toward persons with intellectual disabilities, and more specific to analyze the nature of these attitudes in relation to three factors that influence them.

Research hypothesis

The current study investigates the following hypothesis:

1. There are significant differences between students' attitudes depending on their general knowledge of characteristics and living conditions of persons with intellectual disabilities.
2. There are significant differences between students' attitudes depending on the frequency of their contacts with persons with intellectual disabilities.
3. There are significant differences between students' attitudes depending on intensity of contacts with persons with intellectual disabilities, irrespective of frequency.

Participants

In the current study, all participants were volunteers. The Mental Retardation Attitude Inventory – Revised (Antonak & Harth, 1994) was administered to 205 students of the Faculty of Psychology and Sciences of Education, Babeş-Bolyai University, Cluj Napoca.

The characteristics of the participants are detailed in Table 1.

Table 1.

Characteristics of the sample

INDEPENDENT VARIABLE	N	% OF SAMPLE	MEAN	SD
Gender				
Female	197	96.1		
Male	8	3.9		
Age *	204		20.90	2.85
Department				
Psychology	74	36.1		
Special Education	101	49.3		
Education	30	14.6		
Type of relations with persons with ID**				
None	57	22.8		
Sister/brother	1	0.4		
Relative	25	10.0		
Colleague	3	1.2		
Friend	2	0.8		
Neighbor	50	20.0		
Acquaintance	30	12.0		
Pupil	36	14.4		
Other	46	18.4		

Note. * There were 205 questionnaires returned, although not all respondents provided complete profiles.

** Each participant has chosen 1 or more type of contacts.

Procedure

Instructors of various courses, selected at random from the Faculty timetable, were contacted and the study was described to them. Permission was obtained from the instructors to recruit participants from their class who want to participate voluntarily in the study.

We distributed 205 questionnaires, which included a personal information form (general information about age, gender, department, study year). Replies were individual and anonymous. Respondents were also asked to indicate if they knew a person with intellectual disability and, where appropriate, to describe the relationship. These responses were organized into five ordered categories (Antonak & Harth, 1994): 1. intimate (e.g. immediate family member, spouse, child, sibling); 2. close (e.g. relative, room-mate); 3. casual (e.g. client, co-worker); 4. acquaintance (e.g.

neighbour); 5. none. Three questions asked the respondents to indicate on 6-points scales the general knowledge of the characteristics and life circumstances of persons with intellectual disabilities, the frequency of their contact with persons with intellectual disabilities, and the intensity of their contact, irrespective of frequency.

Instrument

The *Mental Retardation Attitude Inventory – Revised* (Antonak & Harth, 1994) or *MRAI-R* was selected as the main instrument based on its established reliability, validity and multidimensionality.

The instrument contains 29 items, grouped in 4 scales: Integration-Segregation scale (INSE), Social Distance scale (SDIS), Private Rights scale (PRRT), and Subtle Derogatory Beliefs scale (SUDB). The Integration-Segregation scale items measure attitudes relative to inclusion of persons with intellectual disabilities into preschools, general education schools, and the work place. The items in the Social Distance scale were designed to determine attitudes toward living or being in close proximity with persons who have intellectual disabilities. The items in the Private Rights scale determine the respondents' attitudes on the enforcement of the civil rights of persons with intellectual disabilities. Items on the Subtle Derogatory Beliefs scale measure to what degree the respondents attribute unfavorable characteristics to persons with intellectual disabilities.

The MRAI-R contains both positive and negative items to limit the influence of affirmative response bias. The response scale for all items is a 4-point Likert scale on which respondents indicate whether they strongly disagree, disagree, agree or strongly agree.

Reliability

The reliability was computed using Cronbach's coefficient α and Guttman's coefficient (split-half). The alpha coefficient for the MRAI-R was .84 and the split-half coefficient was .83.

Variables and statistical analysis

The data were analyzed using SPSS for Windows (Version 10). The means and standard deviations (SDs) for the 29 items were analyzed, and one-way analysis of variance (ANOVA) was employed to assess the impact of the independent variables (general knowledge of characteristics and living conditions of persons with intellectual disabilities, frequency of contact and intensity of contact) on the dependent variables. The dependent variables were students' attitudes toward persons with intellectual disabilities in each of the four scales of MRAI-R. We have tested the normality of distribution and homogeneity of variance (Levene statistic). Also, because not all respondents provided complete profiles, sample sizes for the different analyses varied.

Results

Table 2 shows the means and SDs of score on scales of MRAI-R and the inventory. The scores are high for the Integration-Segregation scale ($M = 20.53$, $SD = 3.35$), Social Distance scale ($M = 27.10$, $SD = 3.51$), Private Rights scale ($M = 21.20$, $SD = 2.71$), Subtle Derogatory Beliefs scale ($M = 19.51$, $SD = 2.41$), and for the all inventory ($M = 88.39$, $SD = 9.26$) expressing positive attitudes toward persons with intellectual disability.

Tabel 2.

Means and SDs of scores on scales of MRAI-R and MRAI-R

SCALE	N	MEAN	SD	SKEWNESS	KURTOSIS
INSE	205	20.53	3.35	-.097	.492
SDIS	205	27.10	3.51	-.462	-.048
PRRT	205	21.20	2.71	-.117	.060
SUDB	205	19.51	2.41	.293	.080
MRAI-R	205	88.39	9.26	-.110	-.062

Using a mean of 2.5, the means and SDs for the 29 items were analyzed.

Integration-Segregation Scale. The lowest scores (expressing less positive attitudes) were obtained for the following items: item 13 ($M = 1.84$, $SD = .72$), item 23 ($M = 2.05$, $SD = .68$), and item 1 ($M = 2.27$, $SD = .83$). These items concerned placing children with intellectual disabilities in preschool classes and general education classes. The highest scores were obtained for the items 17 ($M = 3.13$, $SD = .71$), and item 2 ($M = 3.11$, $SD = .69$). These responses express positive attitudes toward the inclusion of persons with intellectual disabilities at the workplace and into the same neighborhoods.

Social Distance scale. Respondents' attitudes are less positive for the items 18 ($M = 1.42$, $SD = .60$), item 27 ($M = 1.46$, $SD = .68$), and item 15 ($M = 1.79$, $SD = .77$). These items refer to being in the proximity of a person with intellectual disability in different locations or social contexts, such as a swimming pool, an apartment building, and as a guest for a dinner. With the exception of these items, students agreed to strongly agreed with the other items, and the scores are high for the item 24 ($M = 3.18$, $SD = .71$), item 5 ($M = 3.33$, $SD = .61$), item 19 ($M = 3.35$, $SD = .73$), item 11 ($M = 3.38$, $SD = .67$), and item 3 ($M = 3.62$, $SD = .59$). These items concerned different social contexts, and the use of services offered by persons with intellectual disabilities, such as going to a competent barber or hairdresser, introducing such a person to his/her friends, attending to cultural events in the company of a person with intellectual disability, allowing to his/her child to attend to a party organized for a child with intellectual disability.

Private Rights scale. Respondents' scores are low at the items 20 ($M = 1.68$, $SD = .78$), item 6 ($M = 1.88$, $SD = .78$), and item 12 ($M = 2.07$, $SD = .82$).

These items refer to the owners' right to refuse to offer different types of services to persons with intellectual disabilities (e.g. campground and amusement park owners, landlords, employers). The scores are high for the items 28 ($M = 2.57$, $SD = .77$), item 14 ($M = 2.82$, $SD = .84$), item 8 ($M = 3.02$, $SD = .74$), and item 22 ($M = 3.42$, $SD = .77$). The items refer to the rights of persons with intellectual disabilities to benefit from the services offered by a day care center or nursery, and real estate agencies.

Subtle Derogatory Beliefs scale. The lowest scores are obtained for the items 16 ($M = 1.63$, $SD = .61$), item 9 ($M = 1.99$, $SD = .73$), item 10 ($M = 2.10$, $SD = .74$), item 4 ($M = 2.14$, $SD = .72$), and item 26 ($M = 2.17$, $SD = .67$). These items concerned the inclusion of pupils with intellectual disabilities into mainstream schools (e.g. respondents believe that these pupils waste time playing in class, do not gain from being tough in a mainstream school). Some items express less positive attitudes toward the competencies of persons with intellectual disabilities to establish and maintain social relations. Respondents' scores are high for the items 21 ($M = 2.46$, $SD = .78$), and item 25 ($M = 2.75$, $SD = .67$). These items concerned the problem of prejudice toward persons with intellectual disabilities and the equality of participation in social situation.

The effects of the independent variables on the four MRAI-R scale were explored using one-way ANOVA.

The ANOVA revealed a main effect for the general knowledge of characteristics and living conditions of persons with intellectual disabilities with regard to attitudes toward Integration-Segregation, $F(5, 199) = 6,281$, $p < .01$, and Private Rights, $F(5, 199) = 3,199$, $p < .01$. The general knowledge effect did not emerge for Social Distance and Subtle Derogatory Beliefs. Consequently, the first research hypothesis is partially confirmed.

As far as it concerns the frequency of contact with persons who have intellectual disabilities, the ANOVA revealed a main effect with regard to attitudes toward Integration-Segregation, $F(5, 199) = 2,859$, $p < .05$. The frequency of contact effect did not emerge for Social Distance, Private Rights, and Subtle Derogatory Beliefs. Consequently, the second research hypothesis is partially confirmed.

The ANOVA revealed a main effect for the intensity of contact with persons with intellectual disabilities, irrespective of frequency of contact with regard to attitudes toward Social Distance, $F(5, 199) = 3,995$, $p < .01$. The intensity of contact effect did not emerge for Integration-Segregation, Private Rights, and Subtle Derogatory Beliefs. Consequently, the third research hypothesis is partially confirmed.

Discussion

In this study, we identified the University students' attitudes toward persons with intellectual disabilities, and have investigated three factors that were associated with or expected to influence their attitudes.

Data analysis of the inventory responses indicated that students strongly agree to the inclusion of persons with intellectual disabilities at the workplace and into the same neighborhoods. They would allow their child to accept an invitation to a birthday party for a child who has intellectual disability. This result is consistent with results of study conducted by Krajewski & Flaherty (2000). The respondents also indicated that they would be willing to go to either a competent barber or hairdresser who has intellectual disability. They would also introduce a person with an intellectual disability to friends and neighbors in his/her hometown, and attend the movies or a play in the company of a person with intellectual disability.

They disagreed, however, with the inclusion of children with intellectual disabilities into school, high-school, swimming in the same pool, and living in the same apartment building with persons who have intellectual disabilities. The respondents considered that the inclusion process is not beneficial for the pupils with intellectual disabilities; generally, these persons cannot adequately participate in social interactions because they are not ready to practice the self-control that is necessary in social contexts, and did not learn to accept limits in their relations with the opposite gender. The students indicated that they agree that campground and amusement park owners have the right to refuse anyone, including persons with intellectual disabilities.

To explain these students' responses, it is important to examine the nature of their prior experiences with persons with intellectual disabilities. Although it was not within our scope in this study to analyze the effects of students' experiences that occurred prior to participating in the study (see Table 1), it is highly likely that such experiences had an impact on the attitudes measured in this study. The respondent noted that they have a neighbor with an intellectual disability (50), know a pupil (36), an acquaintance (30), have a relative (25), a colleague (3), a friend (2), or a sister/brother (1).

The general knowledge of characteristics and living conditions of persons with intellectual disabilities influences the attitudes toward the integration or segregation of these persons into the community life, and the promotion of their rights. The respondents' attitudes toward the integration or segregation into the community life are also influenced by the frequency of contact with persons with intellectual disabilities. The intensity of contacts with persons with intellectual disabilities influences the attitudes toward living or being in close proximity with these persons. These findings are generally consistent with the results of other studies. For example, misconceptions about persons with intellectual disability have been reported to be generally lower in persons who have had contact with a person with intellectual disability (Antonak et al., 1989).

The current study demonstrated that University students' attitudes are generally positive and influenced by their general knowledge, frequency of contact, and intensity of contact with persons with intellectual disabilities.

Caution should be exercised when interpreting and generalizing these findings, however. The participants were enrolled in courses of psychology, education or special education. Further research should focus on the study of attitudes of respondents studying in other fields related to disability-issues (e.g. social work, law etc.). Further research could also address differing attitudes toward persons with intellectual disabilities who have varying support needs (intermittent, limited, extensive, and pervasive; cf. AAMR, 2002).

The accurate monitoring of changing University students' attitudes (e.g. over time, in response to participating in courses and interacting more frequently, and at higher levels of intensity with persons with intellectual disabilities) remains problematic however. For this reason, the instrument used in this study could be applied to a larger scale, longitudinal investigation. In addition to conducting further researches with the current instrument, it is evident that to develop a more in-depth understanding of students' attitudes, how they are influenced, by which factors and how they change over time, research using qualitative techniques is also necessary.

Based on the findings of the current study, we believe that in addition to an emphasis on gaining knowledge, University students need to establish more direct contacts with persons with intellectual disabilities, in different social contexts.

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BIOETHICAL APPROACH IN VASCULAR SURGERY

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ABSTRACT. Ethical approach is essential in the relationship between physician and patient. The principles of ethics must be observed in patient study, treatment or in clinical trials. Medical ethics suffered changes and a permanent evolution from the classical Hippocratic Oath to nowadays, along with evolution of society on the whole. The present paper will discuss, based on 6 study cases, the main bioethical rules in vascular surgery, debating upon patient-surgeon relationship, patient's autonomy in therapeutical decision and self-determination, the principles of benefit and „non nocere”, the impact of health resource allocation and professionalism of health care.

KEY WORDS: bioethics, vascular surgery, counseling

Introduction

When graduate university all medical students are sworn in Hippocratic Oath and consent to respect the fundamental principles of life. These principles recommend: (1) make well; (2) respect the dignity of the subjects involved in the experiment; (3) not make harm; (4) principle of justice- properly allocation of resources, benefits and risks. Also, in medical practice, medical research or medical teaching, the bioethical principles must be respected.

Even if many surgeons consider themselves honorable, correct, reliable and preoccupied with ethical aspects, they can confront situations which could determine a violation of patient's dignity and rights, risking to consider him a simple instrument to fulfill personal goals, a teaching material or alarmingly, a curiosity (Berle, 2008). Also, the physicians may encounter ethical problems raised from the patient psychological or social particularities.

Healthcare bioethics is exploration of moral decisions or options available to resolve the dilemmas in treatment of patients. This is a term for many components of medical ethics, research and organization ethics. Their complexity offers many challenges like ethical issues related to surgery.

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Beginning in 1947, and over the next sixty years, the field of bioethics took shape and earned an established place in academic medicine, practical medicine, research involving human subjects, and public policy. The field of bioethics includes the medical science, the disciplines of theology and philosophy and the study of law and social sciences. The medical discoveries significantly increased the physician's ability to successfully manage the diseases of their patients. The vaccines, the chemotherapy, the anti-hypertensive medication, the hemodialysis, the cardiopulmonary resuscitation and intensive care units with ventilators ushered new challenges in medical ethics. Sustaining life became more complex; the technology gave to the medical practice new frontiers in healing, and at the same time, the capability to prolong life before dying. Each new technology raised difficult choices and life circumstances. Therefore, the patients, the families, the physicians and other health care providers need assistance from experts in bioethics. Tom Beachamp and James Childress (2001) in their work „Principles of Biomedical Ethics” show Bioethical guidelines to respect the autonomy, nonmaleficence, beneficence, and justice (Sentara Center Healthcare Ethics).

The healthcare ethics in surgery as well as diagnosis and treatment are essential in patient's care. Most situations which challenged ethical matters are in fact conflicts between moral obligations and personal or scientific interests, family's or other people's importance. The research ethics protects the rights of individuals who agree to participate in research studies. The process includes informed consent, disclosure, confidentiality of medical information, and the patient's belief that he will not be harmed by the research.

The field of health care ethics continues to evolve as the new technologies and the research determine us to make the morally and ethically acceptable decisions. On the other hand the patient-surgeon relationship and the professionalism have other meanings than in other specialties.

Patient-surgeon relationship

In the absence of pre-established relation, the particular patient-surgeon relationship has at its basis a mutual agreement concerning patient's necessary attendance (Anonymous, 1998).

In the context of patient-surgeon relationship the most important fact is the communication and shared decision making. The surgical consent will be obtained in the context of patient-centered medicine.

The patient has the right to be correctly informed about the benefits and risks of the surgical intervention, to be treated by a competent surgeon, to be sure that his health condition is safe and beyond surgeon's interests - economical, technical or scientific (McCullough et al., 1998, p. 416).

The surgeon has the duty to protect, defend and assure patient's trust that these interests will be respected.

The patient has the right to know that he will not be submitted to any harm, by negligence or deliberately, and that he will not be disappointed or even killed by the surgeon.

The patient has right to know that if he does not follow the surgeon's recommendations, his illness will get worse and possibly his life will be in danger. He will be informed about the evolution of his illness and possible complications.

The informed consent is operationalized in surgical practice through the doctrine of shared decision making. The physician and the patient compose a decision-making partnership. The physician contributes with information about diagnosis, prognosis and treatment options, with risks and benefits, and frequently provides medical opinion and treatment recommendation. Together, the physician and the patient agree on the course of the treatment that is then carried out. The good patient-surgeon communication fosters a good consent. The patient tries to understand which the best surgical treatment is and how it will affect his life in short and long term. The surgeon needs to understand the patient's preferences, expectations and fears.

The communication between physician and patient in surgical situations is mediated by psychological and social aspects such as coping styles, anxiety, cognitive inferences and evaluations, patient's socio-economic status, etc. To take just an example from those factors, we will present how *coping style* may influence the physician-patient relation. The concept of *coping* is very similar to that of adaptation (Allison, Locker and Fine, 1997). However, coping emphasizes stressors and the individual's attempts to deal with them. Lazarus and Folkman (1984) have defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person". They propose two fundamental types of coping based to its function: *problem-focused coping* addresses directed at managing the problem causing the distress, and *emotion-focused coping* addresses directed at regulating the emotional response to the problem. The former coping strategies are more likely to be mobilized if a stress is appraised as manageable and amenable to change. These include information- seeking, aid-seeking and direct action. On the other hand, emotion-focused coping strategies will tend to be used when a stressor is appraised as being beyond control. These strategies include trying to see humor in the situation, avoidance behavior and detachment (Folkman and Lazarus, 1980). Based on those types of coping style, a good physician-patient communication is attained when the physician formulate his message on terms of the patient's coping styles. More precisely, for the patients using the problem-focused coping, the physician is recommended to use a lot of information, technical explanations, details of the surgery and its effects because those patients are eager about the information. On the other hand, for the patients using emotion-focused coping, the physician must communicate his message on emotional terms and he may skip technical details; those patients are sensitive on the emotional part of the intervention.

Patient's autonomy

A conscious patient has the right to make a decision in rapport with surgeon's indications not only in chronically situations but also in vascular emergencies.

The surgical consent is not an event or a signature on a form but is an ongoing process of communication that continues throughout preoperative, perioperative and postoperative care. This consent is best conceptualized as shared decision making with patients or their surrogates. The American College of Surgeons and the Society for Critical Care Medicine published consent guidelines with many elements generally understood, but several issues remained controversial (Bernat and Peterson, 2006).

The fact that every adult human being of sound mind has the right to determine what shall be done with his own body is basically the principle of self-determination. In this context, the patient's estimated life expectancy is another fact that the surgeon needs to communicate for a valid surgical consent in the critical situations. Inadequate informed consent must be considered a tort of negligence. Beyond the law, informed consent is the base of ethical medical and surgical practice, because it enshrines the respect for the patients. Considering that the patients are autonomous and endowed with dignity and basic human right of self-determination, the informed consent must respect the patients' rights. The patients will make decisions for themselves according to their own concept of what means the good life, being free to act on their decision (Bernat and Peterson, 2006).

Case report I.

White female patient, 75 years old, without relevant events in her medical past, independent, lives with her sun's family. She is brought in vascular emergency service for an acute ischemia of the right inferior limb by arterial embolism for approximately 6 hours. After the clinical examination, the surgeon on duty recommends an embolectomy and before explaining the benefits and risks of surgery, he was approached by patient's sun who asked him not to discuss about amputation as a therapeutically possibility because his mother is extremely sensitive.

Discussion

In this case the sun's intervention determines a violation of patient's rights to be correctly informed. The surgeon must prefer the complete patient's information, leaving him or the possibility to accept it or not. The information censorship at family's request, broking patient's rights and dignity, contradicts the professionalism.

Most patients want to know the nature of their disease and the reason for the surgical intervention (Dawes and Davison, 1994).

The adequate explanation requires clear information on diagnosis, surgical and non-surgical therapeutic alternatives, benefits and risks of each alternative. Also the surgeon must explain to the patient the uncertainties of some situations where he couldn't guarantee for sure (McCullough et al., 1998).

The information censorship during the consent's obtaining process, regarding the disclosures, can cause damage or pain to patient, and it is called "therapeutical privilege" (Meisel , Roth and Lidz, 1977)

In some cultures making a decision focused on the family is privileged in rapport with the model focused on individual, as it is happening in occidental countries. In *case I* the sun's intervention is not similar to the family's decision.

Case report II.

White 63 year's old male patient without any other clinical diseases underwent aorto-bifemoral prosthesis for Leriche Syndrome 5 days ago. The postoperative evolution was difficult being complicated by renal transitive insufficiency, prolonged paralytic ileus, fever, nervous disturbances (periods of excitement alternating with confusion). The paraclinical explorations reveal a generalized peritonitis by sigmoid perforation (sigmoid colon infarct). The surgeon suggests an immediate surgical intervention to solve the complication, but the patient refuses it because of his incapacity to struggle for life. After a detailed discussion of his medical situation with all possibility of treatment, the patient agrees with the surgical solution after a short period of time.

Discussion

It is a general principle of law and medical practice that people have a right to consent to or refuse treatment. Juridical speaking, our patient could be considered to possess the capacity of decision, but practically his capability to understand his situation was altered. The patient must prove the capacity to understand the medical information in order to be able to make a decision accepting also its consequences. In some situations the surgeon cannot be sure of the patient's capacity to understand and decide adequately.

The adequate treatment's refusal can persuade sometimes the surgeon to consider the patient being incapable of decision, when in fact most of refusals are motivated by other factors. All the citizens have a constitutional right to refuse unwanted therapy. This right pertains to all therapies, including life-sustaining therapies, surgery or artificial nutrition, without which the patients would die. In case of a patient's refusal of therapy, surgeon may strongly urge the acceptance of recommended therapy by explaining the reasons to the patient (he/she would be healthier with the recommended treatment) and emphasizing the risks of not doing so. The patient can present pertinent reasons to refuse the surgery, but the surgeon, performing a professional and moral dialogue, completed with family support and supplementary information, can determine him to reconsider the intervention. For paternalism to be ethically justified in this setting, the patient's decision to refuse surgery must be proved to be seriously irrational. Patients' decisions for treatment may change over time as a result of the changes in the patient's condition, and the patients may change their minds.

When a patient is refusing the treatment proposed by a physician – and he is not motivating his refusal based on religion or other moral values - we should ask if the patient is capable of taking decisions. According to Tunzi (2001) four clinical scenarios are described that should alert physicians to assess a patient's decision-making capacity more carefully than usual. The first occurs when patients have an abrupt change in mental status. This change may be caused by hypoxia, infection, medication, metabolic disturbances, an acute neurological or psychiatric process, or other medical problem. The second occurs when patients refuse recommended treatment, especially when they are not willing to discuss the refusal, when the reasons for the refusal are not clear or when the refusal is based on misinformation or irrational biases. The third occurs when patients consent to particularly risky or invasive treatment too hastily and without careful consideration of the risks and benefits. The last scenario occurs when patients have a known risk factor for impaired decision-making, such as a chronic neurological or psychiatric condition, a significant cultural or language barrier, an education level concern, an acknowledged fear or discomfort with institutional health care settings or who are at an age at either end of the adult spectrum (children younger than 18 years or adults older than 85 years) (Tunzi, 2001). In any of this situation a psychologist can evaluate more carefully the patient mental status and try to understand his refusal of treatment.

On the other hand when, based on a professional evaluation, a patient is capable of taking decisions, and he still refuses a treatment despite of his own health or even threatening his life, we suggest that a psychologist may counseling him and see how rational are the patient's decision and assess if other psychological factors such as anxiety, distress, patient's cognitions is influencing his choice. In this case a psychological intervention may help patient to decide for his best interest.

Case report III.

White male patient 62 years old, suffering from diabetes, is hospitalized for in-nourishment diseases in the diabetes service, presenting a digital moist gangrene and a plantar abscess. The diabetes physician considers that the surgery is necessary and transmits his conclusion to the surgeon through a young teaching physician. The surgeon is working in the operating room when receives this information and meets the patient after finishing the surgery. Patient is submitted to clinical examination and the surgeon decides to inform him about the required surgery that will be accomplished.

Discussion

Three conditions must be fulfilled for valid consent:

1. The patient must be able to make a health care decision.
2. The patient must be adequately informed in order to prevent him from being surprised by a subsequent outcome.
3. The patient must consent freely, without misinformation or exaggeration.

In our case the surgeon met the patient only in the operating room and the informed consent was accomplished. The patient has the right to reach freely a decision, without any manipulation or compulsion (*free judge*). Patient's decision is influenced by internal and external factors (Singer, 1999). The internal factors are connected to patient's medical condition, and external factors to surgeon, medical team (operating team), family and friends. The surgeon must reduce the effect of internal factors without endangering the patient's capacity of decision and take the necessary precautions to minimize the risks of manipulation. The patient could be influenced by the incomplete or doubtful information, the explanation of his condition immediately before the surgical intervention or in a space that requires the imminence of a major surgical intervention. That was the situation in our case.

Specifications

The patients can use previous directives (legalized papers, religious believe) which in some situations can guide medical decisions (incapacity of decision, incapacity to express his will). Their aims are: the respect for autonomy, the minimization of the risk of an insufficient treatment, the reduction of the risk of a conflict between the operating team and the family, the minimization of the responsibility of family's and fiends' decision. Most persons which resort to previous directives do not have a serious illness, but using those texts they aim to limit a treatment that could prolong a lethal process. The surgeon has the duty and the responsibility to decide if the previous directives conditions can be applied.

The respect for the patient's autonomy must be considered also regarding his religious believes. In these situations, the surgeon must assure the patient and explain him that the medical data are confidential. According to North-American Juridical System, if the patient still refuses the treatment after all, the surgeon cannot compel him to accept it; exception from this rule can be a pregnant woman or a parent of minor child (McCullough et al., 1998). The problems appear when believes come in conflict with the patient's best interests (for instance the "Jehovah's witnesses" refuse the blood and derivates transfusion, but they accept the surgery), in those cases the physician must accept the patient option.

Case report IV.

A 58 years old man with several co-morbidities, operated for a left aorto-femoral bypass 5 years before, compromised by sepsis, which led to tight amputation, comes on emergency for massive haematuria. The explorations show a prosthesis-urethral fistula and the surgeon proposes the surgical treatment. The patient asks the surgeon not to inform his wife because she is not strong enough to hear the news. In the reception room the patient's wife is waiting for the surgeon's explanations.

Case report V.

A 60 years old man with history of limb embolism (several years ago his left superior limb was amputated after acute ischemia and recently he suffered an embolectomy on his left inferior limb) is hospitalized on emergency presenting an entero-mesenteric infarctization by superior mesenteric artery embolism. He asks the surgeon if the new surgical intervention proposed endangers his wife's life.

Discussion

Those cases demonstrate that the confidentiality can be seen as an obligation. Exception from this rule is the other persons' protection in public health situations (transmissible infectious diseases). The obligation to tell the truth is an ethical act which prevails over the respect for the patient's autonomy. The patient opens his heart to the surgeon knowing that their discussion will not be disclosed without an explicit permission.

Albert Jonsen in 1990 proposed a method of expressing a clinical ethics case into four categories corresponding roughly to the major principles in biomedical ethics (Jonsen, 1990; Jonsen et al., 1992). The four categories proposed can be expressed in the form of four questions:

1. What are the medical indications? - It illustrates the principle of beneficence and nonmaleficence from the medical point of view.
2. What is the life's quality? - It illustrates the same principle from the patient's point of view.
3. What are the patient's preferences? - It illustrates the principle of respect for the patient's autonomy.
4. Are there any context features that should be considered? - It illustrates the principle of justice.

In this context it is true that the Principles of Medical Ethics have four fundamental values, plus one:

1. Non-maleficence: disvaluing harm.
2. Beneficence: valuing the prevention of harm and doing well.
3. Autonomy: valuing the individual as one who makes self- defining choices upon which she/he acts and for which she/he is responsible.
4. Justice: valuing the "fair, equitable and appropriate treatment in light of what is due or owed to persons".
5. Trustworthiness: valuing being able to be counted on to act with integrity, to be honest and truthful and to keep his owns promises.

The technological conquest gave us the wrong impression that the disease can always be defeated. The advanced cultures have a defiant attitude about death supported by every media channel which depicts the beauty and youth. The physicians can contribute substantially to the life sense research and to the insertion of the idea of death from this point of view.

Primum non nocere deinde salutare

Case report VI.

White 75 years old man, with hemiplegia for 6 years, is hospitalized on emergency for the inferior limb's atherosclerotic trombotic acute ischemia. Being out of question other reason of critical ischemia's treatment, the vascular surgeon proposes a major amputation. After a major stroke the patient loosed his ability to decide, and recommendation was discussed with the surrogates, respective with family.

Dilemma

Who establish the opportunity of a treatment, and the usefulness of salvation of a nonfunctional limb with critical ischemia in our case? The surrogates can decide the amputation? Some therapeutic choices become useless in this case.

Discussion

The revascularization of a nonfunctional limb is nonsense. Life quality after a treatment can determine its inutility. The concept of psycho-physiological inutility is known in medical literature for some possibilities: the inutility caused by an imminent death, the inutility induced by a fatal condition or the qualitative inutility. It seem that the amputation is the best choice, but loose of the limb can influenced the psychological and social behavior. If the surgeon adopts a passive or negative attitude, he makes a mistake, a deviation from professionalism. The surgeon should maintain an attitude of hope whenever reasonable. A strong patient-surrogates-surgeon relationship, nurtured by good communication, mutual understanding, and trust, remains a powerful therapeutic instrument (Katz, 2002).

The patient's situation is critical. He is invalid to decide, because on psycho-physiological point of view he cannot represent the concept of person, as the unique and irreproducible union of body and spirit, having a free and intelligent nature (Catholic Church).The intelligence is a reliable way of knowledge of reality as it is in nature, but when the brain was damaged it will be compromised.

There are three fundamental conditions that must be applied in *surrogate* valid consent:

1. When the patient is not capable to make a healthcare decision, the surrogate substitutes his right;
2. The surrogate must receive adequate information, which requires making a medical decision, knowing choices, benefits and harm of each choice. Must be given sufficient information to prevent him from being surprised by a subsequent outcome.
3. When the patient has lost the capacity to consent, surgeon should conduct same consent discussion with surrogates who represents the patient. They should follow the patient's long ago expressed wishes and the standards of substituted judgment.

Resources allocation

The surgeon must pay attention when he reaches decisions based on life quality notion. Generally, the physicians have tendency to evaluate quality of life lower than patients do. The physician doesn't have to subordinate the medical conduct centered on patient care, regarding economical aspects.

The role of physician or a surgeon on resources distribution is limited and disputable. In general, the health organization and macro-allocations of resources are politically decided. The meso-allocations are delivered at institutional level and the micro-allocations are distributed to patients. Physicians are involved in the allocation of resources choosing explorations and interventions whose benefit is well known, choosing solutions for a better result, finding solutions based on price/benefit analysis in resources repartition (Singer, 1999; Haglund et al 2004; Adam et al., 1998).

Professionalism

The medical profession requires knowledge, self-control and responsibility. Population's trust on physicians is an essential part of this contract, depending on the integrity of each individual and professional behavior. Professionalism requires to place patient's interests above own right evaluation and maintaining the levels of integrity and competence, clear advice for society regarding health politics. The method of short time training on high technologies is not a competence; applying it in clinical practice without a good practical experience raises ethical problems in cases' management (Jones, McCullough, 2002).

Health become a consumer good and as any other product, is submitted on market laws; marketing and competition, the race for profit which has become a moral imperative of our times. Physicians aren't tempted to have a higher moral level than the society they live in. Tension, conflicts between the interests of clinicians, institutions and insurances, influence unequal but mostly negative the physician-patient relationship. Individuals, groups, organizations and institutions have an important role in medical practice and in the medical decision with its consequences.

In the world of consumption it is possible to escape the ethical and professional background and so following the repetition of cycles de-professionalization / re-professionalization specific to moral confusion times (Pellegrino, 2002) which justify some requests to settle a professional code (Brennan et. al., 2002). It is unlikely that the a new professional code will change the present situation as long as physicians won't be convinced about the priority of patient health in comparison with their own technical, scientific or academic interests.

Conclusions

All physicians, surgeons or vascular surgeons must try to respect the life, human rights and the principles of bioethics. Only this attitude will help to emphasize

some conflicts of interests between moral obligations regarding the patients and own interests, family's interests or of others.

Especially the surgeons must be moral, honest and truthful to make possible to grant the highest health standards to the largest possible number of citizens. The dispute between "quality of life", resources allocation and professional bravery must be successfully resolved in interest of patients and according to their wishes.

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COGNITIVE STYLES - THE ACTIVITY FOCUSED APPROACH

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ABSTRACT. Dieses Studium beschreibt das Konzept des „style“, die uns die Analyse und die Deutung eines „Handlungsmöglichkeit“, erlaubt. Der Stil definiert die Möglichkeit, die konkrete wirkungs und im Zeit wiederholungs Wege eines Menschens. Im Bildungs Zusammenhang koennen wir ueber einen Denkenstil, einen Lehrungsstil und einen Ausbildungsstil reden. Die Analize und die Kennzeichnung von Prozesse die sich an der gleiche Ebene mit dem menschliches Gehirn befindet, bedeuten wichtige Vorraussetzungen in der Abklaerung von Moeglichkeiten der Lehrung die als Grundstellung den Schueller haben.

Defining the concept of cognitive style

The possibilities of defining various concepts, theorems, paradigms or definitions that were based on different trends in psychology, have always raised disputes between specialists. The contradictions were based either on the essential outlook from which those psychological trends started, or the scientific-informational content based on arduous or less arduous research that would support that certain concept, paradigm, etc.

A definition of the cognitive style concept, unanimously accepted, is hard to emphasize in terms that this has known a period of success after the 50s, a period standstill in the 70s, re-examination after the 80s and now has reached a controversial stage in the scientific world. Further, we will reproduce, selectively, a part of some definitions given to the concept of cognitive style so as they were highlighted by different researchers: the cognitive style represents a way of cognitively function that is typical for organising information (Mezoff, 1986); the cognitive style designates a certain way of intercepting and processing the information, a certain way of thinking, approaching and solving the problems through using different types of cognitive strategies (Preda, 1987); the cognitive style concept refers to any steady inter-individual variability phenomenon shaped as cognitive activity (Olry-Luis, 1995). According to Preda (1987), cognitive style is a complex structure that involves, the set, the way of perceiving and thinking, the thinking strategies in solving problems. All this is influenced not only by the efficiency traits of the personality (cognitive processes, ability, intellectual skills), but also by the energetic-dynamical side (temper traits that imprints a certain tempo and rhythm of the activity) and the cognitive emotions and feelings, the flexibility or rigidity of a person etc.

A concern for the cognitive styles was presented by Jung (1923) that put forward the personality types theory, subsequently adjusted, leading to different forms of it. Further research were conducted by Witkin (1964; Witkin, Dyk, Faterson, Goodenough and Karp, 1962; Witkin and colab., 1954), Klein (Klein, Gardner, & Schlesinger, 1962; Klein & Schlesinger, 1951; Smith & Klein, 1953); Gardner, Messick, and Jackson (Gardner, 1959, 1962; Gardner, Holzman, Klein, Linton, & Spence, 1959; Gardner, Jackson, & Messick, 1960; Messick & Ross, 1962); Kagan (1958, 1965a, 1965b, 1965c) (after Sternberg, Grigorenko, 1997). We will cease to the Klein and Gardner's researches from the 50s in which the concept of cognitive style had a psycho-analytic conceptual base (Faiciuc, 2003). The researches of these two we based on different types of cognitive control, defined as a hypothetical mechanism that guides the manifestation of needs in socially acceptable ways and specific to the situation, being a long-lasting structure that occurs at the interaction between the facts that determine genetically and those connected to the life experience being a result of development (Klein, 1970; Martinsen, 1997 in Faiciuc, 2003). The conclusion of the two researchers began to be doubted by Vernon (1971), Tiedman (1989, after Martinsen, 1997) and Messick (1996). They blamed the fact that many of the cognitive types identified by Klein and Gardner haven't presented stability during many researches and are focused too much on competence. In the 50s and 60s it was considered that the cognitive style represents the relation between work and cognition- work and personality (Sternberg, Grigorenko, 1997), namely, the cognitive style represents a mediator between personality and cognition (Martinsen, 1997, apud Faiciuc, 2003).

Sternberg (1997) thinks that cognitive styles have a major impact on theories regarding education and practice. The same author believes that the reason for which the cognitive styles are so studied, is given by the implication of predicting performance, the fact that it offers a link between cognition and personality (Sternberg, 1997).

In a study of meta-analysis, Sternberg (1997) moots the theory focused on cognition, personality and activity, proposing eventually a theory of mental autonomy based on the principle which says that in each person rules all cognitive styles until a certain dimension which makes individuals differ from each other. Therefore, each style manifests different at each person depending on preference, the type of the task and the situation he is confronted with.

Synthesizing the specialized literature, there are four approaches of the cognitive style revealed:

1. **The approach based on cognition** – the reflexive-impulsive and dependent- independent styles
2. **The neuropsychological approach-** the holistic-analytic and verbal-imagistic dimension
3. **The personality centred approach-** being based on Jung's theory regarding the types of personality (1923) structured on three dimensions: attitude (introversion, extraversion), perception (intuition, sensation) and judgement (to feel, to think).

4. The activity centred approach

Next, we will refer to the activity centred approach, analysing the impact on the theories regarding education and practice and the implications that the cognitive styles have on predicting performance.

This approach tends to a more dynamic conceptualisation of the styles, as mediators of different forms of activity that may appear out of the cognition and personality aspects (Sternberg, 1997). It has two dimensions: the learning styles and the teaching styles.

The learning styles

The learning style is a peculiar manner, a personal and distinctive one, of acting and behaving in a learning context. The learning styles are seen as methods of learning adequate to the student's comfort including projects, recitation, active learning, discussion, learning games, independent study, organised training, reading and simulating (Renzulli and Smith, 1978). According to Keefe (1987, quote by Preda, 2006), the learning style is a „ensemble of peculiar cognitive, emotional and physiological factors that operate with the title of indicators relatively steady of the way in which the one who learns perceives the learning environment, interacts with it and responds to it". The learning style refers to an individual psychological structure, structure that corresponds to a predisposition that would be evident in the cognitive behaviour of the one learning (Das, 1988, quote by Preda, 2006). This characteristic makes that each individual to structure learning style consonant with his set of values and expectations, adjusted to his demands and level. The preference for a certain style of learning and processing the information allows some individuals to be oriented to a visual learning style (prefers schemes, images, environmental arrangement), auditory (hearing speech, associating concepts with different sounds, music), verbal (discussions for clarifying the concepts), physical (keeping in mind certain gestures and information remembered through tactile- kinaesthetic perception), logical (using the logic reasoning, discussions and framing the concepts in systems), social (the group learning system or learning with some friends), lonesome (individual study and work).

The learning styles are discussed according to the cognitive styles. Between the two collocations there are multiple similarities, however, the synonymy is partial. Dumitru (2000) highlights the idea that learning styles have a wider sphere including, besides cognitive functioning (the sphere typical for learning styles), the emotional and psycho-motor elements along with different characteristics of the training and the set of specifications that come along with the actual learning.

The learning style of each person represents actual paths used in learning, the particular ways used especially in taking over and processing the information, in using it in real life situations. The learning styles are based on individual elements related with each one's personality that form themselves in structures through which can be noticed the inter-individual difference. Knowing the learning styles is

a necessary premise in improving education, in approaching students differently as „different styles generate different assumption actions, suggests different learning procedures” (Cerghit, 2002, p. 209). Besides knowing the learning methods by the teacher, the students must be helped to be aware of their own learning style and show interest so as to get support in outlining his cognitive style.

Bernat (2003) inventories possible classifications of the learning styles starting from different criteria:

- the Kolb pattern (1984) (learning through actual experience, through reflexive observation, through abstract transpose in concepts and through active experiments)
- the Honey and Mumford pattern (1992) that remakes Kolb pattern (militant workers, reflexive people, theorists and pragmatic people)
- the Bernive McCarthy’s 4MAT pattern(1987) includes four leaning styles
- the Gardner pattern (1993) made based on the Theory of Multiple Intelligences
- the Dunn&Dunn pattern
- the Richard Felder and Linda Silverman pattern (1988) that form a learning styles fan through combining eight peculiarities: active or reflexive, actual or intuitive, visual or verbal, sequential or global;
- the Fleming and Mills patter that identify four learning styles: visual, auditory, reading-writing and kinaesthetic at which are added the fifth- multimodal- a combination of, at least, two style out of those mentioned before.

The learning style is depends, to a great extent, on the way the information is perceived and processed. It is known the fact that at cognitive level, a able-bodied person processes easier the information visually perceived than a person with visual deficiency where perceiving information is made especially through the capable senses, auditory and tactile-kinaesthetic. (Preda, 1999).

Honey and Mumford (1992, quoted by Preda, 2006) defined four styles of learning: active style, reflexive style, theoretic style and the pragmatic style:

- *The active style*- preferring to actually get involved in an experience through the desire of extending the „now and here” activity.
- *The reflexive style*- is indicated by the prudence and the profound meditation before taking decisions or acting. Observation, listening, the exhaustive accumulation of the facts before expressing an opinion, are essential. Coming back to some events and revise all that has happened are important behaviours. It is characterised through the desire of making decisions without temporary restrains.
- *The theoretic style*- the desire of analysing and synthesising, an interest for basic premises and for the subjacent principles, through turning to good accounts the reason and objectivity. This preference is stimulated when a person has to understand and explain through systematically exploration, the links between ideas or through confronting with systems, pattern or theories. Following a systematic step is very important in approaching problems.

- *The pragmatic style*- interest for valuing ideas, theories, techniques in the specific purpose of validating their functioning. It is characterised through a preference indicated by the practical and realistic, through preferring to make useful decisions and for solving the actual problems. Answering to an immediate well-identified need, finding actual benefits, finding practical advantages, are considered as being very important dimensions of learning. (according to Preda, 2006)

If we refer to teaching as an act of functional processing, then defining teaching styles refers to the ways, the routes the student (or the one who is learning) uses deliberately in each step of this process-phenomenon:

- perceiving or picking up the information (produce a state of attention, focus on the material that needs to be studied, the active recording of the actual facts with the help of perception as a psychical process)
- understanding the material (through analysis, synthesis, analogy, generalities, comparisons, materialisation, making parallels, classification, inserts etc)
- assimilating knowledge, facts (making generalisations, drawing conclusion, principles, theories, ideas, concepts etc)
- to strengthen and consolidate in memory (short and long term)
- putting the knowledge into practice (as a consequence, but as well as a premise of strengthening and consolidation)
- Bringing up to date knowledge and different, varied, adapted and subjectively filtered situations; operating and using the adjusted knowledge and the demands.
- Transferring the knowledge, namely using the knowledge in other contexts/new situations, close or different than those that have been assimilated

However, the nowadays exigencies in learning point out educational aspects, namely, training, consolidating and developing certain capabilities, competences, performances, aptitudes, attitudes, abilities, work techniques (intellectual and driving, psychophysical), reason for which the learning style (school related) can be defined as a particularly way, preferred by a person who studies and is formed under the surveillance of a person that is in charge of his development, through whom it succeeds to gain knowledge and the necessary facts to form and develop a capability, skill, dexterity, habits, necessary to adjust to the new life or learning context.

Basically, when learning is regarded, many refer to school learning (because it is the most organised, ordered, rigorously evaluated and adjusted). Nevertheless, when we talk about learning styles, we do not have to forget other „forms” or learning types: learning in an informal environment and the spontaneous learning within the informal context. The three forms interpenetrate and influence each other. Judging from the temporal aspect, learning is tutorial at the childhood age spent within the family, so it is extremely influenced by the cultural, educational patterns of that family, as well as the learning styles of the parents (considering that he is a child, at young ages he learns by copying, imitating the parents, the grandparents). The learning styles are, therefore, influenced by others learning styles of those close, but it is also conditioned by the cognitive style of the person

learning (the quality of the input, of the so-called processing and of the informational output), as well as a set of other important dimensions such as: motivational, emotional, volitional, attitude related, attitude related and character related.

We consider that the learning style can be influenced and conditioned by the material or content that is meant to learn. The educational offer, with which the one learning gets into contact, can shape the direction, the modalities, strategies, methods, ways that the individual chooses to follow/use. Obviously, cognitive styles are decisive in choosing paths in comparison with the educational offer.

Finally, shaping a learning style depends on the „context” that through its repeating facts may influence/determine building a relatively unique way of acting and learning. For the example, the family context, school context, social context put across in certain educational environments (the environment or context of the chemistry or biology laboratory, the environment of your group of friends, peers, the context of the library where people frequently read or learn a poem or a story), can influence forming a learning style.

Teaching styles

Talking about learning style of the educational target, we may also refer to learning styles of the subject of the education as we may theorise the instructive-educational collocation).

„To teach” represents a concept that does not reduce oneself to transmitting some information, but especially to challenge, organisation, administration and relieving learning. As the nowadays didactics is concerned, teaching is not an activity reduced to the single role of the teacher- that of a mere knowledge transmitter, but an ensemble of activities. The teacher gets new roles in the process of teaching: mediator, adviser, supporter, organiser etc, and maybe, in the last place, that of a knowledge transmitter, because the focus is on the child, on what he is learning, is being trained, not on something that would ease his learning (the magistocentrism is switched to peurocentrism).

Therefore, if we take into consideration, the multiple tasks of the teacher, the teaching style represents the teacher’s ways of action with students in particular work situations. This is related to the capabilities of the teacher to establish relations with students, to lead, to administrate a class of students or a learning group without bringing prejudices to the methods and the techniques put into practice (Therer, 1998). Through his teaching style, the teacher resorts to a wide range of information from different fields (methods, techniques, attitudes, skills) so that he can adapt to the situation given. The fact that in the teachers’ action concern there are several styles of teaching, increases their ability to cope with the interaction situations of the students.

Therer and Wilemart (1984), analysing Blake and Mouton’s work (1964) from the management field, identified and described for teaching styles. These styles are defined beginning with the bi-dimensional model that combines two attitudes of the one teaching: the attitude towards the taught subject and the attitude

towards those teaching. These attitudes are stated in different levels, weak or strong, with interest or without interest. The combination between these two attitudes allows the identification of four basic styles (according to Therer, 1998):

- The „transmissive” style- focused on the subject that is being taught
- The „incitative” style- focused at the same time, on the taught subject and on those learning
- The „associative” style- focused, especially, on those learning
- The „permissive” style- very little focused on those learning and on the subjects

Henson and Borthwick (1984, quoted by Sternberg, 1997) suggested the existence of six teaching style categories: task oriented, co-operant planning, teaching focused on the student, teaching focused on discipline, teaching focused on learning and the emotionally stimulated teaching style.

Studies that have had in view the efficiency of teaching styles are based, most frequently, on estimating school performances through achievement tests starting from low level cognitive targets, without taking into account the change of attitude (Therer, 1998). In the process of choosing the best teaching style, Therer (1998) highlighted four criteria in choosing the most efficient teaching style in different contexts.

a) The kind of the educational targets- it is taken into consideration the circumstances and preferences of the teacher along with the socio-emotional targets, the psychomotor targets (using devices). The socio-emotional targets may be reached if the teacher uses an urging or associative style.

b) The motivational level of the student- using some strategies focused on the student makes them gain a feeling of success, responsibility and development, encouraging learning motivation.

c) The cognitive ability of the students- the students with difficulty in processing information prefer a more ordered, formal style compared to other students that prefer an associative style (Davies, 1971; Dupont, 1982, quote by Therer, 1998).

d) The learning style of the students- each student organises, in time, a personal learning style based on his way of perceiving and processing the information. As mentioned before, each individual has a certain propensity for a certain style of perceiving information. Some prefer the information that are presented visually, graphically or auditory.

Conclusions

The learning style and the cognitive style are distinctive concepts although they are seldom mixed up. But, of course, the cognitive styles influence the learning style, the later being useful, to a bigger or smaller extent, at increasing the efficiency of cognitive styles. Learning style can be developed through practice and experience.

A fact that should be seriously reckoned in research, is referred to the extent in which the cognitive styles are reflected in learning styles, and also to the extent in which the teaching styles take into consideration the peculiarities of the cognitive style, given by the type of personality and the attitude and value traits referred to different types of information with which the person gets into contact. So that the information with which the person gets in contact becomes operational and can be used in a personalised manner in different school and professional contexts, it is imposed to define and evaluate the both cognitive and learning styles. Identifying the cognitive styles together with the mediating and moderate variable particular to each person, through a valid psychological device that would reveal pragmatically the factors that compose the cognitive and learning styles, is imposed. In the existing context, emphasizing (in case there are) some characteristics of the cognitive styles in case of disables persons, would influence considerably, the corrective-compensational and instructive-educational process.

A student with a cognitive style that harmonizes with the style of the teacher that teaches in the classroom or the one that is training him at a certain subject, has better chances to have positive learning experiences. The same thing is available for the members of a work team if the cognitive styles of the members are in harmony and focused on the same level of aspirations as they will all feel the same positive experiences. If there is a correspondence between cognitive styles in the environment in which we work, this thing will make us feel more comfortable when we have to work with others. However, this does not guarantee success.

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SCIENCE TEACHER COMPETENCIES; THE PROFILE OF AN EFFICIENT TEACHER IN ORGANIZING GROUP ACTIVITIES

ADRIENNE KOZAN NAUMESCU

ZUSAMMENFASSUNG. In diesem Artikel ist das Profil eines effizienten Professors aus dem wissenschaftlichen Bereich, basiert auf einem Set von Kompetenzen, didaktische und psychopedagogische. Die Arbeit folgt verschiedene Aspekte der Schülerorganisation im Bereich Lern-Sequenzen, außerdem die Rolle des Professors bei den Aktivitäten von Gruppen der Schülern in dem pre-universitärischen Lern-System.

1. INTRODUCTION

Many researchers, trainers and associations, currently working on proposing standards for science teachers' education and profession, have tried to analyse the new role characterising the science teacher by focusing on the involved "*competencies*". This concept is considered relevant in all professional fields and particularly in education research, given the fact that these processes are based on interactions amongst human beings.

A definition proposed (De Ketele ,1996) is the following: "A competence is a set of organized capacities (activities), which act on contents in a given category of situations in order to solve a problem." In this definition a competence is described as an ability to carry out a specified task or activity to predetermined standards of attainment. According to Spector, (www.pisa.oecd.org) "competence refers to a state of being well-qualified to perform an activity, task or job function. When a person is competent to do something, he or she has achieved a state of competence that is recognizable and verifiable to a particular community of practitioners. A competency, then, refers to the way that a state of competence can be demonstrated to the relevant community".

A "competence" has been defined as a collection of resources (knowledge, know-how, knowledge to be) mobilized to solve problems in a particular context. (Roegiers, 1997).

Other researches (Niess and Scholz, 1999,) have tried to analyse what Science Teachers (ST) know and what they do in their classrooms in terms of different kinds of *Knowledge* and *Competencies* recognised as relevant. They report that these are very difficult to factorize or to separate in well defined groups and that a picture that can capture them and their relationships is that of a net where, as first order approximation, regions of similarity can be pointed out,

evidenced, but not enucleated from the context. The recent literature and many reforms in the field of science teacher education suggest (Zeidler, 2002) that teacher preparation has a “threefold structure” with the anchoring pillars being Subject Matter Knowledge (SMK), Pedagogical Knowledge (PK) and Pedagogical Content Knowledge (PCK).

2. CATEGORIES OF PROFESSIONAL COMPETENCIES

The Competencies have been structured in three broad areas (SMK, PK and PCK) and different sub-categories have been identified in each area. Boundaries between different sub-categories are flexible ones, the proposed classification being a first order approximation.

2.1. Subject Matter Knowledge(SMK)

Three different categories of competencies have been identified:

I- *Knowledge of the discipline.*

The claimed competencies are:

- Master an appropriate subject knowledge;
- Identify the main scientific concepts of the discipline and their relationships;
- Have a sound knowledge of latest research results.

II- *Knowledge about the discipline.*

The claimed competencies are:

- Identify methods and processes of science;
- Have a sound knowledge of different epistemologies;
- Understand the unifying role of models and modeling procedures;
- Identify the relevant steps of historical evolution of Science;
- Build awareness of the social relevance of the topic.

III- *The discipline in a multidisciplinary scenario.*

The claimed competencies are:

- Identify the main concepts of the various scientific disciplines;
- Clarify the relationships between Science and Technology;
- Frame phenomena in a multidisciplinary context;
- Integrate mathematics in the different scientific disciplines;

2.2. Pedagogical Content Knowledge.

Five different categories have been identified.

I- *Teaching/learning processes.*

The claimed competencies are:

- Awareness of the need to transform content knowledge in an appropriate knowledge for teaching;
- Awareness of methods and strategies able to help a learner to build her own knowledge net;

- To be able to connect the observation of phenomena (biology, physics, chemistry) to their representations and models present in the disciplinary body of knowledge;

- Awareness of constructivist practice;
- Knowledge about learning (conception and conceptual change);
- Reconstruct subject knowledge.

II- *Representations of disciplinary contents suitable for teaching.*

The necessary competencies are:

- Using of various models and representations in order to fit student reasoning;
- Being able to guide students in building and organizing their knowledge;
- Stimulating students in using different representations (verbal, iconic, mathematical,...) of the same phenomenon.

III- *Pedagogical methods and tools aimed at scaffolding learning*

The claimed competencies are:

- To manage approaches getting students to execute minds and hands-on activities, gather evidence, reflection upon evidence and propose rational evidence based arguments.

- Using Information Technologies as cognitive tools;
- Using Computers as laboratory tools;
- Using Computers for different representations (verbal, iconic, mathematical,...) of the same data;
- Using Computers for visualization of mechanisms and behaviors;
- Use conceptual maps;
- Favor modeling activities starting from experimental data;
- Relate everyday-life phenomena with scientific models;
- Integrate lab-work with theory;
- To be able to use PC;
- Appropriate use of ICT

IV- *Relevant characteristics of students' common-sense knowledge.*

This includes the following competencies :

- Searching for common knowledge model of students in the introductory phase of new topics;

- Know students' conceptions and misconceptions in science;
- Know students' mental models;

V- *Students' learning difficulties.*

The claimed competencies are:

- To be able to understand students' difficulties with respect to the objectives targeted by learning materials;

- To be able to make appropriate revision in the sequence of learning activities as needed to increase the likelihood obtaining the stated objectives;

- Know learning/teaching difficulties;
- Address students' conceptual nodes.

2.3. Pedagogical Knowledge.

Three categories have been identified.

I- Knowledge of relationships between teaching strategies and learning practices:

- Vary activities in order to improve memorization and meaningful learning.
- Appreciate difficulties students can meet in learning something and their own capabilities with regard to what to learn.

II- Knowledge of pedagogical methods and instructional strategies.

The claimed competencies are:

- To be able to plan a lesson to account for the needs of all students;
- To be able to select teaching/learning strategy to meet specific learning outcomes: to organize group work; to define specific goals; to speak clearly and demonstrate properly, to address at an adequate language level.
- To be able to integrate different tools in the teaching process.

III- Knowledge of professional tools for class and curriculum managing.

The claimed competencies are:

- organize evaluation of his/her teaching in terms of student learning;
- sustaining of learning environments;
- interact and collaborate with students;
- manage class life;
- favor group-work;
- monitor learning/teaching process;
- adapting assessing procedures to class objectives;
- perform clear evaluation procedures.

3. THE PROFILE OF AN EFFICIENT TEACHER IN ORGANIZING GROUP ACTIVITIES

The concept of **TEACHER**, is a new one, having in view the ensemble of competencies presented in paragraph 1 and 2 of this paper. Each teaching situation means an unique variable sets: the teacher personality, the psychological features of pupils, the curriculum characteristics could be only some of these variables. A question of nowadays didactic is: "How could be attended the objectivity in teaching-learning process.?" A successfully teaching isn't so easy to be realized, in spite of the fact that the teacher knows the theoretical aspects of it.

As concerning the teaching process in class, a very important aspect of science teacher competencies is to organize the pupils activity in groups. There are two features which are very important in this case:

- The group size
- The affiliation to the group

The group size: in a large group the competition is stronger, the variability is better and the pupils roles are more differentiated. So, there are significant

differences: in style, frequencies and period of conversations; of course, in this case the non-verbal behaviour is very important.

The affiliation to the group: the way in which the pupils are affiliated to the group, depends of educational aims, but in the same time of social aims. As a general rule a heterogeneous group will be the better way to fulfil the tasks. This form is recommended in the case when the pupils' groups has to attend the identical tasks in the teaching-learning process. If the tasks are differentiated, function of the psychological resources of the class, the pupils' group could be homogeneous.

Of course: age, sex, personality criteria should be take into account.

In the heterogeneous groups there are some advantages: the good people will solve the problems, and the lazy one will be more collaborative, receptive should ask more questions.

A group should be seen like a group and not like individual qualities!

An efficient teacher needs some sensibilities in following the group activities in the sense that he/she has to know the individual particularities of each member of the group.

During groups' activity, a science teacher could have different roles:

- ✚ The leader-instructor
- ✚ The neutral "chair"
- ✚ The facilitate teacher (efficient)

The leader-instructor

This type of teacher is a traditional one, but it is not the desired, in up to date teaching. The danger is that the pupils could be dependent and constrained at teachers' demonstrations. In this case, the teacher risks to impose a very authoritative atmosphere.

The neutral "chair"

The teacher only controls the teaching-learning process, but doesn't contribute to the content; this is a model of a democratic atmosphere.

The facilitate teacher (efficient)

The teacher is involved in listen to and in stimulate the pupils. This is in French so called "laissez-faire" (leave to make). This means that he is fixed on the pupils, aiding them to express what they understand and to respect them for: **what they are and not for what they should be.**

CONCLUSIONS

An efficient science teacher has to prove an ensemble of competencies: subject matter knowledge pedagogical and pedagogical content knowledge.

In a modern didactic, the teaching-learning process has to be a learning activity, so the pupils could construct the new knowledge during the instructional activity.

It is obviously that the efficient teacher is desirable in a knowledge based society, in an European context.

The educational objectives, consider that the pupil has to “build” the new knowledge (Naumescu A., 2006) has to “discover the notions, the concept at the level of any discipline. This important task is in the hand of science teacher.

Don’t forget that the actual pupils will be the “tomorrow society” , put in the situations to take important decisions, to solve the problems, not only in science, but also in the economic and social fields.

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MODALITES DE DEVELOPPEMENT DES COMPETENCES DE RECHERCHE DANS LE DOMAINE DES SCIENCE DE LA NATURE

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ZUSAMMENFASSUNG. Das Durchführen der Veränderungen am Lehrplan bewirkt die Entfaltung zahlreicher grundsätzlichen Fähigkeiten, die zur Verwirklichung bildungserzieherischer Zwecke im Rahmen einer weiten individuellen wie auch sozialer Entwicklung beitragen. Dabei müssen insbesondere die Bestimmung und Wiederbestimmung des Begriffs „Fähigkeiten“ in Betracht gezogen werden mit Hinsicht auf ein Bildungsumfeld das sich ausschließlich durch das Übermitteln von Informationen in jenes Bildungsumfeld zu beschreiben lässt, für welches der Lehrplan gilt, der sich auf Entscheidungsbildung, die Festlegung und Auswahl der für die Grund- und Oberstufe benötigten Kompetenzen beruht. Diese Kompetenzen widerspiegeln sich im Lehrplan und werden in dessen Zielsetzung und Anforderung vorgesehen, wobei die Einschätzung zentraler Fähigkeiten angemessene Indizes verwendet.

La compétence peut être définie en tant qu'habileté d'accomplir pleinement une tâche, une activité, vues dans toute leur complexité. Cette définition fonctionnelle et centrée sur les exigences est soutenue par la compréhension des compétences vues comme étant des structures internes, habiletés et capacités de l'individu, qui correspondent à des accoutumances cognitives et pratiques. Celles-ci entrent en relation entre elles, étant associées aux éléments de connaissances, motivation, valeurs et jugements moraux, attitudes, émotions et autres composantes sociales et comportementales qui sont mobilisées et mises en action dans un contexte particulier (Rychen, Tiana, 2004).

Korossy (1997) fait la distinction entre la compétence et la performance. Les compétences sont mises en œuvre par une personne pour résoudre un problème et ne sont pas observables directement. La performance représente le comportement, la réponse observable que la personne élabore. Les compétences, les exigences et les performances entrent en relation entre elles. Les compétences représentent des propriétés, structures internes des personnes, tandis que les exigences reflètent la nature des problèmes. L'observation de la modalité dans laquelle les performances se réalisent ne permet pas l'identification des compétences qui ont contribué à les atteindre.

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L'éducation a comme finalité la compréhension du monde dans lequel nous vivons, avec des informations et des aspects concernant la flore, la faune, la culture, les gouvernements, les religions, l'argent, les villes, les bâtiments et spécialement les gens. D'après Manning (1998) le système du curriculum traditionnel est un promoteur de la présentation de manière isolée d'un grand nombre d'informations et de données et non pas dans le cadre d'un système transdisciplinaire dans lequel des transferts de connaissances et d'informations sont aisément possibles. Il s'agit aussi de la réalisation d'habitudes fonctionnelles, basées et mises en fonction à la suite du traitement des événements et des contextes d'apprentissage et de vie.

Principes qui gouvernent l'éducation des compétences

- Les compétences peuvent être acquises par des modalités multiples. Le simple fait de connaître ne permet pas d'atteindre une compétence. D'autres expériences qui soutiennent l'apprentissage vont renforcer l'acquisition des compétences.
- Le curriculum unique n'est pas suffisant pour la définition de l'acquisition des compétences. Les enfants doivent avoir accès aux opportunités uniques et doivent parcourir un programme adapté à leurs besoins spécifiques afin d'acquérir les compétences.
- Les facteurs de risque impliqués dans l'élaboration du curriculum doivent identifier avec précision les caractéristiques du groupe-cible et le niveau des compétences atteint à la fin de la période de formation.
- Les compétences de recherche deviennent partie des compétences générales étant appliquées dans les contextes spécifiques du déroulement des tâches.
- Le cadre de l'éducation des compétences doit être monitorisé et adapté aux nouvelles approches et aux informations du domaine de la science (Marzano, R.J., D.J., Pickering, 1998).

Compétences nécessaires dans le domaine des sciences de la nature

Compétences fondamentales :

- Poser des questions concernant un aspect sur lequel l'élève devient curieux, la préparation d'un plan d'investigation des hypothèses formulées, le déroulement du processus d'investigation et l'analyse des résultats ;
- L'utilisation des observations systématiques et des expériences en vue de la confirmation des hypothèses ;
- L'application des méthodes numériques et d'un équipement spécifique pour le domaine des sciences de la nature pour le déroulement de la recherche ;
- L'utilisation d'informations qui se retrouvent dans les médias et sur Internet.

Compétences nécessaires:

- Le planning et le déroulement des études dans des domaines divers des sciences de la nature ;

- L'examen et la description des espèces de fleurs et de plantes, ce qui implique aussi de connaître les parties composantes des plantes et aussi les fonctions de chacune ;
- La description des caractéristiques des vertébrés et l'explication des parties de leur corps ;
- L'examen et la description du processus de germination, de croissance et de développement des plantes ;
- L'examen et la description des espèces d'animaux, de leur modalité de reproduction et de croissance ;
- L'examen et la description des caractéristiques principales des minéraux et des rochers et de la manière dans laquelle ils se sont formés ;
- Le déroulement d'expériences concernant le magnétisme et l'électricité; la description et l'explication des résultats ;
- La description de l'utilisation des sources d'énergie dans la période antérieure et dans la période contemporaine, avec la description des conséquences sur l'environnement au niveau local mais aussi global ;
- La description de la structure des substances et de la modalité dans laquelle celle-ci se transforme en utilisant les concepts d'atome et de molécule ;
- Le déroulement des expériences qui incluent des réactions chimiques et la description des caractéristiques de ces réactions ;
- Le planning, la construction et l'essai des dispositifs mécaniques, l'explication des principes du transfert mécanique ;
- La description du système solaire et le fait de noter les théories qui expliquent l'origine des plantes ;
- La description de la manière dont le système solaire explique les phénomènes observables comme le cycle jour-nuit, les phases de la lune etc.

Pendant les dernières années, un intérêt croissant s'est manifesté pour promouvoir l'éducation permanente et pour stimuler le développement de la pensée critique et l'éducation des compétences, ainsi que la construction des connaissances actives et l'application du principe de l'apprentissage par l'action. L'école doit encourager les élèves à exprimer leurs idées, doit offrir des opportunités pour l'apprentissage par découverte et pour le développement des habitudes de traitement actif. En ce sens, le curriculum doit être fondé sur les approches méthodologiques suivantes :

- le développement de la qualité et de la performance dans les connaissances acquises ;
- le développement de stratégies cognitives diverses ;
- l'utilisation de l'approche de la problématisation et d'autres formes d'apprentissage soutenu ;
- l'intégration de la théorie à la pratique ;
- l'apprentissage pour l'apprentissage ;
- le développement des compétences d'être indépendant, créatif, d'une pensée rationnelle-critique.

Les écoles ne doivent pas être fondées uniquement sur la transmission d'informations et de données, de connaissances scolaires, mais surtout sur les connaissances et les habitudes utiles dans la vie. L'accent doit être posé sur les processus de définition et de promotion de la compréhension conceptuelle, les problèmes doivent correspondre aux situations de vie réelle. L'acquisition des connaissances dans le sens classique du terme est importante, mais le fonctionnement et l'applicabilité de ces connaissances dans la vie dépendent beaucoup de l'acquisition d'autres concepts et de l'éducation de certaines accoutumances comme la problématisation, la flexibilité et la communication. La recherche empirique, qualitative et quantitative a contribué à l'élaboration d'une théorie de la pensée, du savoir et de l'apprentissage (Bransford et collab., 2007).

Comment peuvent les écoles contribuer à l'éducation de ces compétences?

Dans le cadre de l'approche constructiviste et de l'introduction du curriculum dans le domaine des sciences, une importance spéciale est accordée à l'exploration des idées et des explications offertes par les élèves. Ces idées et ces explications sont testées, actualisées et remplacées par d'autres dans les processus d'exploration active, d'investigation et d'argumentation. L'accent est posé sur le développement des habitudes de traitement de l'information : l'observation, le fait de formuler des hypothèses, la prédiction, l'investigation, l'interprétation des résultats, le fait de formuler des conclusions et les communiquer (Harlen, 1993).

En vue du développement de ces habitudes il faut créer des opportunités pour le déroulement des activités qui permettent :

- l'exploration des matériaux et des objets en utilisant toutes les voies sensorielles ;
- la manipulation des matériaux et des objets ;
- la reprise des processus et des activités ;
- le planning, la construction, la réalisation ;
- la division du tout dans des parties et la recombinaison des parties dans le tout ;
- la représentation graphique des plans réalisés et des plans pour l'avenir ;
- l'essai des idées par des investigations ayant un contrôle initial des variables ;
- l'observation des événements et des séquences/étapes en utilisant un équipement, des appareils et des instruments ;
- l'identification de modèles dans le cadre des processus ;
- l'identification de la causalité de certains phénomènes.

Pour un niveau plus élevé d'abstractisation et de précision des situations plus différenciées vont être élaborées, comme par exemple :

- l'investigation étendue et la résolution de problèmes qui mettent en question les idées et les habitudes des élèves ;
- le planning des investigations et leur évaluation critique ;

- la discussion autour des questions et l'identification de celles qui peuvent être mises en cause ;
- les réflexions critiques sur le travail en tenant compte des perspectives différentes et des modalités possible de réalisation ;
- l'utilisation d'une catégorie élargie de sources.

Les études de Hart et Nolan (1999) concernant la recherche dans le domaine des sciences de la nature ont été axées sur le développement méthodologique dans ce domaine et sur la diversité des approches. Hart et Nolan considèrent que les professeurs doivent apprécier correctement les activités des élèves et leurs connexions avec la vie de tous les jours, avec les structures sociales complexes dans lesquelles ils vivent, dans lesquelles ils entrent en relation avec des environnements différents. Dans ce contexte, les élèves doivent acquérir eux-mêmes des compétences d'investigation et être motivés et instruits dans cette démarche pratique de la connaissance de l'environnement, en mettant face à face leurs propres notions et idées avec la manière dans laquelle la nature évolue et se manifeste (Havas, 2002 apud Hart et Nolan, 1999).

La modernisation et l'actualisation de la méthodologie utilisée dans le domaine des sciences de la nature ont déterminé l'apparition de l'éducation pour l'environnement, qui combine les éléments de la géographie avec les éléments du milieu naturel.

Dans cette situation, l'utilisation de nouvelles méthodes et stratégies interactives a été nécessaire, par l'intermédiaire de celles-ci l'élève s'impliquant et ayant accès aux processus et aux transformations qui peuvent avoir lieu dans le cadre de certaines expériences. Ainsi, l'élève peut acquérir des concepts et des compétences qui lui permettent une investigation plus précise et plus valide du monde dans lequel il vit. Le domaine des sciences naturelles doit être traité de manière holistique et interdisciplinaire, en relation avec une approche écologique qui crée une responsabilité envers l'environnement.

Les différentes variantes de modification du contenu et de la structure du curriculum doivent tenir compte de la possibilité de réaliser des transferts interdisciplinaires, en mettant l'accent sur les méthodes et les stratégies d'apprentissage interactives et actives. Les contenus sont de plus en plus orientés vers le principe de la fonctionnalité, pour assurer l'éducation des compétences qui puissent résoudre les aspects problématiques soulevés par la société du XXI-ème siècle, tels que les ressources limitées de la terre, et l'identification des modalités de résoudre les effets de la pollution. Dans ce même contexte, il s'agit aussi d'assurer une connaissance de plus en plus précise de l'univers, avec une technologie de plus en plus avancée qui permet la découverte de structures et de nouveaux organismes et l'analyse des aspects qui tiennent de l'éthique et de la responsabilité envers l'évolution de l'environnement.

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L' EFFET DE FRAMING ET LES BIAIS HEURISTIQUES- FAUTES À EVITER DANS LA CONSTRUCTION DU CURRICULUM DE L' ÉDUCATION ENVIRONNEMENTALE

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ZUSAMMENFASSUNG. Dieses Studium deutet eine Serie von Arbeitsgrundsatzes des Lehrplans, schauend Wissenschaft, fuer die Schueller mit Geistlichebehinderungen, anhand von entsprechend neue Untersuchungen aus dem Bereich Intellektuelle Procedur. Gleichzeitig behandelt es breit und weit das Framing Effekt und die Stoerungen, die aus eine Anpassung des Lehrplans ,mit Pozitive Disziplin fuer Schueler mit Geistlichebehinderungen entstanden ist.

Les recherches de plus de 50 ans sur le comportement décisionnel (voir Kahneman, Slovic et Tversky, 1982; Kahneman et Tversky, 2000; Pious, 1993; Simon, 1956; Slovic, Richtenstein et Eischhoff, 1977; Tversky et Kahneman, 1981) ont démontré que la prise de décisions éronées n'est pas douée seulement à une manque d'information en fonction de laquelle on réalise les appréciations, mais on y ajoute:

- a) Un degré élevé de la plasticité de l'appréciation (Slovic, 1995) en fonction de la façon où l'information est présentée (framing effect ou l'effet de cadration);
- b) La dépendence exclusive de ceux qui prennent des décisions d'une série d'heuristiques qui produisent tout le temps un biais systématique dans la prise de décisions (Kahneman et autres 1982)

L'effet de framing:

Un obstacle extrêmement rencontré et très beaucoup étudié dans le processus de la prise de décisions est l'effet de framing (Arvai et Mascarnhas, 2000; Haglcy et Miller, 1990; l'Yisch, 1993; Gregory, Lichtenstein, et MacGregot, 1993; Tversky și Kahneman, 1981 cités par Arvai, Campbell, Baird et Rivers, 2004). Le cadre d'une décision est esquissé par la façon où le décideur conceptualise le problème que la prise de décisions impose, étant essentiellement déterminé par les modalités de présentation de l'information. Ce cadre est, donc, déterminé aussi, par la manière dans laquelle le décideur définit le problème décisionnel tel: les valeurs, les normes, les habitudes que le décideur met au travail en fonction de circonstance (Kahneman et Tverski, 2000). Autrement dit, le degré où les valeurs et les normes d'un décideur bien intentionné se reflètent dans la décision prise, dépend du mode où l'information est présentée et puis contextualisée.

Il est très bien connu l'exemple d'effet de framing présenté par Tversky et Kahneman(1981) qui ont présenté le scénario suivant sur deux échantillons d'élèves:

Imaginez-vous que la population des Etats-Unis doit se confronter à l'extension d'une maladie asiatique très étrange à la fin de laquelle 600 personnes seraient mortes. Pour que la maladie soit combattue on a proposé deux programmes alternatives.

Au premier échantillon on a demandé de sélectionner une des alternatives suivantes:

- a) Le programme A qui pourrait sauver un nombre exact de 200 personnes;
- b) Le programme B selon lequel il y a la probabilité de sauver un nombre exact de 1/3 de personnes des 600 personnes qui vont mourir, mais il y a aussi la probabilité que 2/3 des 600 personnes ne puissent pas être sauvées.

On a demandé au deuxième groupe de sélectionner une des alternatives suivantes:

- a) le programme C suppose qu'un nombre de 400 personnes vont mourir;
- b) le programme D présente la probabilité que 1/3 des 600 personnes ne meurent pas et la probabilité que 2/3 des 600 personnes puissent mourir .

Dans le cas du premier groupe la majorité des sujets ont opté pour le programme A (72 %), les sujets du deuxième groupe ont préféré le programme D(78%). On peut remarquer que le programme A= le programme C et le programme B= le programme D. La différence entre les programmes présentés aux deux échantillons consiste pour les programmes A et B qu'elle sont présentés en termes de sauver la vie, et les programmes C et D en termes de perdre la vie.

Des résultats similaires ont été constants dans des études différentes qui ont visé la protection de l'environnement (voir Gregory, Lichtenstein et MacGregor 1993) pour une étude plus récente sur l'effet de framing qui a impliqué comme framing le nettoyage de l'environnement en termes de régénération ou amélioration de celui-ci;

Ces études ont attiré l'attention sur le fait que la coïncidence de même problème active de différentes stratégies de prise de décisions. Dans un cas, les choix qui impliquent des alternatives cadrées en termes de profit (des vies sauvées , surface refaite, reconstruite) sont motivés par l'aversion en ce qui concerne le risque; dans un autre cas les choix qui impliquent les mêmes options, mais ils sont cadrés en termes de perte, sont guidés par la responsabilité du risque. Donc, d'un côté les alternatives présentées au premier groupe, cadrées en termes de profit déterminent les sujets à choisir l'option fondée sur l'aversion face au risque et elles ont la tendance de choisir le programme A - qui constitue une stratégie sûre de sauver les vies, fondée sur l'aversion contre le risque . D'autre côté les alternatives présentées au deuxième groupe, cadrées en termes de perte, stimulent le comportement d'assumer le risque à diminuer la perte de vies.

Les biais euristiques

En plus, la plasticité d'un jugement se fonde sur la manière dans laquelle l'information est cadrée , la qualité de la décision étant influencée aussi de la démarche instinctive de la personne en ce qui concerne la prise de décisions.

Dans une grande variété de contextes décisionnels les gens ont la tendance de s'appuyer exclusivement sur les principes de l'heuristique, tout en réduisant les tâches de jugement complexe à de simples opérations (Kahneman et alii, 1982; Mellers, Schwartz et Gooke, 1998). L'avantage de l'emploi des heuristiques consiste dans une économie de temps et d'effort – sollicitées pour prendre des décisions sans compromettre la qualité du choix surtout dans le cas des décisions de routine(ex la réalisation d'une approximation proche de numéro optimum des réponses suggérées par les modèles normatifs). Malheureusement l'emploi des heuristiques peut déterminer des biais systématiques en particulier dans le contexte des appréciations complexes ou inconnues.

La disponibilité heuristique, par exemple est appliquée lorsqu'un décideur (decident) évalue une alternative ou bien il apprécie un événement (en ce qui concerne le nombre d'apparitions antérieures ou dans bien des cas en ce qui concerne le contexte où il est présent), étant très sûr sur soi-même du point de vue de la facilité d'avoir accès dans son mémoire à des exemples ou des situations similaires . (Tversky et Kahneman, 1974; Worthen, Baker, Hutchens et Nicodemus, 2002 cités par Arvai, Campbell, Baird et Rivers, 2004). Par exemple les élèves peuvent arriver à la conclusion que l'incidence des attaques des requins envers les gens se considèrent élevée à cause de l'attention augmentée que mass media a accordée à ce sujet dans les saisons d'été de 2001 et 2002. Les élèves peuvent aussi apprécier comme un degré élevé la probabilité de production des accidents nucléaires par association à Cernobil, par exemple. Ce problème de la disponibilité heuristique consiste dans le fait que mêmes événements, voir les exemples plus avant (Arvai, Campbell, Baird et Rivers, 2004) sont plus faciles à rappeler non parce qu'ils sont très probables à apparaître(en fonction de nombre d'incidents) qui ont le même sujet ou lorsqu'on les compare avec des données de référence, voir le cas des requins), mais grâce au fait qu'un tel événement s'est produit récemment ou bien il a réalisé une audience culminante dans le mass media(grâce à la fonction que le contexte où l'événement a eu lieu, acquiert).

De même, la représentation heuristique est utilisée par les gens pour estimer la probabilité d'un événement , cela étant influencé par le degré où une personne considère qu'un événement dont on parle , par exemple , un événement X est représentatif ou ressemble à un autre. L' application d'une décision pour l'événement X parce que la personne pense qu'il est similaire à l'événement Y pour lequel celle décision- là a eu du succès, étant considéré représentatif, va déterminer un biais systématique de l'estimation de la probabilité de la véracité des éléments du scénario activé (Kahneman et al, 1982). Par exemple, si on demande à un élève à apprécier lequel des deux événements a la plus grande probabilité à se produire:

a) la fissure d'une conduite à une usine chimique déterminerait la contamination des eaux souterraines;

b) la fissure d'une conduite à une usine chimique qui s'est produite à cause de la négligence dans le travail pourrait déterminer la contamination des eaux souterraines.

En se rapportant à la représentativité Fhiske et Taylor, (1991); Pious, (1993) cités par Arvai, Campbell, Baird et Rivers, (2004) démontre que , parce que le deuxième scénario est plus crédible à cause des détails plus nombreux, la probabilité de choisir des gens est plus grande lorsqu'on leur demande à évaluer.

Puisque les probabilités combinées ou conjonctives sont le résultat d'une opération multiplicative (le contraire d'une relation supplémentaire), ainsi que la surveillance des installations dans le cas d'une usine chimique, le deuxième scénario, naturellement , est moins probable à se produire.

La troisième situation de biais euristique est l'amorçage sans adaptation suffisante. Lorsqu'un groupe d'élèves est demandé si le nombre d'oiseaux qui pourraient mourir au cours de l'année prochaine est plus grand ou plus petit de 5, ils considèrent que le nombre d'espèces qui pourraient mourir est plus grand. Quand on leur demande encore une fois à estimer le nombre d'espèces qui vont mourir, ils considèrent que 50 espèces est un nombre raisonnable. Lorsqu'on demande à un autre groupe à estimer si le nombre d'espèces qui vont mourir comme conséquence des changements du climat global, est plus grand ou plus petit de 3000, ceux-ci considèrent que le nombre est plus petit.

Donc, quand on demande au deuxième groupe à faire une appréciation exacte sur le nombre d'espèces qui vont mourir ils considèrent que celui-ci est de 350 espèces. Les différences qui existent dans les appréciations réalisées par les deux groupes sont explicables en termes d'appréciation qui se réalisent par rapport à un point de référence initial (de 5 à 3000 espèces dans cet exemple) et l'adaptation insuffisante dans le sens inférieur ou supérieur par rapport à tout cela (Kahneman et al., 1982).

La dimension de l'effet induit par l'amorçage sans adaptation suffisante aspire à être élargie quand le décideur(décideur) se confronte à des problèmes qui ont été enseignés peu de temps avant. (par exemple l'assimilation de nouveaux concepts au cours des leçons de sciences). Certes, l'amorçage sans adaptation suffisante joue un rôle important dans l'accomplissement des appréciations, ce qui nécessite l'évaluation ou la prise en considération des données scientifiques quantitatives(voir le cas antérieur). Cet effet se manifeste aussi lorsqu'on demande au décideur à se concentrer sur des sujets importants qui nécessitent un choix imminent. Dans bien des cas les décisions des gens sont influencées par les premières informations qui leur passe par la tête, ce qui diminue les informations qui s'activent apparemment plus tard dans le processus de prise de décisions. En ce qui concerne plusieurs décisions sur l'environnement ceux qui prennent des décisions se focalisent sur des coûts financiers associés aux bénéfices de l'environnement (valeurs culturelles, services écologiques telle que la réduction de la quantité de monoxyde de carbone de l'atmosphère). Les coûts financiers son présents un peu plus tard dans le

processus décisionnel, mais ils sont incorporés sûrement dans l'évaluation finale de diverses alternatives en ce qui concerne la manière où l'action va se dérouler. (Arvai et Gregory, 2003; Arvai, Gregory, et McDaniels, 2001; Farina, Arce, et Novo, 2002).

Le quatrième biais possible comprend **la dépendance extrême envers le contenu affectif de l'appréciation**. Bref, l'effet est défini comme un état émotionnel que la personne vit directement, par exemple l'arousal (ex: joie, tristesse) ou la valeur qu'une personne confère à un stimulant: positif ou négatif, adaptatif ou qui ne peut pas être adaptatif. Pour que les problèmes de l'environnement soient connus, les études antérieures sur l'éducation de l'environnement ont accentué l'idée que l'offre curriculaire doit s'adresser aussi bien aux besoins cognitifs qu'aux besoins affectifs des élèves. (Heimlich, 1992; Hungerford et Volk, 1990). Les résultats des recherches sur les appréciations et le processus de la prise de décisions ont repris cette nécessité (voir Damasio, 1994). Des études plus récentes (Finucane, Alhakami, Slovic et Johnson, 2000; Slovic, 2000) ont commencé à se focaliser sur l'idée que les affects jouent un rôle plus important dans le processus de la prise de décisions que l'analyse cognitive d'un problème. Par exemple on peut prendre en considération le scénario suivant: les élèves doivent prendre des décisions en ce qui concerne l'allocation des ressources pour nettoyer trois locations différentes contaminées:

- a) la désaffectation d'une usine qui produit des armes nucléaires;
- b) un dépôt pour des engrais utilisés en agriculture;
- c) les résidus d'un tunnel creusé pour la construction d'un système

d'irrigations pour les fermes d'alentour. De l'analyse des trois locations on s'attendrait que la première provoque une forte réponse affective négative en ce qui concerne le degré de risque.

Ayant comme support les heuristiques affectives on s'attend que les élèves (qui ne reçoivent pas d'aide dans le processus décisionnel pour l'allocation des ressources pour les trois allocations) allouent le plus de ressources pour la décontamination de la première location (l'usine de production d'armes nucléaires) par rapport aux autres deux locations. Cette attente a été confirmée par une étude réalisée à l'Université d'Oregon (Arvai et Gregory, 2003). Bien que chacune des trois locations possèdent de divers degrés de risque, mais aussi l'usine d'armes nucléaires des trois locations contaminées n'a pas le plus élevé degré de risque en ce qui concerne la contamination (le dépôt d'engrais présente le risque le plus élevé pour la santé de l'homme), les résultats de l'étude qui vient d'être présentés, relèvent que les appréciations individuelles sont fortement influencées beaucoup plus par des affects que par une évaluation plus profonde du degré de risque dans les trois locations contaminées. Il est bien connu le fait que l'effet de framing comme les quatre biais heuristiques se manifeste aussi au niveau des appréciations individuelles qu'au niveau des appréciations de groupe.

Cette idée est très importante à retenir parce que les dernières années on prête une importance extraordinaire à la stimulation du travail par petits groupes

(Basili și Sanford, 1991; Cohen, 1994; Lundeberg și Moch, 1995). Les difficultés qui viennent d'être présentées ne s'arrêtent, donc, ici en ce qui concerne le processus décisionnel, mais elles peuvent être accentuées à cause des biais qui peuvent apparaître. Selon l'opinion d' Arvai et alii, 2001, le meilleur exemple de dynamique du groupe est probablement la méthode *Groupthink* (Janis, 1982). Une série de caractéristiques de la méthode *Groupthink* sont bien connues telles: la pression de se conformer directement en qualité de membre si on a une opinion contraire à la majorité du groupe, l'autocensure d'une position plus lointaine par rapport au consentement qui existe en apparence à l'intérieur du groupe et un faux sens de l'unanimité. (Arvai et al., 2001). De même, en *Groupthink* la conformation inclut la tendance d'abandonner les propres croyances et opinions et de se conformer parfois lentement au point de vue de la majorité (Asch, 1956; Horrobin, 1990).

Curriculum fondé sur la prise de décisions

Dans le paragraphe antérieur on a essayé de démontrer qu'on peut optimiser la qualité des décisions que les élèves prennent par: l'offre des informations détaillées en ce qui concerne le problème étudié, mais les élèves doivent être aidés aussi à se former des habitudes qui leur permettent l'application de l'information dans le processus de la prise de décisions (Simmons, 1991). Si les activités supplémentaires en classe se fondent sur un contenu curriculaire par la prise de décisions qui soit souvent associé aux leçons sur l'environnement on pourrait développer aussi la conscience des pièges psychologiques qui biaisent le processus décisionnel, qu'une série d'habitudes d'apprentissage de l'information (sous la forme des valeurs personnelles et des informations techniques) qui stimulerait les processus cognitifs et implicitement la qualité des décisions.

Une série d'études dans le domaine de l'éducation pour l'environnement (ex. Hansen, 1996) ont souligné le rôle de la dissonance cognitive comme moyen de stimulation du processus décisionnel. Autres études récentes qui appartiennent au domaine des sciences de la décision (Arvai et al., 2001; Gregory, Arvai, et McDaniels, 2001; Hammond, Keeney și Raiffa, 1999; Keeney, 1992) fournissent un autre set de principes de guide dans ce domaine avec des résultats considérables dans l'optimisation du processus de la prise de décisions (ex., le dépassement de la plasticité des appréciations, des biais) dans le contexte de l'éducation pour l'environnement. On rappelle la démarche „Common Sense” et la démarche fondée sur la structure de la décision.

La démarche „Common Sense”

Pour développer les connaissances scientifiques des élèves le curriculum doit suivre la formation des habitudes de la prise de décisions aux élèves par l'introduction des leçons qui leur permettent de suivre les fautes diverses qu'ils peuvent faire dans le processus de la prise de décisions et les possibilités d'éviter

ces fautes; Dans ce sens, les leçons sur l'environnement peuvent être associées aux leçons d'histoire et de sciences sociales qui les aident à surmonter les biais qui viennent d'être rappelés. Dans l'analyse et le choix des alternatives pour le management de l'environnement les élèves peuvent être encouragés à lancer des discussions sur les implications historiques et sociales du problème auquel ils se confrontent. Par exemple, un problème peut être l'extinction (ou même la mention du niveau actuel) du pouvoir nucléaire des Etats Unis. Pour répondre à ce problème avec „non” l'argument doit se fonder sur l'idée que le risque est trop grand et l'appréciation de ce risque est influencée aussi par l'aspect émotionnel du problème, que de la manière du mass media de divers accidents nucléaires récents (ex; Cernobil) . pour donner une réponse correcte et complète à ce problème les élèves peuvent être stimulés à faire l'exercice suivant: estimer combien de jours une centrale nucléaire fonctionne normalement et combien de jours la centrale a de graves problèmes de fonctionnement.

L'objectif d'un tel exercice à l'aide duquel on investigate le background de l'engendrement de la production de l'énergie nucléaire à une centrale identique , est de dépasser le biais tout en constatant que le nombre des jours où une centrale nucléaire fonctionne normalement est significatif plus grand par rapport au nombre des jours où on constate des problèmes de fonctionnement (s'évitait le biais qui a comme fondement la disponibilité heuristique).

La démarche fondée sur la structure de la décision

Bien que la démarche „common sense” soit utile dans plusieurs contextes décisionnels , les problèmes du milieu sont suffisamment complexes pour que les stratégies mentionnées plus avant aient une valeur limitée dans le processus de la prise de décisions rationnelles. En ce sens , les professeurs de sciences doivent inclure dans leur démarche didactique une séquence de pas qui inclut implicitement la déroulement d'un processus de prise de décisions. La nécessité de suivre une telle démarche dans l'enseignement est bien connu sous le nom de „decision scientists”(la décision de l'homme de science) il manque, en général aux gens l'habilité de définir intuitivement le domaine complet de leurs préoccupations , ce qui est nécessaire alors qu'on leur demande des changements complexes tels que les décisions sur l'environnement. Les conséquences se reflètent dans le fait que les décisions qu'ils prennent satisfont seulement en partie le domaine des préoccupations parce qu'il ne comprennent entièrement les changements qu' implique les dimensions conflictuelles de la valeur (Bohnenblust și Slovic, 1998). Un processus décisionnel structuré spécifiquement détermine les élèves à parcourir les étapes suivantes (Hammond et al., 1991)

- le définition spécifique de la décision qui va être prise;
- l'identification „à ce qui compte” en termes de valeurs personnelles exprimées comme objectifs dans le contexte de la prise de décisions et la création d'un set d'alternatives pour attirer leur but;

- la synthèse des informations techniques convaincants qui reflètent les conséquences des alternatives et qui permettent la réalisation d'une évaluation authentique des changements/

Tout curriculum qui se propose d'améliorer les capacités des élèves de prendre des décisions devrait viser la prise en considération des facettes multiples du même problème décisionnel (Hungerford și Folk, 1990). Pour exemplifier la démarche structurée sur la décision on pourrait mettre en discussion le concept de développement durable. Bref, ce concept continue dans une manière qui ne dépasse la capacité de régénération des ressources. Ce concept est perçu par la majorité des gens- adultes et élèves comme abstrait où réalisable seulement au niveau supérieur décisionnel(par exemple au niveau des agences gouvernementales). Enseigner les élèves définir cohérent la problématique d'une décision signifie de les stimuler entre „la pensée décisionnelle” de David (décision thinking) et pensée automatique („automatic thinking.”).

La pensée décisionnelle implique la définition d'un problème (ex, le développement durable) dans une manière qui prend en considération rationnellement les objectifs et plus tard suppose la création des alternatives de déroulement de l'action au cours de laquelle on prend des décisions à l'opposé de la pensée automatique apparue dans des situations où une évaluation incomplète a eu lieu à cause de la suprasollicitation des aspects émotionnels ou à cause de l'application des biais heuristiques (la disponibilité, la représentativité etc). Par exemple, probablement la manière la plus évidente de cadrer les problèmes associés au développement durable est la focalisation sur des ressources naturelles. La majorité des ressources sont utilisées sur une échelle qui dépasse beaucoup leur possibilité de se régénérer (ex; le sciage, le pétrole etc). Puisque cet aspect du problème est facile à être abordé il suit la concentration sur des stratégies de conservation des ressources qui impliquent le choix des ressources spécifiques alternatives (développement limité, utilisation à efficacité maximale du combustible) .

Le problème du développement durable peut être cadré aussi dans des termes de ses effets sur le développement mondial- par exemple , par application d'un management efficace de la pêche peut être perturbé l'approvisionnement des communautés locales et limité l'apport à l'économie de marché (Clarke, 2002 cité par Arvai, Campbell, Baird et Rivers, 2004). L'élaboration du curriculum de l'éducation pour l'environnement en prenant en considération la définition de la décision et d'autres cadres de la décision assure le dépassement des biais heuristiques s' identifier et se stimuler la création des élèves.

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GEOGRAPHY AND CONSTRUCTIVISM. LEARNING SITUATIONS STARTING FROM IMAGES

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ABSTRACT. Geography and Constructivism. Learning Situations Starting from Images. In the first part of our paper we present several theoretical aspects on constructivism, radical constructivism, cognitive constructivism, and on the social one. We started our study from the premise that students did not have the competence to analyse and interpret reality and its representations correctly and that was why they needed guidance in constructing their knowledge, being directly helped by their teacher or indirectly, through tasks that contained explicit prescriptions. In this paper we want to present and analyse certain learning situations organized starting from images, from the perspective of moderate and social constructivism. The purpose of our paper is to point out how reality may be constructed taking small steps, through identifying, analyzing, and interpreting the component elements of the reality that are present in a certain image. According to the features of the learning situation, the student is on a certain knowledge level: the level of identifying the elements of reality or from its representation, analysis of the identified elements, interpreting the identified elements, the applicative level, the synthesis and the restructuring of the identified elements. In our paper we reach the following conclusion: so that students get involved into knowledge situations structured according to the principles of social constructivism or of the cognitive one, they should first get involved into knowledge situations structured according the principles of moderate constructivism, where teachers help them to achieve knowledge models.

KEY WORDS: constructivism, knowledge, learning model, learning situation, radical constructivism, cognitive constructivism, moderate constructivism, social constructivism.

Theoretical Basis

We theoretically and methodologically based this paper on the theories of constructivism. According to these theories, one does not represent reality exactly as it is but that person constructs it either individually or in a group, through perception, discovery, experiment, analysis, interpretation, using a certain language, through realizing at mental level representations having different organizing degrees, of conformity to the reality. According to the principles of constructivism,

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knowledge cannot appear through massive acquirement of information about the world, about the reality, taught by the teacher, but it is a construction that each of us realizes independently, subjectively, without educator's assistance (radical constructivism represented by Glasersfeld, 1981, 1983, 1989, 1992, 2000; Elgedawy, 2001), in a group (social constructivism represented by Dougiamas, 1998; Derouet, 1998; Doolittle, 1999; Wilson, 2000), guided by the teacher (moderate constructivism), or through direct experience but capitalising also the data offered by culture (cognitive constructivism represented by Conway, 1997; Jonassen, 1993; Anderson, 1996; Briner, 1999; Spiro, 2001) (after Joița, 2006).

Ernest von Glasersfeld, the theoretician of radical constructivism, points out the difference between traditional constructivism where knowledge appears as a result of transmitting and receiving information and scientific knowledge constructed through direct actions by the subject. This author underlines that the experiential world is constructed and structured, and one perceives it step by step, subjectively, on elements, that afterwards one combines mentally, hierarchies, structures, relates, forming mental schemes, and conceptual structures. Glasersfeld mentions that direct activity is experiential, while constructivism – constructing knowledge – is instrumental. At the same time, one starts constructing knowledge at an early age, in school, perfects it continuously, according to personal understanding, and adds methodology and contents progressively.

Motivation

During Geography classes, one uses frequently images in order to facilitate students' understanding of and knowledge achievement about the reality. We started our study from the premise that students did not have the competence to analyse and interpret reality and its representations correctly and that was why they needed guidance in constructing their knowledge, being directly helped by their teacher or indirectly, through tasks that contained explicit prescriptions. In this paper we want to present and analyse certain learning situations organized starting from images, from the perspective of moderate and social constructivism. The purpose of our paper is to point out how reality may be constructed taking small steps, through identifying, analyzing, and interpreting the component elements of the reality that are present in a certain image.

Presentation and Analysis of Learning Situations

We shall present first learning situations constructed on the basis of moderate constructivism theory, where students build their knowledge starting from images and led by teacher's questions and controlled by instant assessment of their answers. In the first learning situation, the teacher directs students through questions in order to construct knowledge about the reality represented in an image using four cognitive levels: a) identifying elements through observation; b) analyzing the identified elements; c) understanding (interpreting) the significance

of the elements; d) the applicative level. The teacher proposes a task to his/her students that is on a superior cognitive level, that of the synthesis, when he/she asks them to elaborate graphical organizers.



Fig. 1. Landslide in the Getic Sub-Carpathians (Nicolae Lazăr)

- What elements do you see in this image? In this situation, *the level of identifying certain elements* is constructed on the basis of students' previous knowledge, and without it identification would not be possible. Students who have not achieved the concept of "landslide" identified the following: "a grassy hill", "the land slid", and "the row of trees on the top of the hill". We noticed that at this level students identified visible elements without establishing any spatial relationship between them. Declarative knowledge of *Physical Geography* that is necessary for achieving scientific knowledge about the reality include the following concepts: slope, landslide, the front where the land slides from, body of the slide, front of the slide, etc.

As a teacher uses this image so that his/her students construct the concept of landslide, the teacher should ask them questions focusing on the analysis of the previously identified elements, correlated with the landslide.

- What do you see on that part of the hill where the land slid? Students noticed the following: "the land slid in several steps", "the part at the top of the hill from where the vegetation slid is deprived of vegetation", "the land is not levelled", "the grass has been deranged and it is no longer a continuous one". Students perceived some of the features of the previously identified elements and established several topographical relationships between them. In order to form their concept of

landslide, students should understand the way it takes place, and this is why the teacher led knowledge construction through questions that focus on thinking.

- What do you think to be the cause for the land to slide? Students offered the following hypothesis: “the land got moist/damp”.

- Does this mean that any land that gets damp will slide? (*problematic situation*). How do you explain the fact that the landslide takes place now and not some other time when the land is damper? Students supposed that the land got more water than some other times. So, they established the relationship between the water quantity and the dampness of the rock stratum.

- Do you think that damp land will always slide, no matter the rock type it is made of? Students said that the most frequent landslides took place where there were clay and sand, but they could not explain the relationship between clay and sand strata and the process of sliding.

- What features do sand and clay have when they get damp? Students said that damp sand was larger when damp and that sand particles were no longer linked to each other. Students did not explain the process through which the clay became waterproof, that was why the teacher led students’ knowledge by presenting an experiment or by realizing a drawing.

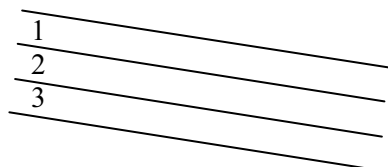
- Look at the several pieces of clay in the image. Between them there are spaces filled with air where water may infiltrate. When the clay particles get damp, they increase their volume and fill in the space previously hosting water. The phenomenon through which the dimension of the clay particles increases is called inflation. When there are no spaces filled with air between the clay particles, water can no longer infiltrate in the stratum, and the stratum becomes waterproof (*explanation through drawing on the blackboard*).

- If the strata of sand and clay are in a horizontal position, is it possible for the land to slide? Students answered “no”, but they could not identify the cause.

1	sand
2	clay
3	sand

- In what position should the strata be so that the landslide takes place? Students said that the strata should be inclined.

- Imagine, step by step, what will happen if these strata were inclined and damp.



The teacher continued to guide students through questions so that they constructed their knowledge.

- What do you think will happen with the water that infiltrated the stratum at the surface when the clay stratum becomes waterproof? Students deduced that water got the sand stratum very damp and that part of the water would slide above the clay stratum.

- What effect do you think that the water flows above the clay stratum has? Students deduced that water stratum destroyed the link between the two rock strata.

- When do you think that the sand stratum above slides? Students deduced that the sand stratum above would slide when the link between the two strata was relatively destroyed, when sand was very damp and its mass was big. They noticed the existence of a balance threshold.

- In this case, the landslide took place in a structure formed by sand and clay strata. Do you think that in reality there are no other rock structures where landslides take place? Students made the transfer to the situation when landslides should produce when water could no longer infiltrate in a base stratum and the stratum above was inclined and over damped.

At the level of interpreting the elements identified in the image, students needed not only to recall from their memory declarative knowledge and establish spatial relationships between the elements, but they also had to establish cause-effect relationships by deducting and rationalising. E.g.: *if* water can no longer infiltrate the clay stratum, *then* it makes the sand stratum above very damp; *if* water can no longer infiltrate the clay stratum, *then* it flows or accumulates above it; *if* the sand and clay strata are horizontal and damp, *then* they do not slide, etc. Then the teacher asked questions in order to facilitate students' achievement of applicative knowledge (*the applicative level*).

- What are the consequences of landslides? Students noticed diverse consequences: destruction of roads, of railways, of buildings, of vegetation, and of soil; the creation of dams for certain water courses; the appearance of lakes and smaller water bodies; the appearance of springs.

- What measures should somebody take into account so that one prevents landslides? Students proposed the following prevention measures: forestation; creating wells for water collection; realising channels for water flow from the slopes.

- If the landslide started, what could one do in order to stop it? Students proposed similar actions to the prevention ones (forestation; creating wells for water collection; creating flow channels for the water on the slopes), but they also proposed the creation of several dams situated at the front of the landslide and explosions in the mass of the landslide so that rocks mixed.

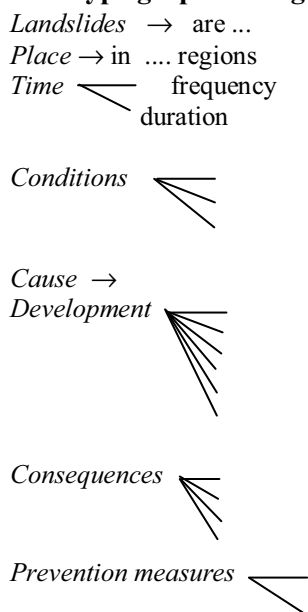
By involving students into these learning situations, they should achieve a *model of knowing a geographical process or phenomenon*, where to observe certain rules and follow a certain algorithm. In this case, students analysed the features of the rocks and of the rock strata, they deduced the changes of the physical properties of

the rocks in certain conditions (the presence of water), and the production mechanism of a landslide, the consequences of landslides, prevention measures and measures to stop them.

One may propose his/her students a superior knowledge level where they systemise and synthesize information in a tree type graphical organiser and in a vertical linear one (*the synthesis level*). If during the previous learning situation the teacher permanently guided and controlled students, during the learning situations organised according to the principles of social constructivism, the teacher may guide students indirectly in achieving/constructing their knowledge about the world, through tasks formulated differently as difficulty and competence level, through certain schemes, and the assessment takes place after solving the task. Students work in groups, follow the cognitive process proposed by the educator, but they receive feedback only after solving the tasks, and these facilitates the appearance of certain knowledge errors, if compared to the learning situation facilitated through dialoguing with the teacher.

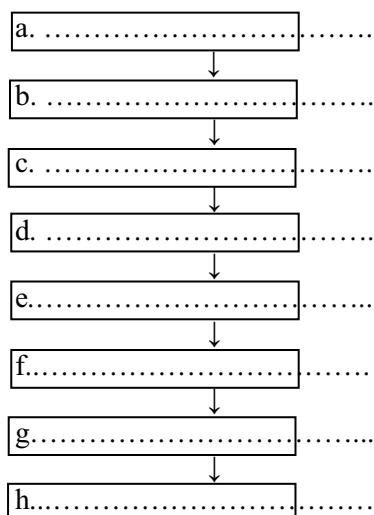
Task: Work in groups of four. Complete the tree type graphical organiser with information about landslides, information that you achieved during the previous learning situation.

Tree type graphical organiser (Dulamă, 2008)



Task: Work in groups of four. Complete on the vertical graphical organiser the phenomena that take place before and during the process of landsliding, in a chronological order.

Vertical linear graphical organiser (Dulamă, 2008)



The teacher controlled the ways to solve the tasks projected according to social constructivism, after the activity ended. These were different from one group to another that is why negotiations took place, as well as the following: completions of lacunas, error corrections, clarifications. By using these graphical organisers, students learn to structure and restructure information according to scientific criteria established by other persons. In order to undergo conscious, scientific learning, students should be aware of the algorithm of studying a geographical phenomenon or process, the criteria according to which one takes information from the reality or from its representations and structures it graphically and mentally. Students may be asked to complete a lacunary text with information achieved by studying the photography.

Task: Look at the photography and complete the following text.

A condition for a landslide to produce is the existence of an alternation of strata and of strata. A second condition for a landslide to take place is for these strata to be Even if these two conditions are observed, the landslide cannot take place in the absence of and in the absence of The landslide could not take place if the strata are damp, but in a position. The phenomenon of increasing the dimension of the clay particles is called The front where the land slides from isThe body of the landslide isThe bed of the landslide is

This text was constructed according to the following levels: *of identifying, of analysis and of interpreting the elements* from the image, and students realised the identification operations of the visible elements, the analyses, and the rationalising through establishing the cause-effect relationships. *Apparently*, solving this item places knowledge on a superior level of interpretation, but students really do more

an effort of recalling knowledge from their memory, then an effort for constructing knowledge during the completion of a lacunary text. During other learning situations, the teacher may propose students complete several lacunary texts (indirect guiding) where they use only the elements identified in the images they looked at. The teacher may guide his/her students indirectly in constructing knowledge from the perspective of social constructivism by written questions, by incomplete graphical organisers, without having studied before the geographical phenomenon or process in the image.

Task: Work in groups of four. Look at the image in figure 2 and answer the questions in the study guide.



Fig. 2. Flow ditches and rills (Nicolae Lazăr)

Questions	Answers
1) What do you see on the surface in the image? (<i>identification level</i>)	1) ... “small ditches”, “very small ditches”, “several blades of grass”, „surface deprived of vegetation”.
2) How deep do you think that small ditches are? 3) How deep do you think that very small ditches are? (<i>analysis level</i>)	2) Small ditches are about 5-10 cm deep. 3) Very small ditches are about 1-5 cm deep.
4) What external factor has determined the formation of these ditches on the respective land? 5) How have these ditches appeared on the respective land? 6) What are the conditions that favour the formation of those ditches on the respective land? (<i>interpretation level</i>)	4) These ditches have appeared because of the rainfall and because of the water coming from the melting of snow. 5) These ditches have appeared through depth erosion, step by step, after a series of rainfall sessions. 6) The conditions that favour the formation of these ditches are dependent on the following:

	soft rocks; the existence of a slope; lack of vegetation; water from rainfall or snow melting.
7) What effects will the formation of those ditches have? 8) What measures should one take in order to prevent the appearance of the respective ditches? 9) What measures should one take in order to destroy these ditches? (<i>applicative level</i>)	7) The effects of the formation of these ditches are the following: soil destruction; vegetation destruction. 8) Some prevention measures of ditches formation are the following: planting grass; cultivating plants that do not need weeding. 9) These ditches may be destroyed through agricultural processes (ploughing, weeding).

From the analysis of the answers to the questions focusing on the image, we noticed that students did not use the appropriate concepts, such as erosion, rill, and flow. During the learning situation where the teacher does not guide and control his/her students and they do not have a textbook, they do not construct scientific knowledge and remain at an empiric knowledge level.



Fig. 3. A ravine (Nicolae Lazăr)

Task: Work in groups of four. Look at the image in figure 3 and fill in the table with pieces of information about the ravine.

Table 1.

Features of a ravine that the students completed

Depth	Width	Length	Aspect of its route	Aspect of the erosion ditch	Aspect of the thalweg
>0,5 m	>0,5 m	tens and hundreds of metres	irregular, with lateral branches	with abrupt banks	irregular

Students did not fill in the table the features that the teacher expected. Especially as they did not have the possibility to do the measurements they could have done if the study would have been conducted in the field, they did not know any analysis instrument and did not have a proper basis for the necessary previous scientific knowledge.

Table 2.

Features of a ravine that the teacher completed

Depth	Width	Length	Aspect of its route	Aspect of the erosion ditch	Aspect of the thalweg
>2 m	>5 m	hundreds of metres	linear, irregular, with lateral branches	with a V profile or a trapezoidal one	in steps

So that students are aware of the evolution of the landforms from flow ditches to rills, gullies, ravines, the teacher may propose a learning situation structured according to the principles of social constructivism, where students should compare these landforms according to certain criteria. As the teacher does not lead the construction of knowledge and he/she is not a source of information during the respective learning situation, students obtain the necessary information from a text they are to study.

Task: Work in group of fours. Read the text in the annex and look at the images in figure 2 and 3. Complete on a Venn diagram the features characteristic of the flow ditches, of the rills, and those common to both landforms. Complete on a Venn diagram the features characteristic of the gullies, of the ravine, and those common of both landforms. Compare landforms starting from the following criteria: the geomorphological agent, type of the water flow, geomorphological processes, depth, width, length, aspect of the route, aspect of the erosion ditch, aspect of the thalweg, the component parts.



Annex. The flow is the incipient concentrated flow of the rainfall water and of that resulting from snow melting on inclined surfaces. The water may concentrate in small and in large flows. The geomorphological processes are the flow, linear erosion, regressive erosion, and depth erosion, transport, and lateral erosion. The landforms created through flowing are the flow ditches (linear erosion incipient forms from 1 cm up to 5 cm deep that self destroy after the rainfall) and rills (linear erosion incipient forms over 1 m long and up to 20 m deep, that disappear through ploughing).

Ravines appear as a result of linear erosion produced by the concentrated flow of the rainfall water and of snow melting in strong, temporary flows. Geomorphological processes are: regressive and depth linear erosion, lateral erosion, transport, and accumulation. The landforms that appear through this type of flowing are the gullies (erosion ditches with an irregular linear route of relatively small dimensions, 0,2-2 m deep and 0,5-5 m wide, with the thalweg parallel to the slope) and ravines (big erosion ditches with lateral branches, hundreds of metres long, 2-30 m deep, 5-80 m wide, with a V or trapezoidal profile, with thalweg in steps).

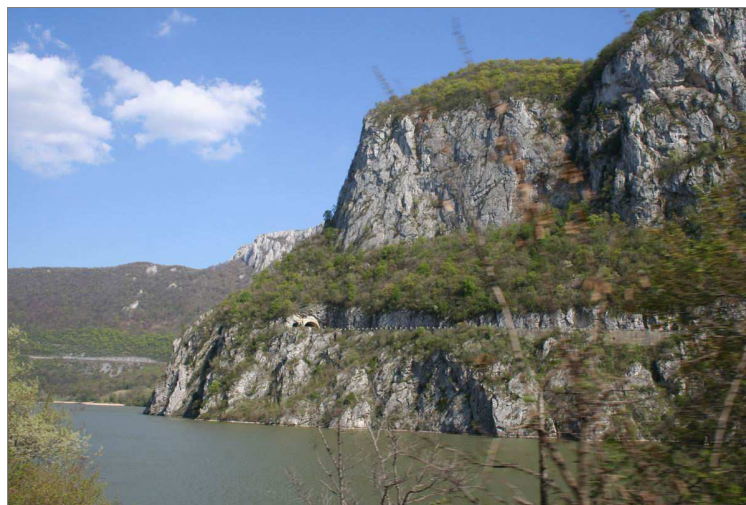


Fig. 4. The Danube Gorges (Bogdan Pop)

After students achieved knowledge models for the geographical phenomena and processes, they could take part to knowledge situations constructed according to the principles of radical constructivism, when they constructed knowledge by themselves, in a subjective way, without teacher's intervention.

Variant 1. Task: Each of you should look at the image (figure 4). Elaborate a literary description of this image observing the features mentioned in the annex. You will read the literary description in front of the class. Five minutes!

After reading the description, students answered the following questions: While your colleague described the image, could you imagine reality as it was represented in the image? What should anyone complete the description with so that you may represent the image in a closer way? Students were aware that they tried harder to use a literary language than rendering better the landscape in the image (Dulamă, 2008).

Variant 2. Task: Each of you should look at the image (figure 4). Elaborate a scientific description of the image observing the features mentioned in the annex. You will read the description in front of the class.

After reading the description, students answered the following questions: Which are the concepts used in the scientific description? Has he/she mentioned place, time, the visible component elements, phenomena, and processes, their consequences? (Dulamă, 2008).

Variant 3. Task: Each of you should look at the image (figure 4). Elaborate a scientific description of the image observing the features mentioned in the annex and using the following concepts: slope, gorges, chalk, valley, interfluve, terrace, step, erosion, Karst. You will read the scientific description in front of the class. Five minutes!

After reading the description, students answered the following question: Has your colleague used correctly the concepts in the presented text?

So that students solve the tasks correctly, they either know how to realise a literary or scientific description, or the teacher presents them the requirements in a highly detailed way. The task of scientifically describing a landscape is on a superior knowledge level, that of the synthesis. So that students elaborate a scientific text correctly, they should be involved into knowledge situations such as those presented previously, they should know the models for analysing landforms, and those for the analysis of the relationships between the elements of the environment.

Variant 4. Task: Work in groups of four for five minutes! Look at the image (figure 4). Formulate at least five questions that you will ask your colleagues and on their basis they should be able to analyse and to describe the components of the environment in the image. Formulate at least five questions and on their basis your colleagues should be able to interpret the elements identified in the image and the relationships between them. One student will present the image and they ask him/her questions starting from the respective image. This student will listen to the answers and offer feed-back (Dulamă, 2008).

When students receive this task they know what analysing and interpreting an image means and which are the questions that are part of the two questions categories. Students should be aware that questions should be asked in a certain logical order so that the construction of scientific knowledge is allowed.

Table 3.

Analysis and interpretation of images where there is a dominant element (Dulamă, 2008)

Analysis	Interpretation
<ul style="list-style-type: none"> – identifying and naming the dominant element – characterising/describing a dominant element 	<ul style="list-style-type: none"> – explaining its significance: Why is it there? What are the relationships between this element and those secondary in the respective image? What are the effects of its presence?

Table 4.

Analysis and interpretation of images where there is a composition of elements (Dulamă, 2008)

Analysis	Interpretation
<ul style="list-style-type: none"> – identifying and naming the component elements situated in the foreground, in the background and in between – naming the type of the elements (natural or anthropic) – describing the composition of the elements (landforms, hydrographical units, plants and animals associations, anthropic elements, soil types) – comparing elements (form, dimension, density, colour, etc.) 	<ul style="list-style-type: none"> – identifying the relationships between the elements of the composition (temporal, spatial, cause/effect, etc.) – explaining the relationships between the elements of the environment: Why is there a certain element? What relationships are there between an element and the other elements in the respective image? What effect does one element have upon the others?

If students have not been involved into learning situation where they would have achieved a certain model for knowing and certain models for structuring the information, they would have run a great risk of solving incorrectly the tasks. The knowledge the students would construct about the geographical phenomena and processes, would certainly be lacunary, with errors, and incoherent. Students certainly construct knowledge individually, but if the teacher involves them into learning situations organised according to social constructivism, in order to assess their way of solving the task, they would be asked to present the products they realised: to present what they wrote; to present a graphical organiser; to answer questions, etc.

Conclusions

During the exemplified learning situations, first we reached the conclusion that, according to the features of the learning situations, students were on different knowledge levels: that of identifying the elements of reality or of its representations, that

of analysing the identified elements, that of interpreting the identified elements, the applicative one, the synthesis or the restructuring of the identified elements.

Secondly, so that students get involved appropriately into a learning situation constructed according the principles of cognitive, social, or radical constructivism, they should be first involved into learning situations characteristic of moderate constructivism when the teacher help them achieve knowledge models.

Thirdly, during learning situations organised from the perspective of moderate constructivism, where the teacher leads and controls strictly everything, students have better chances to achieve scientific knowledge than in a learning situation constructed from the perspective of social and radical constructivism.

Finally, during the learning situations organised from the perspective of social or radical constructivism, students achieve more skills for knowing the reality or its representations than during learning situations constructed from the perspective of moderate constructivism.

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LA REACTION CHIMIQUE UN CONCEPT INTEGRATEUR DE LA CHIMIE

FLORENTINA CIOMOŞ

ABSTRACT. Generally it is very useful and benefic that every conceptualization to use the pupils conceptions. In this context the wrong conceptions may be improved and the right ones may form a cognitive structure that fulfils the function of a reception structure (the right conceptions of the pupils generate a cognitive state of expectation) and a supporting function (the pupils renders and assimilates the scientific notions based on the existing concepts) This article gives-away partially the forming operation of the incorporation concept of the chemical reaction. In this way there are tests applied on a great number of pupils that distinguishes a series of pupil's conceptions (right, half-scientific or wrong conceptions) regarding the chemical conversion. These conceptions have been structured and based on a criteria of psycho-genetic development of the pupils and the criteria of the presence of a connection between the notion of „substance” and „chemical conversion”. Finally the relevant conceptions by testing always on one hand to give-away the inherent obstacles forming the concept of chemical reaction and on the other hand the right germination of that concept.

KEY-WORDS: conceptions, chemical conversion, equation balance sheet, substance.

ZUSAMMENFASSUNG. Allgemein ist die Verwendung der Konzepte der Schüler im Prozess der Konzeptualisation sehr nützlich und gut. In diesem Kontext können die verfehlte Konzeptionen verbessert werden und die richtige Konzepte bilden eine Struktur, die sowohl eine Aufnahmerolle (die richtige Konzepte bilden einen kognitiven Wartezustand) als auch eine Stützrolle (die Schüler verarbeiten die wissenschaftliche Begriffe aufgrund der vorhandenen) vollbringen können. Der Artikel hebt partial hervor, in welcher Weise der integrierende Konzept der chemischen Reaktion gebildet wird. Zu diesem Zweck wurden Teste an einer Großzahl von Schülern durchgeführt, das hat die Entwicklung einiger (richtigen, halbwissenschaftlichen oder verfehlten) Konzepte ergeben, die sich auf die chemische Umwandlung beziehen. Diese Konzepte wurden aufgrund des Kriteriums der expliziten Existenz einer Schaltung zwischen dem Begriff „Stoff“ und „chemische Umwandlung“ strukturiert. Am Ende haben die durch Teste entdeckte Konzepte einerseits das für die Bildung der chemischen Reaktion inhärente Hindernisnetz aufgezeichnet, andererseits aber das richtige Keimen des entsprechenden Konzepts.

SCHLÜSSELWORTE: Konzepte, chemische Umwandlung, Bilanzgleichungen, Stoffe.

1. Un cadre conceptuel pour le concept de «transformation chimique»

«La transformation (*i.e.* la réaction) chimique» est un concept synthétique, capable d'intégrer et, surtout, d'organiser un contenu conceptuel très riche. En effet, elle

suppose non seulement la transformation chimique proprement dite mais aussi l'équation bilan. Ces deux composantes varient entre le niveau micro et macroscopique (Ciomoș, F., 2003).

Un examen de l'évolution propre à ce concept chimique met en évidence un processus non linéaire (objet d'interprétations diverses, voir contradictoires) et discontinu (car le dépassement des obstacles suppose, lui aussi, des coupures successives, plus ou moins profondes et à chaque niveau explicatif).

Les recherches de ce complexe processus démontrent, pour l'essentiel, deux obstacles épistémologiques majeurs: 1. le substantialisme = la substantialisation des propriétés entraîne l'idée selon laquelle la transformation des propriétés des substances se produit sans aucun changement d'identité car les principes des nouvelles propriétés préexistent dans les substances initiales; 2. le mécanicisme = le changement des propriétés des substances se produit au niveau atomique et consiste dans le changement de la forme, de la grandeur et du mouvement des atomes.

Le premier obstacle peut donner lieu à des confusions liées à l'identification de l'état gazeux de la matière, au rôle de l'air dans les combustions, au statut de substance de la chaleur, etc. Le deuxième empêche les élèves à réaliser la distinction entre l'atome et la molécule, le passage du microscopique au macroscopique, le fonctionnement du modèle moléculaire de la matière (Martinard, 1986).

Le dépassement de ces obstacles devient possible en suivant deux voies: 1. l'abandon des approximations qualitatives dans l'étude de la réaction chimique en faveur d'une perspective quantitative, ce qui permet la différenciation des phénomènes physiques et chimiques par le biais des propriétés bien définies; 2. la précision du niveau – microscopique ou macroscopique – de la réaction chimique: chaque élément de la réaction correspond à un type d'atome défini par sa masse et sa capacité de combinaison. En d'autres mots, les réactions chimiques représentent des processus de réorganisation des atomes qui ne changent pas leur identité.

L'analyse historique de l'évolution du concept de «transformation chimique» montre bien qu'il relève de multiples formulations, ce qui devient un élément très important pour la didactique de la chimie. Stravidou, H. (1987) retient huit formules parmi les plus significatives, dans un cadre conceptuel qui met en valeur leur sens et leurs rapports.

Le premier cadre conceptuel définit la transformation chimique du point de vue qualitatif, par opposition avec les processus physiques. Les notions-clef sont, on le voit bien, «la substance» et «l'élément» chimique. Ce cadre conceptuel suppose une perspective macroscopique de la matière et de ses transformations. Le second est basé sur la théorie atomique -moléculaire développée au dix-neuvième siècle. Les concepts-clés en sont celui d'atome, en relation avec celui d'élément chimique, et celui d'ion, qui permet une première approximation de la liaison chimique. Il est associé à une idée de discontinuité de la matière et de l'énergie. Le troisième cadre conceptuel est basé sur la théorie quantique du vingtième siècle. Le concept – clé dans ce cadre est de nouveau l'atome, du point de vue de sa structure électronique. Il est associé à la discontinuité de la matière et de l'énergie.

2. Les conceptions des élèves concernant la «transformation chimique»

La chimie et ses applications pratiques sont omniprésentes dans notre vie quotidienne. L'opportunité du contact des élèves de 12-13 ans avec le concept de «transformation chimique» relève d'une nécessité pratique: celle de la manipulation des produits chimiques, avec ses effets polluants et parfois dangereux. Dans les pays occidentaux – Angleterre, France etc., l'initiation des enfants au concept de «transformation chimique» commence à 12 ans. En Roumanie, on prépare le terrain entre 10 et 12 ans surtout par l'étude des «Sciences de la nature».

C'est dans ce contexte que nous avons tenté de faire l'inventaire des conceptions des élèves sur «les transformations chimiques» et «les substances pures». Le groupe cible concerné a été formé de 343 élèves des écoles générales et des lycées de Cluj-Napoca, Zalău et Blaj, âgés entre 12 et 16 ans.

Nous allons aborder, dans ce qui suit, certains aspects concernant la germination du concept de «réaction chimique» en tant que synthèse de certaines connaissances empiriques et de certaines connaissances scientifiques (sans toucher l'équation bilan)

L'analyse des réponses données aux questionnaires a mis en évidence le fait que:

1. les élèves différencient entre deux types de transformations chimiques: naturelles et artificielles. Plus précisément, pour eux, les transformations chimiques relèvent seulement des expériences propres aux laboratoires. L'incendie d'une forêt, par exemple, n'engagerait pas une réaction chimique;

2. les transformations chimiques sont synonymes des phénomènes de destruction, de disparition ou de détérioration de la matière: un clou est attaqué par la rouille, le marbre par le jus de citron, etc.

3. certains élèves s'expliquent les transformations chimiques par un agent qui les provoque, mais reste inchangé, et un «sujet» du changement, qui subit l'action de l'agent (début, encore confus, du concept d'action et réaction);

4. d'autres élèves croient que les corps préservent leur propre identité, même si leurs propriétés peuvent changer;

Ainsi, nous avons repérées trois étapes principales dans la constitution du concept de «réaction chimique».

Dans la première étape (12-14 ans), les élèves repèrent les transformations chimiques au niveau phénoménologique: le changement de couleur, l'émission de gaz, l'explosion, etc. Autrement dit, ils définissent la transformation chimique par le changement visible des corps. Ce qui, bien évidemment, n'est pas encore suffisant, car il y a des transformations chimiques qui sont imperceptibles.

Dans la deuxième étape de ce processus (autour de 14 ans), les élèves reconnaissent les transformations chimiques seulement quand ils identifient deux corps, ce qui crée d'autres confusions:

- l'exclusion des tout phénomène qui relève d'un seul corps: le lait qui se transforme en yogourt, le vin qui devient vinaigre, etc.

- quand les élèves n'observent pas deux corps, ils inventent un deuxième: la flamme, l'électricité, la chaleur, etc. (le bois, par exemple, et la flamme produisent les cendres).

CADRE CONCEPTUEL	CONCEPTS STRUCTURANTS	FORMULATION DU CHANGEMENT CHIMIQUE
Vision macroscopique de la matière et des changements (concepts opérateurs et lois pondérales)	SUBSTANCE ÉLÉMENT	Un changement chimique est un processus de transformation de certaines substances différentes, au cours duquel les éléments se conservent. On ne peut revenir à l'état initial par des processus physiques.
Théorie atomo- moléculaire (discontinuité hypothétique de la matière)	ATOME ION	Un changement chimique est un processus de réorganisation des atomes des substances de départ, par lequel se forment de nouvelles substances. Le nombre et l'identité des atomes sont conservés.
Théorie quantique (discontinuité de la matière et de l'énergie)	LIAISON CHIMIQUE STRUCTURE ÉLECTRONIQUE DE L'ATOME	Un changement chimique est un processus au cours duquel les liaisons établies par les électrons externes des atomes se brisent pour en former de nouvelles, constituant des substances différentes de celles de départ.

Figure 1. Cadre conceptuel pour le concept de «transformation chimique»

Dans la troisième étape (14-16 ans), l'idée d'une structure propre à la matière gagne du terrain. Des réponses comme: «La réaction chimique suppose deux molécules fassent un nouveau molécule» sont de plus en plus fréquentes. Pourtant, les définitions, que de telles réponses engagent d'une manière implicite, sont vagues car la notion de «structure» n'est pas encore vraiment opérante, le transfert du macroscopique au microscopique reste difficile et la nouvelle molécule n'est pas toujours associée au produit de la réaction.

Aussi, selon la présence explicite de la connexion entre la notion de «matière» et celle de «transformation chimique», les réponses des élèves pourront être organisés selon trois niveaux de complexité et d'abstractivité.

Au premier niveau se situent les réponses où la description sera plus importante que l'explication et où la relation entre le micro et le macroscopique sera absente:

- la matière est perçue comme un tout continu et uniforme, ses propriétés dépendant de critère d'ordre culturel ou perceptif;

- les phénomènes ne sont pas perçus comme des changements matériels – physiques et chimiques –, mais seulement en tant qu'événements spectaculaires. En fin de compte, ils sont différenciés selon les critères propres à la vie quotidienne (utilité, effets, etc.);

- à son tour, la transformation chimique représente quelque chose de spectaculaire. Elle n'est pas un processus, mais un événement qu'on peut décrire sans pouvoir rendre compte – par une explication – de la transformation en elle-même ou de la conservation des produits impliqués dans le processus.

Au niveau second, on constate une grande diversité de formulation concernant la diversité de la matière comme les premières explications sur les transformations, perçues comme modifications ou déplacements:

- la matière est composée de substances – pures ou mélangées. On ne fait pas encore la différence entre la notion d'«élément» et celle de «substance» ;

- la matière est formée de substances simples (les éléments) ou composées (sans distinction entre «mélanges» et «composés»). Les substances simples sont formées d'atomes, les substances composées, de molécules;

- la distinction entre les changements physiques et les changements chimiques relève de l'apparition ou la disparition des substances ou du caractère réversible ou irréversible de la transformation;

- une transformation chimique représente un processus marqué par la disparition de certaines substances et par l'apparition d'autres substances. Il n'y a – ici – aucune possibilité de conservation;

- une transformation chimique représente un processus marqué par la disparition de certaines propriétés et par l'apparition d'autres propriétés. Cette fois-ci, l'identité de la substance est préservée.

Au troisième niveau (repéré parmi les élèves de 14-16 ans), les relations sont déjà établies entre le micro et le macroscopique et les transformations sont décrites en tant qu'interactions:

- la matière est formée de substances simples ou composées. Les élèves différencient les substances des mélanges selon les liaisons chimiques. Ils affirment que les substances sont formées d'atomes, de molécules, d'ions, etc.

- le critère de différenciation entre les phénomènes physiques et les phénomènes chimiques relève de la conservation ou non des substances initiales;

- au niveau macroscopique, la transformation chimique s'explique comme transformation de la nature de la substance, mais avec la conservation de la nature de ses éléments;

- au même niveau microscopique, la transformation chimique implique un processus où les atomes se réorganisent par la disparition des certaines liaisons et l'apparition d'autres, e nouvelles, avec la conservation du nombre des atomes.

L'analyse des réponses des élèves met ainsi en évidence un obstacle épistémologique transversal - qui reste présent pendant tous les âges -, à savoir, celui du transfert entre le niveau macro et le niveau microscopique. Il est lié, aussi, aux limites inhérentes de la capacité d'abstraction propres à ces âges, ce qui fait que nombreux élèves restent prisonniers des manifestations phénoménologiques des transformations chimiques.

Evidemment, il existe, aussi, des obstacles d'ordre purement didactique, liés aux déficiences survenues dans la transmission de la métacognition entre le professeur et son élève, dans la compréhension du langage utilisé, etc. Nos résultats expérimentaux ont confirmé entièrement les conceptions mises en évidence par Martin del Pozo R. (1994).

3. L'équation-bilan

Les oscillations macroscopiques- microscopiques sont spécifiques pour le concept équation - bilan, la deuxième composante du concept de réaction chimique. A partir du moment de l'éclaircissement des formules moléculaires des réactants et des produits de réactions (sur la base de la loi des proportions définies de Proust et celle des proportions multiples de Dalton), la loi de la conservation de la masse des substances permet l'établissement de la stœchiométrie de l'équation de la réaction chimique et du bilan quantitatif. Ainsi, l'équation-bilan permet l'accès au bilan en termes des éléments, des masses et des volumes (par l'intermédiaire de la loi d'Avogadro).

Le concept équation-bilan intègre successivement les notions qualitatives et les composantes quantitatives (des lois) qui permettent la réalisation du bilan de la réaction chimique et qui part du langage symbolique, fondé sur des éléments, des atomes, des ions et aboutit à la diversité de la réactivité macroscopique.

Pour tenir compte des rapports pondéraux des éléments de l'intérieur des molécules, ou des proportions pondérales des réactifs qui réagissent, on doit avoir, d'un part les masses atomiques et d'autre part d'un opérateur qui permette le transfert de

l'espèce chimique microscopique (non détectable) dans un ensemble des espèces chimiques macroscopiques (détectables par expérience) (Krishman, S., R., 1994)

Ainsi, on a choisi comme référence pour la masse atomique $1/12$ de la masse de $^{12}_6\text{C}$ comme unité atomique de masse, et comme opérateur de transfert macroscopique le nombre d'Avogadro $N_A = 6,023 \times 10^{23}$. Cette constante a permis la définition de la mole et de la masse molaire.

A partir de ce moment, on dispose d'une grande échelle des masses atomiques relatives exprimées dans des unités atomiques de masse (uam) et d'une grande échelle de masses molaires exprimées en grammes. On a aboutit avec difficulté à la notion de masse molaire et celle de mole, d'atomes, de molécules ou ions et leur assimilation est difficile pour élèves. Avec cet «appareil chimique- mathématique» on peut passer à l'approfondissement de l'aspect formel d'équation -bilan présentée aux élèves dans un stage de début seulement par un calcul de coefficients stœchiométriques sur la base de la loi de conservation de la masse de substances avec la variante de conservation des atomes.

Le concept d'équation -bilan est difficile (Barlet, R., Plouin, D., 1994) parce qu'il n'est pas un concept empirique, mais un concept intégré dans un système théorique et dirigé (modélé) par les raisonnements formels de type hypothético-déductif. Il est un concept polysémique relevant de multiples significations en s'appuyant sur l'explicite il suggère l'implicite.

Même si l'équation-bilan présente des analogies avec l'équation mathématique, elle n'est pas une égalité. Quand on écrit:

$\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$ ça signifie que les réactants se transforment dans des produits et cette transformation respecte la loi de la conservation de la masse des substances et il ne s'agit pas d'une égalité dans le sens strictement mathématique. D'habitude l'équation stœchiométrique est une relation molaire.

On insiste sur le fait que l'équation- bilan relève de nouveau l'obstacle épistémique du au dualisme macroscopique-microscopique parce que, pour dépasser le bilan de matériaux réalisé au niveau macroscopique et pour donner un sens à l'équation- bilan on doit recourir au niveau atomique.

Pour rendre accessible le niveau macroscopique, on suggère l'utilisation d'une gamme des modèles qui peuvent englober toute l'échelle de modelages matériels, structurels, jusqu'au modelages énergétiques -formels.

La difficulté propre au champ conceptuel de la réaction chimique est liée à la relation étroite qui existe entre les concepts aux différents niveaux: phénoménologique, atomo-moléculaire. Le dépassement de la difficulté suppose la compréhension du modèle corpusculaire de la matière, du critère de conservation (de la masse et des éléments) au parcours des transformations chimiques et des valeurs qui décrivent un système et ses transformations.

Compte tenu de tous ces aspects, Martin del Pozo R. (1987) propose une sorte de texture conceptuelle associée aux obstacles. A partir de cette texture conceptuelle,

on va mentionner dans la suite quelques conceptions fausses des élèves avec les manifestations pratiques de celles-ci engendrées par les possibles types d'obstacles:

Le mesurage incorrect des propriétés générales et des caractéristiques des réactants et des produits de réaction	Obstacle didactique (de perception-installation expérimentale trop complexe)
L'application incorrecte de la loi de conservation de la masse de substances avec la variante de conservation du nombre des atomes (calculs stoechiométriques)	Obstacle épistémique et obstacle didactique.
Les calculs énergétiques (ΔG , ΔH , ΔS etc.) incorrects.	Obstacle épistémique et obstacle didactique.
Les élèves soutiennent que dans les processus réversibles la réaction aille dans une direction jusqu'à ce que tous les réactants soient consommés et puis la réaction inverse commence.	Obstacle épistémique et obstacle didactique.
Concernant le langage descriptif quotidien, les élèves (12-14 ans) peuvent considérer que: la rouille du fer, la combustion du bois ou du papier, l'acidification du vin ne soient pas perçues comme transformations chimiques	Obstacle épistémique et obstacle didactique
Le langage explicatif au niveau macroscopique explique la réaction comme réponse a un stimule (comme on le définit dans la biologie) ou réaction comme attitude contre une action (physique, le 3 ^e principe de la thermodynamique) ce qui induit un obstacle dans la pensée des élèves	Obstacle didactique

Figure 2. L'exemplification des quelques obstacles

En général, les obstacles ont un caractère implicite et ils sont assez difficiles à dépister. A la mesure où le cadre didactique les met en évidence, ils peuvent être interprétés pour n'engendrer plus des confusions et des erreurs dans l'assimilation du concept de réaction chimique (Astolfi, J-P., Peterfalvi, B., 1993).

Sans avoir la prétention d'une réponse globale des difficultés signalées on suppose qu'une bonne compréhension de la notion d'équation-bilan (qui, comme on l'a mentionné antérieurement, peut atténuer les difficultés associées à la notion de transformation chimique) demande la maîtrise de nombreuses notions théoriques qui doit être réalisée par des raisonnements formels et de type expérimental qui permettent une meilleure adaptation des concepts utilisés (Ciomoș, F., 1997).

La construction des démarches didactiques mieux adaptées aux difficultés mises en évidence implique la réalisation de la correspondance entre les niveaux de description macroscopiques (basée sur les notions d'atome, d'ion et de molécule) et duale (basée sur la notion d'équation-bilan) ce qui suppose une activité de combinaison de la perspective phénoménologique avec la perspective microscopique réalisée par des modelages successifs.

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MEDIA EDUCATION THROUGH ICT ACTIVITIES

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ABSTRACT. Media Education is very important in the 21st century. A person should be able to interpret the media messages, and to create his/her own media messages using different types of media. In many countries media education is a separate subject, in other it is integrated in other subjects. In this article ICT activities are proposed, in this way integrating media education in ICT lessons.

Medienbildung ist sehr wichtig, im 21. Jahrhundert. Eine Person sollte in der Lage zu interpretieren die Medien Nachrichten und erstellen seine / ihre eigenen Medien Nachrichten über verschiedene Arten von Medien. In vielen Ländern Medienerziehung ist ein eigenständiges Fach, in anderen ist es in anderen Fächern. In diesem Artikel IKT-Aktivitäten vorgeschlagen, auf diese Weise die Integration von Medienerziehung in der IKT-Unterricht.

1. Introduction

We are invaded by different media means and media messages every day. It is very important that a person should read these messages critically, and also should be able to create different media messages. The aim of the school would be to develop pupils' media literacy. In many countries there are separate "media literacy" courses, or these knowledge is integrated in other subjects (for example in Mother Language or Foreign Language courses), as literacy (Fedorov, 2007). In this article ICT activities are proposed. Through these activities beside ICT skills, students develop media literacy, too. In this way media education can be integrated in ICT lessons.

"Media education is a kind of engagement with the world in which we live. The study of media is not something that necessarily involves the taking of examinations although it may. It is something, which is about the world, which the media represent. So if you study the media you study the world. If you study the media you study your social existence and the social existence of others. You don't just study film and television or radio and newspapers or even the Internet. They all relate to the way people live and it is my opinion that the importance of media education is because it is about studying the way people live." (Ferguson)

2. Media education

There are many definitions for *media literacy*.

Media literacy is the ability to interpret and create personal meaning from the verbal and visual symbols we take in everyday through television, radio, computers, newspapers and magazines, and advertising; the ability to choose and select; the ability to challenge and question (Thomas).

“Media literacy proponents contend that the concept an active, not passive user: The media-literate person is capable recipient and creator of content, understanding sociopolitical context, and using codes and representational systems effectively to live responsibly in society and the world at large” (International Encyclopedia of the Social & Behavioral Sciences, 2001)

“Media literacy, the movement to expand notions of literacy to include the powerful post-print media that dominate our informational landscape, helps people understand, produce, and negotiate meanings in a culture made up of powerful images, words, and sounds. A media-literate person – everyone should have the opportunity to become one – can decode, evaluate, analyze, and produce both print and electronic media” (Aufderheide, Firestone, 1993).

Media literacy is “the ability to access, analyze, evaluate, and communicate messages in a variety of forms” (Kubey, 1997)

Over the years, media educators have identified five ideas that everyone should know about media messages (Davis, 1990):

1. *All media messages are "constructed."* Media messages are made by people, are constructed from media products made by different people.

2. *Media messages are constructed using a creative language with its own rules.* Media using different language than the language in the everyday life. The best way of understanding how the media language and message is constructed, is to create your own media, for example a video, a photo, a website.

3. *Different people experience the same media message differently.* Because of each individual's age, upbringing and education, no two people see the same way a movie or hear the same way a song on the radio. Research indicates that, over time, children of all ages can learn age-appropriate skills that give them a new set of glasses with which they can "read" their media culture (Hobbs, 1995).

4. *Media are primarily businesses driven by a profit motive.* Newspapers lay out their pages with ads first; the space remaining is devoted to news. Likewise, we all know that commercials are part and parcel of most TV watching. What many people do not know is that what's really being sold through television is not only the advertised products to the audience but also the audience to the advertisers!

5. *Media have embedded values and points of view.* Media, because they are constructed, carry a subtext of who and what is important at least to the person or persons creating the construction. It is important to learn how to "read" all kinds of media messages in order to discover the points of view that are embedded in them. Only then can we judge whether to accept or reject these messages as we negotiate our way each day through our mediated environment.

There are many forms of media, which we meet every day, as text (newspaper, Internet), photos (in magazines, on the Internet, posters, TV, etc.), films (mostly on the TV), news, audio, etc.

One of the most important media channel is the TV. Visual perception constitutes the most significant element in communication. In (Geretschlaeger,

2004) the following competencies are listed to be important for interpreting visual messages from news: perception competence/sensibility, competence related to the issue and the content, reflection competence, social and pedagogical competence, competence to act. Students spend many hours in front of the TV, so it is important to teach them, how to interpret the messages, how to filter them. They watch a lot of violence, also advertisements with products addressed to their age group (but these are not always useful, or healthy). They have to watch critically these messages.

Another very popular media for teenagers is music. But music also could have very different message, could promote different lifestyles. It is very important that students to get use to listen these music critically, as well as regarding the message (the text of the song), but also the melody, the style of the music.

Technological development made easier to create media. Nowadays it is not difficult to take photos, as many people have digital cameras; it started to be accessible to take moving images, as the prices of the video cameras decreased; it is not a problem to record sound, as MP3 or MP4 players in many cases can record audio. Also, it is simple to mix these media by computer, which is integrated in our everyday life. The young generation knows how to use the computer, and they usually spend a lot of time in front of the computer searching the net, listening music, communicating with their friend, or playing games. Teaching them how to create different media (for example movies, multimedia products, etc.) gives them an alternative way of spending their time in front of the computer, a more creative activity, than what they are usually doing. It is not difficult, from the technological point of view, to create for example a film; we can use simple programs, as Movie Maker (integrated in Windows). Thus the pupils can concentrate on the message, which they want to give with that product. Hottmann encourage school projects in different subjects, which involves making films (Hottmann, 2008).

Communication is important in media education. Also, education is communication (Jiménez). “Communication is the process through which an individual enters into mental cooperation with another until they achieve a common consciousness. Information, on the other hand, is any one sided transmission of messages from a transmitter to a receptor” (Kaplún, 1998). Thus during the lesson the teacher should facilitate a real communication not only between the educator and the students, but also between students. The importance of communication is underlined also in (Tella, Mononen-Aaltonen, 1998). The media system and the educational system are two of the most powerful channels of communication (Mowlana, 1997). Thus we could combine these two systems to make the education more efficient.

3. Examples of proposed activities

Activity 1. Writing a story based on a photo

- *Description of the activity*

Focus: reading the message of a photo

Objectives/Competencies:

ICT skills	Media competencies
<ul style="list-style-type: none"> - editing a document - including pictures in a document - using the messenger 	<ul style="list-style-type: none"> - ability to read the message of a photo - communication skills - creativity

Time: 50 minutes

Resources: a set of photos, computer network with Internet connection

Steps of the activity:

- everybody chooses a photo;
- students form groups of 3 persons, and each group chooses a photo (they have to negotiate with each other about which photo to choose);
- each group write a story about the chosen photo by messenger (each member of the group writes 1-2 sentences, then someone else writes some ideas, etc);
- each group reads their story in front of the class;
- discussion about the meaning of each story;
- each group votes the best story.

Evaluation/Reflection:

- the work of each group is evaluated by the class with the voting;
- reflection about the message of the stories;
- discussion on comparison of the message of the photo and the message of the story written about the photo.

Anticipated difficulties:

- not all the students' are creative enough to write a story

• *Observation during the activity*

This activity was made by second year university students, who are studying for a bachelor in Pedagogy.

Group A has chosen a photo with four man dressed in black cloth, with a hat, walking on a street, having in front of them many traffic signs, most of them saying "no entry". They have written a story in first person, as a memory of an old person about his/her youngness, speaking about the long walks in autumn, and saying that now his/her children are spending a lot of time just walking in the town.

Students think, that their story has an intercultural meaning about parents/ children relation, the cultural difference between age groups.

We could observe, that each member of the team has contributed to the story. There is not a straightforward connecting between the message of the photo and the message of the story.

Group B has chosen a photo with four teenager girls, all of them representing a "style of teenager life" (the rocker, the hard worker pupil, etc.) They have written a very long story about four friends, who were taken by a wind in different parts of the world, where they experienced different cultures, then finally they met again, and tell each other their experiences.

Students think, that the intercultural meaning of the story is about experimenting very different life styles, and being successful in integrating in that societies.

Most of the text was written by student A. Student C didn't write even a single sentence.

- *Conclusions on this activity*

- It is very difficult for students to convince each other about something (choosing a photo in this case), to argue. In all the groups some members have just given up their choice, they wasn't convinced by the others that the photo chosen by other is most suitable for writing a story. Also, there were students, who didn't involve actively in writing the story, because it wasn't about "his/her photo".

- Not all the team members contributed to the story, there are students, who like to be creative, and it is easy for them to write a story, but there are others, who are very slow in creating a story.

- They are very impatient when communicating by messenger: they don't wait the contribution to the story of their teammate, they just write, write, write ...

Activity 2. Writing a dialog based on a film

- *Description of the activity*

Focus: communication between cultures

Objectives/Competencies:

ICT skills	Other competencies
- using the messenger	- interaction skills
Media competencies	- discovering ways of overcome these differences/similarities
- ability to read the message of a film	- discovering differences/similarities between cultures
- communication skills	- ability to emphasize with another person
- creativity	- sensibility to an intercultural topic

Time: 50 minutes

Resources: a short film with intercultural message (maximum 5 minutes, the film should have two characters who belongs to different cultures), computer network with Internet connection

Steps of the activity:

- everybody watch the film

- discussion about the intercultural message of the film (frontal, with the whole class)

- students form groups of 2 persons, and each member of the group chooses a character from the movie (girl or gnome)

- each pair of students make a conversation via messenger trying to emphasize with the chosen character

- each group reads their dialog in front of the class

- discussion about how good each student manage to emphasize with the chosen character, how good each group manage to discuss intercultural issues and bridge intercultural differences

Evaluation/Reflection:

- the work of each group is evaluated by the class during the final discussion
- reflection about cultural differences and ways to bridge them

• *Observation during the activity*

This activity was made by second year university students, who are studying for a bachelor in Pedagogy.

The chosen film was from YouTube: The film is a short one, less then 3 minutes, it is a mixture of film and animation. A little girl enter her room playing with a ball, which roll out from the room. While she goes to catch the ball, a gnome makes a big mess. The girl's mother comes, and she upbraid her because the mess from the room. The girl observes the gnome in the window, and she goes out to find it. They meet and become good friend. The girl explains to the gnome, that she has to keep tidy her room, so the gnome helps her to make order, and her mother gives full marks to her.

After watching the movie, we had a discussion about it. Students has identified two intercultural aspects:

- people – gnomes: Gnomes are different from people, they have different values (for example in the movie we could see that they like mess, but people like order. We could observe the relation between a little girl and a gnome: they become good friends in spite of the differences between them; the little girl doesn't push the gnome away based on its looks. Also in the end the gnome helps her to make order in her room, so we could assist to a acceptance of other cultures' values.

- children - adult: We could observe a main difference between adults and children: adults don't believe in tales, in supernatural creatures, etc. The girl's mother doesn't believe, that the gnome made the mess in the room.

In the dialogs written by the students the main ideas are about the physical differences between the girl and the gnome, and some differences between their life style, everyday routine.

• *Conclusions on this activity*

- Students are not patient why communicating by messenger. They don't wait for the reply and write another question before getting the answer for the previous one. So in this way the dialogs made by students have to be rearranged to be understandable.

- There are students who don't reply quickly, others who don't wait for the replies, so it was a "dialog", in which 90% of the time only one partner was speaking, so it become mostly a monolog. Thus this type of activities is also very good to exercise an effective communication.

- It is very important to give a time limit for the dialog (for example 10 minutes), and then stop the communication. Remind the students with 2-3 minutes before the end, to have time to finish the conversation, not interrupt it suddenly.

4. Conclusions

It is very important to develop students' media literacy. ICT classes shouldn't concentrate only on pure ICT skills, but also on developing media competencies. Usually ICT class deals with the technology of creating different media, but this should be extended to other topics to: reading and creating creatively different media. It is very important that on ICT lessons lay stress on developing students' creativity and aesthetical bent, not only teach how to use a certain utilitarian program.

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FACTORS OF ONTOGENETIC DEVELOPMENT

CRISTIAN STAN

AUSZUG. Die Phylogenese ist die stammesgeschichtliche Entwicklung (biologische Evolution) der Lebewesen im Verlauf der Erdgeschichte. Der Gegensatz dazu ist die Ontogenese. Der Begriff der Ontogenese verfolgt die Entwicklung des Individuums als partikuläre Entität. Durch Entwicklung meinen wir die Gesamtheit der aufeinanderfolgenden Evolutionsetapen der Existenz eines jeden Organismus und implizit jedes menschlichen Lebewesens. Während die Entwicklung, mit ihren aufeinanderfolgenden Veränderungen, die das Individuum von seinem ursprünglichen, einfachen, primitiven Zustand, zum komplexen und stabilen Endzustand, durchmacht, eine unbestrittene Wirklichkeit darstellt, gibt es eine Vielzahl an unterschiedlichen Theorien, die über die Entwicklung und über die Faktoren die die Entwicklung bestimmen und beeinflussen, sprechen. Die Faktoren der ontogenetischen Entwicklung, die von den meisten Spezialisten anerkannt werden, sind das Erbe, das Umfeld und die Bildung. Die Meinungsverschiedenheiten stammen meistens aus der unterschiedlichen Art und Weise in der die verschiedenen Denkschulen, diese Faktoren bewerten.

The concept “**heredity**” comes from the Latin word *heres* that means heir. Heredity, understood as natural gift, can be defined as the alive organisms` capacity to transmit from one generation to another, through the genetic code, the specificity messages of a certain specie, more exactly its structural and functional pattern. In comparison with the informatics systems, heredity the existence in the person`s level the existence of certain executable “programs” that controls evolution and the human being`s development, programs in which information is written on with the help of the genetic code.

There are shortly present in the fallowing (Iacob, L., 1999) the main results of genetic research that are important for the education phenomenon.

- On genetic way there are not transmitted the predecessors` features, but a complex of predispositions and potentialities. In other words, it is without scientific reason and unjustified the expanding of the positive or negative qualities from parents, to their children.

- Besides the morphologic and biochemical features, the heredity of the psychic features is the result of poly-genetic determinations, fact that makes impossible to establish a firm causality relation between a certain gene and the structure of one or the other of the psychic processes.

- Psychic diversity of human subjects is not the exclusive result of the heredity factors action, but also the result of the environment action, the phenotype being the result, for instance of the particular interaction of the person's genotype with the general environment within which he develops his existence;
- The heredity determinations can express themselves in different moments or can remain in latent estate along the person's life as some adequate activating factors miss. Transposing the hereditary predispositions from potential state in effective functionality one depends on the existence of a specific favorable action.
- Certain aspects of psychic life are seriously hereditary determined (temperament, aptitudes, emotion) and others (character, willingness, attitudes) carry in a minor degree the heredity touch.

The comparative genetic analyses underlined the fact that human heredity, in comparison with animals' one, offers a minimal load of instinctive behaviors. This finding is enforced, beyond the concrete developed researches by the fact that without a parental adequate attending during the first life years the child losses his specificity, turning into an animal despite his humanly heredity. By comparison an animal baby, raised by humans, even from the youngest age, never loses its specificity due to its powerful genetic conditioning. Human specie is the one with the longest childhood as to the animals is given through instincts everything it has to know in order to be able to survive; the human being has to learn through systematic practice, the majority of the necessary things that ensure his survival. Judging human being at this level, it seems, having into consideration his "incomplete" genetic structure the human being comes on earth, that his survival chances are almost inexistent. Though, paradoxically, this genetic incompleteness constitutes the human specie main advantage, specie that despite the others is free from the genetic constraints. Despite its instinctive perfection, animal is inferior to the human due to his extreme specialization, specialization that determines the drastic reducing of his adapting capacity to the environment conditions. Concluding, it can be underlined that genetic determination of human specie must be understood as a natural premise for person's physic and psychic development. Through his own nature the determination is a probabilistic one, independent by the subject's in case will, bringing with him either a normal heredity whose potential must be updated and valorized, either a deficit heredity that may be compensated in a certain degree through adequate methods and means.

The concept of **environment** refers to the whole assembly of conditions and factors that characterize and define the human being's existential space. Thus, the environment includes all the elements the human subject directly or indirectly interacts along his development. Up to the indirect or direct character of the exercised influence from environment on the person's existence and development can be establish the distinction between conditions and environment factors. The environment conditions express general, global features of existence space and

manifests a mediated influence on person's development, indirect one, and the environment factors refers to the entire physic and socio-cultural direct influences.

There can be distinguished in this context the existence of two major plans within which the environment factors act on the person: the plan of the natural-geographic factors and the plan of the socio-cultural ones. Among the natural-geographic factors can be mostly included the field, the climate, the temperature and the socio/cultural factors include family, the friends group, the cultural context of the person's existence etc. It can be mentioned, clarified that the action of those two categories of factors previously mentioned as influencing the person's development is a convergent one, as the exercised determination is characterized by simultaneity and the difference between those is just a theoretic one.

From the point of view of the situational positioning of environment factors in relation with the human subject upon which they act it can be distinguished between influence of the proximal and distal environment. The proximal environment refers to all elements that constitute the context of person's daily existence, elements that are placed closely to the person. Here are included both the persons he interacts directly and repeatedly and the daily situations he faces. The distal environment, as its name suggests, is situated in a certain distance in relation with immediate physic person's neighboring and it includes in his structure elements that, even if they are far away from the human subject from the point of view of the spatial proximity, influence significantly his development: media, internet etc.

Due to the technologic rhythm progress we are now the witness to a person's progressively liberation from the influences of his proximal environment, to an increase of his exposure to the information flux, not always benefic from media. This fact implies, in order to avoid the pupils' exposure to distal bad environments from socio-moral point of view, increased requirements at the school level for developing the human subject's selection and valorizing capacities.

The extremely complex problem of the environment factors action on human subject led to the appearance of the concept of ecologic niche, concept referring to the existential and functional context of a certain specie, and on this ground of the one of development niche that considers the person's concert developing framework.

The term "development niche" refers both to the position the person takes during his existence environment and the type of relationships he develops, uses and valorizes in this context. In other words, through developing niche we understand all the environment conditions and factors the human subject interacts in a certain moment from his life (Super, C. M., Harkness, S., 1986).

The developing niche (Iacob, L., 1999) includes in its structure the following important components:

- a. the objects and the places accessible for the child with different ages;
- b. the reactions and the answers of the environment towards the child and his behaviors;

c. the adult's requests towards the child expressed in terms of encouraged competences, the age those requirements are addressed and the imposed performance level;

d. activities proposed or imposed to the child and accepted by this.

The analyze of the action and manifestation way of the environment factors on human being development underlines the fact that as in the case of heredity, the influences manifested by these are undifferentiated, probabilistic. The culture in which the person's comes on earth, the social, economic level, and the culture degree of his family are factors that for the new born has an obvious apriority character. Like the person's genetic heritage is a independent fact of willingness and its control, so is the physic environment (physic and socio-cultural) within which he develops his existence, at least in the first years of life, is one undifferentiated imposed and as a consequence it can constitutes either in an advantage and in a chance for development (it is the case of an environment appropriate for development), either in an obstacle for this (it is the case of a unfavorable environment and inappropriate from this perspective).

Even though the psycho-pedagogic Anglo-Saxon school includes education in a larger context of environment factors, we prefer, due to the proportion and to its importance in determining the becoming of the human personality, to treat **education** as specific factor, by itself. The ontogenetic development of human being develops under the very sign of those two factors discussed above: heredity and environment. This factors analyze underlined the fact that both of them practice an influence on human development, an influence as obvious as it is also a probabilistic, inducing undifferentiated determiners, positive or negative from case to case, related to the person's ontogenetic development.

In other words, the thing the human being is and what it can become, finds till this level of the analyze of the ontogenetic development, in a larger degree under the constraint of several influences, little controllable and in the case majority, discretionary: heredity, through person's native givens and the environment as socio/cultural reality within which it is place once he was born. The implicit and explicit awareness of the fact that due to the arbitrary imposed by heredity and environment, the human subject is just in a very little degree responsible to his becoming as entity gifted with rationing and willingness, society was put in the situation to elaborate and to improve concrete modalities of action direction towards compensating the undifferentiated action of those two above mentioned factors. The necessity to increase the potential control the human subject can exercise on his own ontogenetic development lead to the apparition of a limitation system of the probabilistic and arbitrary character of the influences manifested by heredity and environment. This mechanism bears the generic name of education.

From this perspective education controls and organizes the influences of the environment on the person, adapting them to the person's age particularities. In other words, education establishes the relationship, mediates and improves the

reports between heredity potentiality (what the person could become as a consequence of his native inheritance) and the conditions and the concrete possibilities of the environment. Through education action, action conceived in the already mentioned terms, the human subject's ontogenetic development know autonomy, at least partially, in report with the system created by the rigidity of his genetic inheritance and the arbitrary of the socio-cultural conditions in which he comes on earth.

Thus, most of the specialists from this field consider that in report with heredity and environment, education has a systemic, organized and aimed character, fact that turns it in the single factor with sure and exclusively positive valences upon development. Education, establish harmony within the interaction between heredity and environment and creates a socio-cultural climate favorable to update genetic potentialities, this is why we can say that education is a human activity elaborated and developed in the direction of increasing the influence and the control the human being has on his own development process.

If in what is concerned the existence of those three factors of ontogenetic development, it can be identified at the level of the researchers from this field the manifestation of a certain unanimous opinion convergence, according to the degree in which heredity, environment and education influence and/or determine the development of the emitted theories characterizes through serious divergences. In the following there are presented both the features and the defining notes of those three theoretic perspectives previously mentioned, as their relevance in the education phenomenon plan.

Hereditary perspective credits in what the human being's ontogenetic development is concern, the existence of an absolute and fix heredity determinism. Among the most important promoters of this perspective can be mentioned G. Stanley Hall, the one that is for the theory of revision, a theory according to which ontogenesis repeats phylogenies (the person's development repeats the specie's evolution) and A. Gesell, the supporter of the growing up perspective.

The heredity perspective starts from the premise according to which heredity, through genetic conditioning, governs from the beginning till the end the person's physic and psychic development, including his attitudes and his behaviors. Due to the genetic code, understood as information program of biologic nature that includes sequences of unitary order, the ontogenetic development is rigorously structured and coordinated by heredity mechanisms. The growing up thesis plays a central role in this context, having as theoretic support the premises that any alive being, including the human being, has inscribed even from his birth, as a genetic code, all the instructions that will manipulate and that will guide his development. These instructions become manifest and they activates by themselves in the moment when the being reaches a certain degree of biologic maturity. In other words, as a consequence of the being biologic maturity, there are fixated certain organic conditions that makes possible the apparition of certain behaviors that are not dependent at all on practice or learning.

Postulating the fact that the human being becoming is entirely coordinated by its genetic program and development, including the psychic one, is a correlative reflex of the being biologic maturity, the hereditary perspective limits or even eliminates environment and education among the constellation of the ontogenetic development factors.

Placing on the heredity perspective is equivalent with accepting the fact that environment is transformed from ontogenetic development factor into a simple condition for it, condition that depending to that certain person and to the situation, can only either to facilitates a more rapid development, or to slow down its rhythm. The thesis of heredity automating of the human being ontogenetic development induces major implications within the education reality. By serious limitation of the environment role takes place an implicit reducing of education importance as development factors, fact that led to the apparition of a certain direction named "pedagogic skepticism". The theory of the pedagogic skepticism postulates the idea that, in the conditions in which the direction and the phases of ontogenetic development are hereditary inscribed and determined, education loses her meaning as development factor, her role being, in the best case, to ensure an as favorable as possible climate for updating "in time" the person's genetic program.

If the hereditary theories excessively underline the genetic determination of development, the environmentalist approaches promotes, as unilateral as it, the environment factors action. By analogy with the mechanic perspective from classic physics field that sustains the idea according to which by knowing and by orientating all the forces that action upon a certain body we can exactly anticipate and control its movement trajectory, the environmentalist determinism theory asserts that the human being development can also be, in his turn entirely controlled through integral manipulation of the action of the environment factors. The theoretic grounding of the explicative paradigm previously mentioned is mostly given by the behaviorist psychological orientation, whose main representatives are J. B. Watson and B.F. Skinner. The main premise of behaviorism is that, in reality, the human being doesn't act, but react to the various stimulations from environment, human behavior can be completely analyzed and explained throughout the functional scheme stimulus-answer (S-A). Considering human behavior as a sum of reactions to the various stimulations come from the environment, the promoters of the environmentalist thinking school sustain the behaviorist point of view, respectively the fact that through controlling these stimulations can be controlled the person's reactions and implicitly his behavior and his conduct. Even if the promoters of the environmentalist perspective agree without question with the prevalence of the environment factors on the hereditary one, in what the ontogenetic development is concerned, some divergent opinions can be identified at this level, too. It can be underlined in this context the distinction between the environmentalist determinism, determinism of natural nature (geo-determinism) and artificial environmentalist determinism, determinism that stresses on economic,

socio-cultural and educational factors. Being embracing the environmentalist determinism induces at the level of the school reality the so called “pedagogic optimism”, respectively the without boundaries faith in the shaping force of education and in its capacity to generate independent development patterns, liberated by the person`s heredity inheritance.

The integrative perspective has as starting point the global reconsidering of the heredity and environment factors on human being`s ontogenetic development. The premise on which is built the integrative perspective is the one that any one sided approach of the ontogenetic development, either it is heredity type or environmentalist type, is both incorrect from scientific point of view and unproductive in actionable field. This fact requires a global and integrative approach of human being`s development, approach within which it is looked after, on one hand, the emphasizing the values and the limits of the hereditary determination, as well as those of the environmentalist one, and on the other hand the identification of the way in which heredity and environment interaction concerning ontogenetic development.

Analyzing the heredity influences on person`s development, the professionals underlined the existence of a so called “reaction interval”, hereditary determined interval, an interval that defines the limits in which the influences of any type of environment can determine changes in ontogenetic development. In other words, heredity draws in the case of every person an inferior limit (starting point) and a superior limit (ending point) of the development, the environment influences being able to manifest within those intervals.

For example, in hypothesis, an environment completely unfavorable will place the person in the close proximity of the inferior limit and an environment completely favorable will lead his development in the superior limit of the reaction interval, without the possibility that those limits to be easily crossed over. To an equally careful analyze undergoes the perspective of environmentalist determinism, being underlined in this context the fact that the environment factors are important not by themselves and through their simple presence, but just in the degree in which the subject exposed to those factors is capable and in the same time willing to adequately interact with those ones. The most frequent invoked example in this perspective is represented by the relatively common situation of some brothers who, live practically in the same environment and have a hereditary inheritance common, probably in a great degree, undergo different development trajectories, both in the psychic and the physic field.

In conclusion we can say that human`s ontogenetic development is realized in the context of the interaction between hereditary and environment factors, or, more exactly said, the environment influences the human being`s development between the limits heredity draws. In the context in which the hereditary and environmentalist determinations have an arbitrary, probabilistic character being able either to stimulate development or to block it, education has the role to limit

the undifferentiated character of those two determinations types influences and to ensure the necessary conditions for an optimal personal development.

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EARLY MONITORING OF THE PERFORMANCE OF THE YOUNGEST PRESCHOOLERS

RAMONA RĂDUȚ-TACIU, MARIA-LUCIA MUNCACI

ZUSAMMENFASSUNG. Vorzeitige Leistungsmonitorisierung der jüngsten Vorschüler. Die Verminderung des Vorschulalters offenbart die gebieterische Notwendigkeit, das Kind aus der mütterlichen Geborgenheit und Betreuung in einer Umgebung die eine fachliche Organisation der Zeit und des Spieles anbietet transferiert, um das Kind in einem wohlständig artikuliertes Programm für vorzeitige Erziehung einzuschließen.

In dem Sinne bieten wir den Vorschulpädagogen einen Überblick auf das "Gradi Fan" Wörterbuch an. Seine Anwendung benötigt gleichzeitig pädagogische Fähigkeiten, Verfügbarkeit und Zeit.

Das vorhandene Werk weist einige Beispiele vor, um die Erfüllung der ausführlich dargestellten Leistungsangaben beobachten zu können, sowie auch das offenbarte und das im Entwicklungsverlauf Verhalten. Die Beispiele beziehen sich auf die Erzielung der Vorschülerleistungen, auf die Berichterstattung der Endbewertung, auf die statistische Erläuterung der verzeichneten Dateien und auf die Bewertungsproben.

SCHLÜSSELWÖRTER UND SCHLÜSSELSYNTAGMEN: Vorschule, Bewertungsproben, vorzeitige Erziehung, Item, Leistungsdarstellung.

Today, lowering the age for the start of preschool education has become a main concern so that age like 4 or 2 are often suggested for this beginning. Research shows that this is not a mere pedagogical experiment or a daring attempt, or a change in the age or development psychology, but rather a stringent need to transfer the child from the maternal care and observation (sometimes suffocating the child) to the organised and specialised care of the daily time, of the play and for the inclusion of the child in a well articulated program required by early education.

It is for this reason that parents still question this issue:

- Should my child go to the kindergarten?
- How many years should the child stay in kindergarten?
- Shouldn't it be better for the child to stay with the grandparents?
- Shouldn't it be better for the child with a baby-sitter?!...

Almost any parent (or at least mother) is confronted with such problems and it is this reason for which we try to give them an answer in the spirit of the theories concerning early education:

- Yes, the child should be taken as confidently to the kindergarten as possible!

□ Grandparents and teachers in kindergartens do not do the same thing. *Age, daily concern, varied means to organise the ludic space show that the two categories do not bear the same significance.*

□ The child spends a time totally and exclusively dedicated to him/her in the kindergarten.

□ Generically speaking, teachers and "baby-sitters" also do not mean the same. *To list in a pair such differences may seem redundant.*

However, in order to meet the early coming to school of the child, we propose that the teachers should learn and observe a dictionary for this age, called GRĂDI FAN, as follows:

A HELP children not to be afraid to walk in the kindergarten and room dedicated to them;

PROVIDE customised educational programmes to them;

B ENJOY any moment of calmness together with the preschoolers and parents;

C CREATE attractive ludic situations in the kindergarten and outside it;

D DISCUSS any problem of concern with the child, get closer to them gently;

DEVELOP an early personal autonomy;

E ELABORATE as varied as possible strategies to diminish fear and infantile aggressiveness;

F PROTECT your child from any form of aggressiveness;

G BE QUICK in telling the child when making progress;

H CLAMOUR every minor success of the child;

I LOVE the activity and children as you love yourself;

INITIATE remedial and compensating therapies at the right time and place;

Î MAINTAIN a real and constructive partnership with the preschoolers' parents.

Thus, from help (A) to love (I), through attachment and capitalisation of empathy virtues, we will (surely!) meet an early generation wishing to have novel things around, THE NOVELTY of the kindergarten. The institution will add to the education in the family in the proper manner also by passing through the rest of the letter of the dictionary proposed:

J PLAY with the preschoolers and valorise additionally the ludic actions they propose or make;

L CLEAR any problem-situation in due time;

M CARESS the child in words and deeds, equally!

N LEAVE ASIDE your personal problems, to find yourself back in childhood;

O AVOID negativistic behavioural reactions;

P PROPOSE varied activities to the preschooler;

PROMOTE teamwork;

R ANSWER the children's questions, though you may repeat yourself;

COUNSEL their parents;

S STIMULATE permanently the child personality development process;

T TREAT individual and age particularities properly;

U FORGET BAD continuously to build for GOOD (together with the child);
V DREAM together and at once with each child;
Z STOP for a longer time on the dictionary GRĂDI FAN, implement it and tell the others about its results.

The implementation of the dictionary called GRĂDI FAN requires teaching skills, availability and time.

Besides the dictionary, mention should be made that one should not neglect the assessment procedures in place through teaching filed practice.

This is their specific at level I, 2/3 – 5 years:

1. Educating language

Description of initial evaluation items (EI):

- 1.1.a. Knows to tell correctly his-her name
- 1.1.b. Make correct simple and developed sentences
- 1.1.c. Names objects, images with proper words

Description of continuous evaluation items (EC):

- 1.2.a. Answers and forms questions
- 1.2.b. Uses singular and plural forms correctly
- 1.2.c. Reproduces a short story, poem
- 1.2.d. Indicates writing in a book, newspaper, magazine

Description of final evaluation items (EF):

- 1.3.a. Uses correctly the verb tenses, describes images related to actions
- 1.3.b. Uses new words in proper contexts
- 1.3.c. Recognises characters in known texts
- 1.3.d. Recites poems, with proper intonation, breaks

2. Mathematical activities

Description of initial evaluation items (EI):

- 2.1.a. Sorts objects according to size
- 2.1.b. Selects circles, triangles, squares (red, yellow, blue), and arranges them in groups
- 2.1.c. Recognises and names position in space
- 2.1.d. Forms groups of 1, 2 or 3 objects

Description of continuous evaluation items (EC):

- 2.2.a. Sorts objects according to size, form, colour
- 2.2.b. Orders objects according to size, length, thickness
- 2.2.c. Chooses shown geometrical forms
- 2.2.d. Places objects in a given space

Description of final evaluation items (EF):

- 2.3.a. Appreciates quantity globally
- 2.3.b. Counts and tells how many objects are in the concentre 1 – 5
- 2.3.c. Recognises the neighbours of the numbers in the concentre 1 – 5
- 2.3.d. Relates figure to object
- 2.3.e. Selects geometrical parts according to a given criterion

3. Knowledge about the environment

Description of initial evaluation items (EI):

- 3.1.a. Recognises the classroom and other rooms in the kindergarten
- 3.1.b. Recognises basic colours
- 3.1.c. Enumerates some clothes
- 3.1.d. Identifies day parts (day, night)

Description of continuous evaluation items (EC):

- 3.2.a. Selects images related to life in the kindergarten
- 3.2.b. Describes the features of seasons
- 3.2.c. Encircles fruit and vegetables typical of seasons
- 3.2.d. Describes clothes

Description of final evaluation items (EF):

- 3.3.a. Enumerates some furniture and plates and dishes
- 3.3.b. Removes images not proper to a season
- 3.3.c. Names wild and domestic animals correctly
- 3.3.d. Selects images related to transportation means

4. Society-related education

Description of initial evaluation items (EI):

- 4.1.a. greets when coming and leaving
- 4.1.b. plays alone and/or with other children
- 4.1.c. Names the city we live in
- 4.1.d. Sites the places of the kindergarten

Description of continuous evaluation items (EC):

- 4.2.a. Knows personal hygiene rules
- 4.2.b. Appreciates a positive/negative behaviour
- 4.2.c. Participates in joint activities
- 4.2.d. Colours the national flag well

Description of final evaluation items (EF):

- 4.3.a. Introduces himself/herself, speaks about himself/herself
- 4.3.b. Knows and uses road traffic rules
- 4.3.c. Gets dressed, undressed and eats alone
- 4.3.d. Tells the difference between lie and truth
- 4.3.e. Tells a prayer

5. Practical activities

Description of initial evaluation items (EI):

- 5.1.a. Tears and crumples
- 5.1.b. Folds paper in two
- 5.1.c. Collects, arranges things

Description of continuous evaluation items (EC):

- 5.2.a. Strings
- 5.2.b. Glues, if given a model

5.2.c. Sorts materials

Description of final evaluation items (EF):

5.3.a. Sticks a cord to an outline

5.3.b. Glues freely or according to a pattern

6. Musical education

Description of initial evaluation items (EI):

6.1.a. Reproduces a fragment from a song

6.1.b. Shows by gestures the height of sounds

Description of continuous evaluation items (EC):

6.2.a. Reproduces learnt songs

6.2.b. Recognises the songs from a tune fragment

6.2.c. Slaps hands or walks with the tune

Description of final evaluation items (EF):

6.3.a. Reproduces learnt songs

6.3.b. Perceives the heights of sounds

6.3.c. Beats the rhythm

7. Artistic education

Description of initial evaluation items (EI):

7.1.a. Keeps pencil, pen, brush correctly in hand

7.1.b. Draws lines, points, scribbles

7.1.c. Colours a given area

Description of continuous evaluation items (EC):

7.2.a. Colours a given space

7.2.b. Models

7.2.c. Fingerpaints, paints

Description of final evaluation items (EF):

7.3.a. Fills in colour, following contour and colours

7.3.b. Models

7.3.c. Fingerpaints, paints

8. Physical education

Description of initial evaluation items (EI):

8.1.a. Runs in a given sense

8.1.b. Moves various segments of the body

Description of continuous evaluation items (EC):

8.2.a. Answers to specific orders

8.2.b. Walks and runs exercises

Description of final evaluation items (EF):

8.3.a. Varies of walks and runs

8.3.b. Runs to a landmark

8.3.c. Keeps balance along a line

8.3.d. Jumps

To follow the meeting of specifications for all performance descriptors and to more clearly differentiate the manifest and developing behaviours, one can use the following table to record preschooler data:

<i>No.</i>	<i>Preschooler name and surname</i>	<i>Type of activity</i>	<i>EI</i>	<i>Score</i>	<i>EC</i>	<i>Score</i>	<i>EF</i>	<i>Score</i>
1	B. A.	Language education	1.1.a. 1.1.b. 1.1.c.	FB FB FB	1.2.a. 1.2.b. 1.2.c. 1.2.d.	FB FB FB FB	1.3.a. 1.3.b. 1.3.c. 1.3.d.	FB FB FB FB
	...							

The data collected as above helps the teacher write a global evaluation report at the end of the school year as follows:

REPORT

Of final evaluation of the children in the small group, level I

In June ..., we performed the summative evaluation (final) for the small group, where from the total number of enrolled children, ... children were evaluated.

Knowledge in all domains was tested, by oral tests, graphical/written and practical tests. Each category had its own items and performance descriptors.

At the end of the evaluation, the following results were found:

<i>Domain</i>	<i>Items</i>	<i>FB</i>	<i>B</i>	<i>S</i>	<i>I</i>
Educating language	1.3.a. Uses correctly the verb tenses, describes images related to actions 1.3.b. Uses new words in proper contexts 1.3.c. Recognises characters in known texts 1.3.d. Recites poems, with proper intonation, breaks				
Mathematical activities	2.3.a. Appreciates quantity globally 2.3.b. Counts and tells how many objects are in the concentre 1 – 5 2.3.c. Recognises the neighbours of the numbers in the concentre 1 – 5 2.3.d. Relates figure to object 2.3.e. Selects geometrical parts according to a given criterion				
Knowledge about the environment	3.3.a. Enumerates some furniture and plates and dishes 3.3.b. Removes images not proper to a season				

EARLY MONITORING OF THE PERFORMANCE OF THE YOUNGEST PRESCHOOLERS

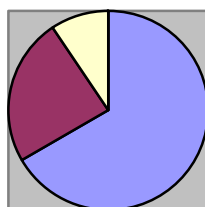
<i>Domain</i>	<i>Items</i>	<i>FB</i>	<i>B</i>	<i>S</i>	<i>I</i>
	3.3.c. Names wild and domestic animals correctly 3.3.d. Selects images related to transportation means				
Society-related education	4.3.a. Introduces himself/herself, speaks about himself/herself 4.3.b. Knows and uses road traffic rules 4.3.c. Gets dressed, undressed and eats alone 4.3.d. Tells the difference between lie and truth 4.3.e. Tells a prayer				
Practical activities	5.3.a. Sticks a cord to an outline 5.3.b. Glues freely or according to a pattern				
Musical education	6.3.a. Reproduces learnt songs 6.3.b. Perceives the heights of sounds 6.3.c. Beats the rhythm				
Artistic education	7.3.a. Fills in colour, following contour and colours 7.3.b. Models 7.3.c. Fingerpaints, paints				
Physical education	8.3.a. Varies walks and runs 8.3.b. Runs to a landmark 8.3.c. Keeps balance along a line 8.3.d. Jumps				
Total:					

The numerical, percentage recordings can be completed with ampler statistical analyses, including histograms, frequency diagrams or any other data processing supports used by the teacher.

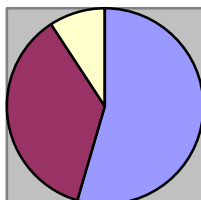
Here is such an example:

Graphical representation of the final evaluation report 2006-2007 as per domains of activity Level I

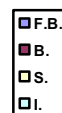
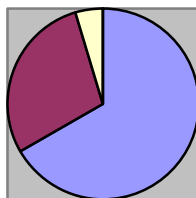
Education language



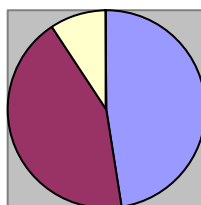
Mathematical education



Knowledge about the environment



Society-related education



Of special significance are the oral tests, graphical or written tests and practical tests including evaluation tasks.

For the beginner teachers as well as for the teachers that already have some experience, we provide some examples, divided per domains of activity, performance descriptors and items:

1. Educating language

a. Uses correctly the verb tenses, describes images related to actions

Game: What does the child? (the child plays, draws, dresses, washes hands, eats).

b. Uses new words in proper contexts: weak, swallow, nest

c. Recognises characters in known texts: Red Hood in the fairytale written by Ch. Perrault, the cock in „Two pence purse”, by I. Creangă.

Game: „Guess, who is there?”

d. Recites poems, with proper intonation, breaks: „My little tree”, by M. Micu

2. Mathematical activities

a. Appreciates quantity globally: Where are there more cherries? Where are there fewer cherries?

b. Counts and tells how many objects are in the concentre 1 – 5: How many cherries are there?

c. Recognises the neighbours of the numbers in the concentre 1 – 5: Which figure is placed before 5? What about before 2?

d. Relates figure to object: Each fisherman has an angle. Draw a line from the fish to the angle in which it is caught

e. Selects geometrical parts according to a given criterion: Choose the small/yellow/thick square (Math Game LOGI II)

3. Knowledge about the environment

a. Enumerates some furniture and plates and dishes

Game: „Where did the wheel stop?” (to name some plates, dishes and furniture items)

b. Removes images not proper to a season: Cuts by lines what is not proper to the summer season

c. Names wild and domestic animals correctly: dog, cat, cow, goat, pig, hen, cock, bear, fox, wolf

d. Selects images related to transportation means: car, bicycle, train, plane, boat

4. Society-related education

a. Introduces himself/herself, speaks about himself/herself: My name is..., I am..., I am from group...

Game: Who am I?

b. Knows and uses road traffic rules: traffic light colours, pedestrians crossing

c. Gets dressed, undressed and eats alone: personal hygiene abilities

d. Tells the difference between lies and truth: How did the bunnies behave? (Comparative analysis of the text „the two bunnies: White Puff and Grey Puff”, folk story)

e. Tells a prayer: „Angel”

5. Practical activities

a. Sticks a cord to an outline: Wild animals on an outline/board

b. *Glues freely or according to a pattern*: Summer fruit/vegetables in an contour

6. *Musical education*

- a. Reproduces learnt songs: „The bird and the child” from Folclorul copiilor, „Animal language ”by D. G. Kiriac
- c. Beats the rhythm: „The bird and the child” from Folclorul copiilor

7. *Artistic education*

- a. Fills in colour, following contour and colours: Little hats
- b. Models: Summer fruit/vegetables
- c. Fingerpaints, paints: The rain. The rainbow

8. *Physical education*

- a. Varies walks and runs: walking and running in circle
- b. Runs to a landmark: Run to the little fence!
- c. Keeps balance along a line: Cross the bridge! Let us walk on the curb of the sandbox!
- d. Jumps: Who jumps farther? Let us jump over the barrier.

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LES STRATEGIES METACOGNITIVES ET LES STRATEGIES L.E.D.P.C

LILIANA CIASCAI*, CRISTINA POP**

ABSTRACT. Dieses Werk bringt die Problematik der Lehre zur Sprache, die auf Bilder ausgerichtet ist, die für alle gLernenden extrem wirksam ist, selbst wenn die Schüler mit einem sichtlichen Lehrstil die Hauptempfänger sind. Im Werk gibt man als Beispiele einige auf Bilder ausgerichtete Lehraktivitäten, man beschreibt einen Bereich graphischer Organisatoren, die im Kindergarten- und beim Primarbereich praktiziert wurden. Außerdem stellt das Werk die auf die Bewertung ausgerichteten Ergebnisse einer Versuchsnachforschung, die für eine große vorbereitende Gruppe verwirklicht wurde, und die erste Klasse, vor die die Bilder integriert.

Fondements

Conformément au projet „La lecture et l’écriture pour le Développement de la Pensée Critique ” penser d’une manière critique signifie „prendre des idées, examiner leurs implications, les asservir au scepticisme constructif, les poser en balance avec d’autres points de vue opposés, bâtir des systèmes d’arguments qui les soutiennent et leur donnent de la consistance et prendre une position ayant comme base ces structures; la pensée critique est un processus complexe d’intégration créative des idées et des ressources, de réconceptualisation et de réintégration des concepts et des informations” (Ogle, 1998 dans Crețu, 2007). La pensée critique est considérée un niveau supérieur de la pensée, documenté sur les connaissances d’une grande valeur et utilité, respectivement sur les convictions et les opinions documentées à ce sujet. Brookfield (apud, Fish, 1995, p. 186) présente une série de stratégies facilitant la pensée critique, que nous présentons, d’une manière adaptée (généralisées):

- acceptation et encouragement de la diversité des convictions et de la divergence des opinions;
- opposition/résistance envers les solutions/les résultats “artificiels”;
- scepticisme vis-à-vis des solutions “finales”;
- flexibilité et spontanéité;
- accepter le risque;
- ouverture/facilitation des analyses critiques;
- refus de chercher une solution expresse/donnée, d’essayer de “démontrer” quelque chose;

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- renoncement au “perfectionnisme”;
- reconnaissance de l’existence des limites de la connaissance humaine;
- réflexion sur les processus et les attitudes auxquelles on se confronte et leur valorisation.

Paul & Elder (2001) établissent les étapes de parcours pour devenir “penseur critique”. En acceptant que de par sa nature, l’homme est un penseur, on peut parler du “penseur qui ne réfléchit pas” à ce qu’il entreprend. La principale caractéristique en est celle de la limitation de leur propre point de vue, fait qui le conduit aux idées préconçues. Le stade suivant est celui du penseur qui accepte “la provocation” parce qu’il reconnaît son ignorance, les préjugés et le besoin d’éduquer sa pensée. Le troisième stade est appelé “du penseur débutant”, celui qui reconnaît non seulement son ignorance et le besoin d’éduquer sa pensée mais, en outre, il est à même d’actionner concrètement dans ce sens. Le penseur “en cours de transformation” est celui qui s’entraîne régulièrement, en réfléchissant à ce qu’il a l’intention de faire, à ce qu’il entreprend et à ce qu’il a réalisé. Le penseur persévérant / tenace en réfléchir est un penseur critique “exercé”. Enfin, le dernier stade est celui de “maître” de la pensée, celui pour lequel la pensée (critique) représente “la deuxième nature”.

Tableau 1.

Étapes vers le développement de la pensée critique (Paul & Elder, 2001)

↑	Penseur „maître”
	Penseur exercé
	Penseur débutant
	Penseur qui accepte la provocation
	Penseur „qui ne réfléchit pas”

Les stratégies L.E.D.P.C et les stratégies métacognitives

Les stratégies L.E.D.P.C

Le cadre Évocation – Réalisation du sens – Réflexion (ERR) représente une modalité de concevoir, d’organiser et de réaliser l’enseignement – l’apprentissage qui débute par les connaissances acquises déjà par les élèves concernant un certain sujet et qui fait appel à l’analyse et à l’évaluation des opinions et des solutions possibles pour conférer une signification aux notions apprises et afin d’en stimuler la réflexion critique. Celle-ci repose, selon l’affirmation de Crețu, en partie sur le modèle du Vaughn et d’Estes, modifié et élargi par Meredith et Steele (1997).

Dumitru (2000, p. 64) souligne un aspect important, souvent omis, et notamment:

Le cadre ERR ne suppose pas un mouvement linéaire de type évocation-compréhension-réflexion, mais plutôt un mouvement circulaire ou en forme de spirale: une certaine évocation conduit à une certaine compréhension des connaissances

et à certaines réflexions. À son tour, la réflexion produit de nouvelles évocations et de nouvelles modalités de compréhension des choses, de réalisation du sens et de compréhension de leur signification.

Le schéma suivant, qui modèle une situation d'apprentissage axée sur le modèle constructiviste (adapté d'après Valanides et Angeli, 2001, p. 158), peut illustrer l'idée ci – dessous mentionnée:

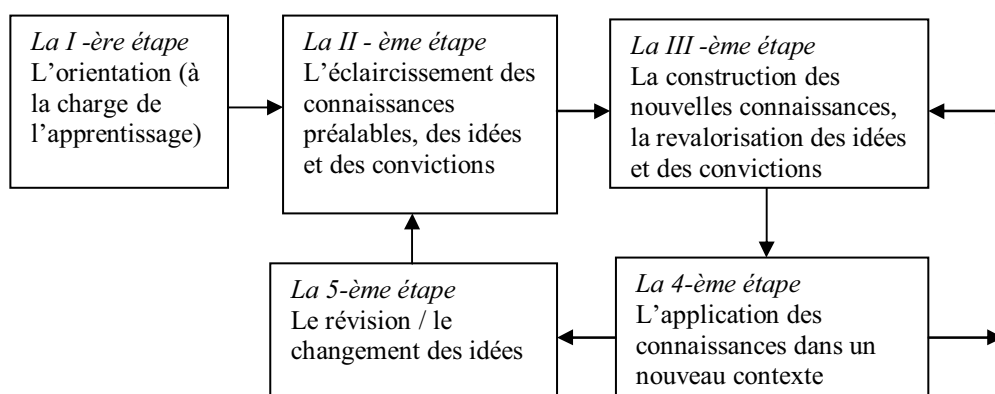


Figure 1. Le modèle constructiviste de la situation d'apprentissage

En analysant ce modèle on peut constater que les étapes I-ère et II-ème du schéma ci-dessous peuvent être encadrées dans la séquence *Évocation* du cadre ERR. Celle-ci suppose l'information des élèves concernant le contenu de la charge d'apprentissage et puis, l'explication des idées et des convictions qui les concernent. La 3-ème et la 4-ème étapes appartiendraient à la séquence *Réalisation du sens* pendant que la dernière étape peut être attribuée à l'étape *Réflexion*.

C'est pourquoi, basées sur la psychologie constructiviste, les stratégies L.E.D.P.G.C sollicitent l'implication réelle des élèves dans la redécouverte des connaissances, dans les conditions de la prise en considération des caractéristiques du développement de leur pensée ainsi que de leurs besoins et intérêts. Dans la structure des stratégies on prend en considération les méthodes et les techniques d'apprentissage par collaboration. Dans le plan de la projection didactique, l'application du cadre ERR et l'utilisation des stratégies impliquent la repensée des contenus/des compétences qui veulent être assimilées par les élèves et une activité d'apprentissage qui se réalise souvent au surplus des buts préétablis.

Dans le prochain tableau on présente les activités qui, dans la conception de l'auteur de cet ouvrage, sont recommandées à être réalisées par les élèves dans le contexte de l'utilisation des stratégies L.E.D.P.C.

Tableau 2.

Activités recommandées à être sollicitées aux élèves dans le contexte d'application du cadre ERR

Étape	Activités réalisées par les élèves
Évocation	<p>Les élèves seront encouragés, individuellement ou en groupe, à :</p> <ul style="list-style-type: none"> - exposer leurs connaissances (déclaratives, procédurales, attitudinales) concernant le contenu scientifique qui fait l'objet du nouvel apprentissage; - fixer / choisir un objectif personnel concernant la nouvelle situation d'apprentissage et le justifier; - anticiper un résultat (prédiction), imaginer une solution, formuler un problème, projeter un mode de travail et justifier leurs propositions; - organiser leur apprentissage, en prenant en compte leur expérience personnelle antérieure;
La réalisation du sens	<p>Les élèves seront sollicités, individuellement ou en groupe à :</p> <ul style="list-style-type: none"> - confronter / comparer leurs réponses, les textes rédigés avec ceux des collègues; - compléter les réponses, les textes et ensuite les vérifier et les avec ceux des collègues; - trouver des erreurs dans les documents réalisés par les collègues ou obtenus par diverses sources; - valoriser les aspects positifs constatés concernant les productions personnelles ou celles de leurs collègues; - rédiger les problèmes ou les questions ayant comme point de départ des résolutions ou des réponses; - résoudre un problème, rédiger un texte, projeter une démarche (expérimentale) ou réaliser ces activités "en estafette"; - comparer les énoncés des problèmes, questions, hypothèses du travail; - expliquer/justifier une solution/une réponse donnée, une manière de travail théorique ou expérimentale, un produit concret, appartenant à d'autres collègues/d'autres personnes; - résumer dans une phrase ou deux ce qu'ils viennent d'apprendre; - anticiper la note à la vérification/activité/examen, en justifiant l'appréciation; - écrire des mots-clés pour un texte ou une leçon; - débattre/discuter avec leurs collègues la solution d'un problème, la modalité de réalisation d'une activité expérimentale, des constatations ou des conclusions expérimentales; - donner des exemples;
La réflexion	<p>Les élèves seront conseillés à :</p> <ul style="list-style-type: none"> - réfléchir (ce qu'ils ont appris, ce qui leur a semblé utile ou nécessaire par rapport à ce qu'ils ont appris, à ce qu'ils ont senti etc.); - faire le bilan de ce qu'ils ont appris, en s'orientant d'après les questions proposées par les professeurs ou les collègues - faire le bilan du processus d'apprentissage en utilisant les questions proposées par le professeur; - comparer (des points de vue qualitatif et quantitatif) les connaissances antérieures avec les nouvelles connaissances assimilées; - compléter un journal avec des réflexions.

Stratégies métacognitives

Le concept de “métacognition” connaît de multiples définitions. Un premier essai de définition est attribué à la psychologie cognitive et il fait référence aux “*connaissances que le sujet a sur le fonctionnement de son propre système cognitif*” (Miclea, 1999, p. 323) et la *modalité grâce à laquelle il peut en devenir conscient*. Dans une acception pareille, la métacognition est étroitement liée à des représentations sémantiques, à leur construction (par règles algorithmiques ou euristiques), à leur valeur sémantique.

La deuxième définition de la métacognition concerne les mécanismes de réglage et le contrôle du fonctionnement cognitif: planification, prévision, guidage et contrôle, transfert et généralisation. Ces activités permettent l’orientation et le réglage de l’apprentissage et du fonctionnement cognitif en situations de résoudre des problèmes. Elle est promue aujourd’hui dans l’éducation par des psychopédagogues connus (Meireu, 1989, p. 87; Giry, 1994, p. 21; Barth, 1996, p. 51), préoccupés par la formation et le développement des compétences métacognitives des élèves.

Comparativement aux les activités nécessaires à être systématiquement sollicitées aux élèves dans le contexte d’application du cadre ERR, l’utilisation des stratégies métacognitives suppose, en outre:

Tableau 3.

Interventions métacognitives dans la réalisation d’une tâche d’apprentissage

Étape	Activités réalisées par les élèves
Avant le nouvel apprentissage	Les élèves seront encouragés, individuellement ou en groupe à : <ul style="list-style-type: none"> ○ essayer d’évaluer le niveau de leurs connaissances concernant le thème/le contenu scientifique qui fait l’objet du nouvel apprentissage; ○ rappeler et évaluer les difficultés rencontrées dans la résolution des tâches d’apprentissage semblables; ○ essayer d’anticiper les difficultés qu’ils peuvent rencontrer dans la résolution de la nouvelle tâche d’apprentissage; ○ identifier et évaluer les capacités, les compétences, le savoir-faire dont on a besoin pour la résolution de la nouvelle tâche d’apprentissage;

Étape	Activités réalisées par les élèves
Pendant l'apprentissage des nouvelles connaissances	<p>Les élèves seront sollicités, individuellement ou en groupe à:</p> <ul style="list-style-type: none"> ○ confronter /comparer les expériences réalisées ou les procédures appliquées avec celles des collègues; ○ trouver des erreurs dans leurs propres procédures de travail (expérimentales ou non expérimentales) ou dans celles réalisées ou proposées par leurs collègues; ○ anticiper leur note suite à la vérification /épreuve/ examen, en justifiant leur appréciation par référence non seulement aux résultats, mais aussi aux procédures appliquées; ○ débattre/discuter avec leurs collègues la solution d'un problème, la manière de réaliser une activité expérimentale, constatations ou conclusions expérimentales etc. ○ utiliser IMMÉDIATEMENT les connaissances en d'autres situations concrètes;
Après l'apprentissage des nouvelles connaissances	<p>Les élèves seront conseillés à:</p> <ul style="list-style-type: none"> ○ réfléchir (ce qu'ils apprennent, ce qui leur a paru difficile, ce qu'ils croient que c'est important de revoir, ce qu'ils doivent corriger, ce qu'ils étudient encore, ce qui leur a paru utile ou nécessaire par rapport à ce qu'ils ont appris, à ce qu'ils ont senti); ○ autoévaluer (s'ils considèrent qu'ils progressent alors comment ils envisageraient ce progrès etc.); ○ faire le bilan de ce qu'ils ont appris, non seulement en termes de résultats, mais aussi par référence à la réussite des procédures de travail appliquées; ○ comparer (qualitativement et quantitativement) les connaissances antérieures avec de nouvelles connaissances assimilées en réalisant la comparaison non seulement en termes de résultats, mais aussi par référence; ○ à la réussite des procédures de travail appliquées; ○ indiquer les modalités d'enrichissement des connaissances.

Pour la démonstration à l'aide des exemples on présente une fiche d'activité expérimentale, commentée d'une manière critique:

Tableau 4.

Illustration des interventions métacognitives dans une activité expérimentale

Interventions préliminaires d'une action	Fiche d'activité expérimentale	Intervention de réglage et d'autoévaluation des actions
<p>Étudier avec attention le contenu de la fiche. Selon ton opinion, quelles connaissances devrait-on réactualiser afin de pouvoir prédire ce qu'il se</p>	<p>Thème : L'expérience de DESCARTES Dispositif expérimental: - mesure (avec une longueur de 50 cm); - récipient avec de l'eau; - membrane élastique (confectionnée d'un ballon);</p>	<p>Avec quels autres composants pourras-tu réaliser le dispositif expérimental? Quelles recommandations concernant le mode du</p>

Interventions préliminaires d'une action	Fiche d'activité expérimentale	Intervention de réglage et d'autoévaluation des actions
<p>passera à la suite ou pour expliquer les constatations? Pourquoi, par hasard, la colonne d'eau doit-elle avoir la valeur indiquée? Qu'est-ce que l'on croit qu'il arrive à la pression de la membrane Mais à la cessation de l'action sur elle? Motiver la réponse.</p>	<p>- règle graduée; - éprouvette (de 12 cm longueur). Mode du travail: - remplir le récipient avec de l'eau pour que la colonne d'eau arrive jusqu'au bord; - remplir l'éprouvette avec de l'eau, par conséquent, la colonne d'eau aura approximativement 8,5 cm; - renverser rapidement l'éprouvette dans le récipient afin que l'eau ne coule pas; - appliquer sur le bord du récipient une membrane élastique bien tendue; - presser la membrane de la main et observer le comportement de l'éprouvette; - cesser l'action sur la membrane; Constatations:..... Expliquer les constatations (formuler l'explication en mots et décrire mathématiquement les processus qui se produisent); Conclusion:</p>	<p>travail donneras-tu à quelqu'un qui voudrait faire cette expérience? Évaluer l'activité expérimentale prenant en considération les aspects suivants: - la correction des opérations réalisées; - la réussite de l'expérience; - la correction des explications formulées. Quelles situations réelles (et dans quelles limites) modèlent-elles l'expérience de Descartes? Comparer ton explication avec celle de tes collègues? Thème: À partir des données de l'expérience composer un problème.</p>

L'anticipation des difficultés: le vidage complet de l'éprouvette au renversement, à cause du manque de l'habileté de celui qui réalise l'expérience;

L'explication de la recommandation suivante: après le renversement de l'éprouvette au bord du récipient, il serait bon d'exister une couche d'air de sorte que la pression de cette membrane ne vienne pas en contact avec l'éprouvette ou l'eau;

L'imagination d'autres variantes constructives, en ayant comme composants l'eau et:

- l'éprouvette, récipient pour essences d'usage culinaire (sans bouchon), membrane de ballon;
- bouteille de lait, éprouvette, membrane de ballon;
- pot et poupée de plastique reliée d'une balle de tennis de table perforé en trois points avec une aiguille rouge au feu, membrane de ballon;
- flacon de plastique de 0.5 l, fermé avec le couvercle, un couvercle transparent de stylo ou un récipient pour essence (sans bouchon).

La réalisation des analogies avec des faits scientifiques cueillis de la réalité vivante : la vessie avec de l'air des poissons, la cloche d'air.

La composition/la solution d'un problème: Un tube de verre fermé au bout, de longueur $l = 50$ cm et avec la section transversale d'aire $S = 0,5$ cm² est introduit dans l'eau. Le poids du tube est $G = 15 \cdot 10^{-2}$ N. Déterminer la force qu'il doit appliquer pour maintenir le tube sous l'eau, si la distance du bout fermé du tube à la surface de l'eau est $h = 10$ cm, $p_0 = 10^5$ N/m².

Les stratégies L.E.D.P.C

Le cadre Évocation – Réalisation du sens – Réflexion (ERR) représente une manière de concevoir, d'organiser et de réaliser l'enseignement – l'apprentissage qui a comme point de départ les connaissances acquises par les élèves concernant un certain sujet, il fait recours à l'analyse et l'évaluation des opinions et des solutions possibles pour conférer une signification aux notions apprises et pour en stimuler la réflexion critique.

Le cadre ERR ne suppose pas un mouvement linéaire du type évocation – compréhension – réflexion, mais plutôt un mouvement circulaire ou en forme de spirale: une certaine évocation conduit à une certaine compréhension des connaissances et aux certaines réflexions réalisées sur ce thème. À son tour, la réflexion engendre de nouvelles évocations et de nouvelles modalités de compréhension des choses, de réalisation du sens et de compréhension de leur signification (Dumitru, 2000, p. 64).

Conclusions:

a) similitudes et différences entre les stratégies métacognitives et les stratégies L.E.D.P.C. Les deux types de stratégies:

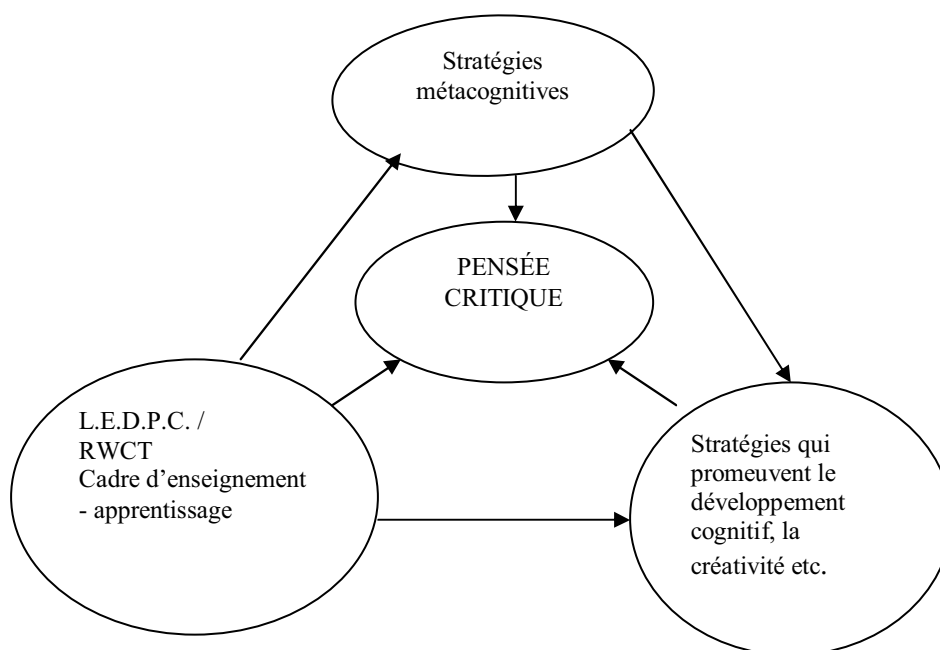
- contribuent au développement de la pensée critique;
- nécessitent du temps et de l'étude pour conduire à un apprentissage de succès;
- bénéficient des valences du travail en groupe;
- les stratégies L.E.D.P.C. utilisent fréquemment le travail en groupe pendant que les stratégies métacognitives ne nécessitent pas obligatoirement le travail en groupe;
- le professeur joue le rôle de chef d'orchestre/modérateur quand il accède aux stratégies L.E.D.P.C. et le rôle d'entraîneur en cas d'utilisation des stratégies métacognitives (si on fait référence aux mécanismes d'application des informations);
- l'autoévaluation a de l'importance et une qualité supérieure dans un cadre d'apprentissage basé sur les stratégies métacognitives;
- les stratégies L.E.D.P.C. sont relativement faciles à utiliser par des élèves ayant des âges scolaires d'enfants pour l'école primaire pendant que les stratégies métacognitives se prêtent mieux aux âges d'adolescents;

- les stratégies L.E.D.P.C. peuvent faire l'objet d'un apprentissage implicite pendant que dans l'utilisation des stratégies métacognitives l'apprentissage explicite joue un rôle plus important;

-

b) Comme on peut constater dans l'analyse des contenus des tableaux 2 et 3, l'accoutumance des élèves aux stratégies L.E.D.P.C. facilite l'assimilation des stratégies métacognitives.

Le système des interrelations entre les catégories de stratégies ci-dessus mentionnées ainsi que leur apport au développement de la pensée critique peut être illustré par le schéma suivant:



Les développements possibles du thème:

- Les contributions L.E.D.P.C. au développement de la créativité des élèves;
- Les contributions L.E.D.P.C. à la formation du penseur (à voir "les étapes de la pensée critique") etc.

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COLLABORATIVE LEARNING: THE SAME CONCEPT ON BOTH SIDES OF THE ATLANTIC?

RAY COOKE*, ALAIN BAUDRIT**

ZUSAMMENFASSUNG. Das Konzept des kooperativen Lernens bleibt weiterhin definiert zu werden. Zwei Hauptformen von es sind auf beiden Seiten vom Atlantik einflussreich geworden: Die Genf-Schule, wie von Piaget Abriß gegeben und die amerikanische Schule spornten durch Vygotsky an. Dieser Artikel hebt diese zwei Formen durch die Studie der Doppelreihenfolgen hervor, in denen Pupillen mit einer verhältnismäßig neuen erlernensituation gegenübergestellt werden. Schließlich stellt er etwas Ähnlichkeiten zwischen den zwei Ansätze her.

SCHLÜSSEL: kollaboratives Lernen; unvereinbare Zusammenarbeit; konstruktive Zusammenarbeit; kooperative Untersuchung; Lernen in der Schule

While there are several definitions of cooperative learning (COOP), collaborative learning (COLL) still lacks clarification (Baudrit, 2007a). COOP is considered by Johnson & Johnson (1990) as small-group work where a common goal allows participants to optimize their learning. The idea is that collective activity directed towards a shared objective can be used profitably by all the members of the group in their quest for learning. However, the question remains as to what drives this phenomenon. Johnson & Johnson, when talking about the school context, say that pupils may attain their objectives only if the other pupils with whom they are cooperatively associated attain theirs (Johnson & Johnson, 1980, p. 94). Individual learning trajectories would therefore seem to depend on work conducted in common, and on the coordination of actions undertaken by the participants in order to perform the common project. Briefly, the notion of interdependence is essential, with each participant benefiting from the collective activity providing that fairly close reciprocal relations exist within the group. Are the same principles of collective actions found in COLL?

What is collaborative learning?

Dillenbourg considers that, for a situation to be collaborative, it must involve individuals who a) are more or less of the same level and can produce the same actions, b) have a common goal, and c) are working together (1999, p. 9). Another aspect is symmetry, since members of collaborative groups are expected to participate to the same degree in the collective action, and that they should be of similar social status. In other

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words, they should consider themselves as peers. Furthermore, there should interaction in this sort of situation because it is supposed to allow participants to speak when they wish and to communicate permanently. The notion has hence arisen of a “learning space” that allows every member to provide arguments, justify his/her point of view, in order to try to be convincing (*ibid.*, p. 13). Finally, Dillenbourg points to cognitive processes involving interplay between individual and collective thought within the framework of collaborative groups. For example, while participants may have their own representations of the problem to be solved, they have to take the others’ opinions into account in order for the group to be able to move towards the common goal. Moreover, this aspect is highlighted by Roschelle & Teasley (1995, p. 70) who see collaboration as a coordinated synchronized activity resulting from an ongoing attempt to construct and uphold a shared perception of a problem.

Participants in collaborative groups may therefore continually compare their own ideas and cognitive activity with those of their partners in a sort of intellectual gymnastics consisting in making inferences about the mental states of others, or reading in the minds of others (Bruner, 1995, p. 76). Such thought processes are reminiscent of the notions of intersubjectivity and mutual comprehension described by other authors (Rommetveit, 1979; Trevarthen, 1980; Forman, 1992; Azmitia, 1996). In fact, for several individuals to solve a problem together and complete a common project, they should all be aware of what each other is thinking, so that they may coordinate their activity and work together. If not, then each member of the group sees things his/her own way and it becomes impossible to work together or solve a problem. A common ground therefore has to be found, an area referred to by Clark & Wilkes-Gibbs (1986) as “grounding”. The theory of grounding posits that an agreement becomes possible between group members from the moment each person is taking part in the collective activity takes the trouble to listen to the others and to understand their point of view. This type of collaborative effort has been likened to the process of reparation (Baker, Hansen, Joiner & Traum, 1999). Reparation occurs whenever group members are frank about their differences of opinion. On the other hand: “This ability to talk about objects that do not have a completely shared meaning is not a problem, but, in fact, an advantage (...). In order to untangle differences in understanding, participants are forced to make their assumptions explicit, to argue, to reason about and to exemplify them” (*ibid.*, p. 42). This is quite far removed from what participants may expect in COOP. The interaction between individual and collective thought is to COLL what the interdependence of productions between group members is in COOP, a distinction that has recently been analyzed in depth elsewhere (Baudrit, 2007b).

Even so, COLL is not necessarily monolithic in nature. At least two variants have been reported.

Collaborative learning: two major schools of thought

Damon & Phelps (1989) identified two types of collaboration arising from quite separate schools of thought. Contradictory collaboration is founded in the Geneva School, while constructive collaboration has its roots in American psychology and its Vygotskian grounding. We shall examine their characteristics and differences.

Contradictory collaboration is based on “a clash of ideas that triggers a need to reexamine, rework, and justify one’s understanding of the world” (Damon & Phelps, 1989, p. 143). In this view, being confronted by a point of view different from one’s own leads to an intrasubjective process (what Piaget would term cognitive conflict), which makes the individual reconsider his/her own state of knowledge. The new knowledge thus produced reflects a process of internal reflection, or a process of internal reasoning in the child. Several authors have examined this aspect of Piagetian thought with its greater emphasis on the consequences of disagreement on the intellectual development of the child than on how such difficulties may be overcome collectively (Bearison, Magzamen & Filardo, 1986; Damon & Phelps, 1987; Azmitia, 1988; Tudge & Rogoff, 1989). This point of view leaves little scope for external factors, especially social factors and the influence of others (Brossard et Fijalkow, 1998, p. 18). Even so, Piaget’s disciples do place greater emphasis on external factors in their development of the notion of socio-cognitive conflict (Perret-Clermont, 1979; Doise et Mugny, 1981). Social interactions of this type oblige the individual to coordinate his/her actions with those of others and lead him/her into a cessation of concentration that in turn leads him to confront his/her point of view with that of his/her partners (Perret-Clermont, 1979, p. 136). Nevertheless, the points of view of the participants will evolve only with time, as their verbal exchanges ensue, which makes them permanently think about how their peers are reasoning (Berkowitz & Gibbs, 1985; Kruger & Tomasello, 1986).

The Geneva School, therefore, is characterized by the articulation between the individual and the group and between intra- and intersubjectivity, as shown by the work of Doise (1982, 1983, 1993). However, its influence goes further in the notion of contradictory collaboration. Piaget placed much emphasis on the quality of reasoning, and on any form of behavior likely to educate the critical mind and lead to objectivity and discursive thinking (Piaget, 1969, p. 263). Collective activities and group situations seem likely to do this, since they help children to see things from a new angle, to learn them more objectively and especially to share ideas about the logic inherent in the tasks they are performing (Damon & Phelps, 1987). Such activities imply not only reflexive thought but also creative activity, since by bringing group members to compare their points of view, they help them to be more innovative and to adopt new solutions as and when they arise during their discussions (Moscovici et Doise, 1992, p. 251). Hence, the contradictory nature of the collaboration lies not in the fact that group members are exchanging their point of view but rather in the sense that they are exchanging divergences, can reconsider a point that they may previously have considered as agreed upon, feel free to adopt a position different from that of the other members or even withhold their opinion until later. In such situations, innovation and discovery may ensue.

The contradictory collaboration developed by the Geneva School therefore seems characterized by the exchange of opposing ideas between partners, which are believed to induce a cognitive disequilibrium leading to the personal reassessment of knowledge and understanding. Personal thought is hence promoted, with a positive impact on how the individual grasps the activity to be performed collectively and

on how that task or exercise is to be completed successfully. A critical point of view may also arise in the minds of the participants, since the contrasting of opposing viewpoints may lead to a fresh outlook on a question or problem.

On the other hand, constructive collaboration takes root in American psychology with its underpinnings of social coordination and “interpsychic regulation” according to Forman (1987). Here the emphasis is on coordinating viewpoints and co-constructing hypotheses in order to achieve a common response (Tudge & Rogoff, 1989, p. 28). In other words, finding the solution to a problem together and combining shared knowledge to do so. Social coordination is favored here with a view to constructing a common goal and avoiding conflict, so that a new unknown domain may be explored (Kruger & Tomasello, 1986). Verbal exchanges between peers are of particular importance because children can learn from such situations and are initiated into new modes of thinking through peer encounters (Damon, 1984, p. 333). The theory of the association between language and thought goes back to Vygotsky (1962) and has been continued by several American thinkers (Bruner, 1985; Wertsch, 1985; Cazden, 1988, Forman & McCormick, 1995).

The influence of Vygotsky is indeed strong because his opinion that manifestations external to collective action, i.e. social coordination, progressively take on an intrasubjective dimension has been relayed by others (McCarhey & McMahon, 1992, p. 18). Bruffee (1984) sees in COLL a means to develop writing activity. Indeed, while individual thought results from interiorized dialogues, writing may be considered as a resurgence of these dialogues. Peer work will be beneficial to this process, as it is in the acquisition of second language writing skills (Storch 2005). The movement is opposite to that described by Piaget and the two notions of learning have been summarized by Nunès (1991, p. 118-119): “The Piagetian child is a solitary learner. The mathematical knowledge he/she gains arises from his/her own thoughts about actions that are really conducted with objects, or that could be conducted (...). From the outset the Vygotskian child uses a system of signs encompassing knowledge systems available in his/her culture (...). They (the signs) are learned and used by children interpersonally”, (personal translation). Interaction between subject and object on the one hand; interaction between subject and subject on the other: learning may be apprehended in these two different ways.

Constructive collaboration therefore emphasizes the social dimension of collaboration since it is favorable to the emergence of verbal exchanges, the association of the knowledge input of peers, and to the coordination of their actions. Damon (2004) talks of co-construction because new solutions are found collaboratively between peers and are then collectively discussed, tried out and modified. Only after that are the complementary roles played by the collaborators interiorized by learners, thus increasing their individual capacity to solve problems (*ibid.*, p. 334).

COLL therefore has distinct forms on both sides of the Atlantic and has been analyzed differently. Table 1 shows the main characteristics of these two conceptions. How can these two approaches be identified at school when pupils are working together? The following extracts throw light on this question.

Two examples of collaboration between pupils at school

Discovery of the notions of verticality and horizontality was investigated in children (mean age: 8.5yr) during an activity consisting in placing numbers on a grid (see annex 1) (Baudrit, 1997). Dyads were formed and were asked to work together. The following is an extract from the first sequence where Marina and Romain try to position the numbers (*ibid*, 1997, p. 121-122).

Silent reading about the exercise to be performed (1). Then...

- Marina: Can you understand what we have to do? (2)
- Romain: No (3)

He then reads the instructions again and gives the following explanation.

- Romain: We have to position the numbers vertically and horizontally. (4)

He uses vertical and horizontal gestures while speaking. (5)

- Marine: For example, that makes 4,507. (6)
- Romain: No, rather 4, 057. (7)

He then hesitates, realizes his mistake (8) and puts 4,507 onto the grid. (9)

Marina then tries to find the next number, which is 2,053. (10)

Meanwhile, Romain places the third number, which is 2,244. (11)

Marine draws attention to the fact that the horizontal and vertical spaces on the grid have been inverted, (12) so she rubs out the numbers that have already been written down. (13)

- Romain: I don't get any of this. (14)
- Marina: Look, the vertical numbers go like this (she gestures when speaking). (15)
- Romain writes again. (16)
- Marina: Do you know what you are doing? (17)
- Romain: I think so. (18)

Marina then explains to him how he has inverted the horizontal and vertical numbers. (19) She proceeds to rub out the mistake.

- Marine: Let's start again. (20)
- Romain: OK. We need to put 4,507 like this (i.e. horizontally). (21)
- Marina: Yes, let's do that. (22)

They place the number 4,507, one writing while the other checks. (23)

In this sequence, the first exchanges involved collective searching (3-4-5-6-7-9) and interventions of a more individual nature (8-10-11). From (12) onwards, the exchanges evolve. Marina realizes her initial error and Romain reiterates it just afterwards (15-16-17). She then helps him to place the numbers (19-20). The most reliable strategy is then discovered together (21-22) and they then implement it in a complementary way (23). The communication is also non-verbal here (5-15). The collective reasoning, mutual assistance and complementarity of roles suggest a

logic of coordination at play between the two. They attempt to solve a problem using their respective knowledge and understanding. “Learning with” seems to be the strategy adopted here, and is different from that chosen by another dyad in the same experiment (Baudrit, 1997, p. 120-121).

Silent reading about the exercise to be performed (1). Then...

- Juliette: You do it vertically and I’ll do it horizontally. (2).

Emmanuelle tries to place 2,503. (3)

She can’t manage it so gives Juliette her pencil (4).

Juliette writes 4,507 (5).

- Emmanuelle: You made a mistake (6).

Emmanuelle grabs hold of the pencil (7) and writes down 2,503 (8).

- Juliette: That’s not right because 2,503 is already written there (9).

• Emmanuelle: If that’s right. (10)

• Juliette: Your writing’s terrible! (11).

Emmanuelle rubs it out and writes again (12).

- Juliette: Let’s do the next number (13).

Emmanuelle writes down 4,731 (14).

• Juliette: Hey, we’ve written vertical what should be horizontal! Let’s correct it now (15).

Emmanuelle puts it right. (16)

Juliette then decides to reposition the vertical numbers (17) but Emmanuelle doesn’t agree (18).

- Juliette: You’ve got it wrong, it should start with a “2” (19).

• Emmanuelle: Stop making me make mistakes, will you! (20)

In this exchange, the pupils start working after deciding who is to do what (1-2). Emmanuelle makes a first unsuccessful attempt (3). Juliette then takes over (4-5) but the first disagreement then occurs (6), then a second (9-10) after they have changed roles (8). Changes are then made (11-12) and the task continues (13-14). Juliette realizes her error (15) and corrections are made (16), but a conflict ensues regarding who has the better strategy (17-19). Emmanuelle then reacts biting (20). The collective searching, divergence of points of view and role permutation all point here to a logic of opposition between the two pupils. Like the first pair, they take turns at solving the problem but there is fundamental disagreement between them. “Learning against” seems therefore to be the strategy at play here.

The two major schools of thought regarding COLL are evident in these exchanges. The first exchange based on a logic of coordination is reminiscent of the constructive collaboration dear to the American School, while the logic of opposition in the second echoes the contradictory collaboration of the European School. That said, are these two forms really distinct, mutually exclusive and without common underpinnings?

Common ground between the two notions of collaborative learning

In both of the abovementioned exchanges, COLL is aimed at helping the learners to increase their knowledge of the world and to present them with situations or problems that are likely to help them to learn something new (Dillenbourg, 1999). However the notions of verticality and horizontality are learned, they pose some form of enigma to the learners, so the latter have to seek a solution collectively in order to complete the task at hand and discover notions that are unfamiliar to them. The idea of a necessary equality in the given task has been underlined on both sides of the Atlantic, so that participants in that task feel equally concerned by it (Piaget, 1932/1992; Damon, 1984; Ligorio, 1997; Dillenbourg, 1999). In fact, it is not easy to identify equality at play, given the extent of latitude left to participants involved in COLL. In the exchanges mentioned here, both participants in each dyad “play the game” by participating in the collective activity, but do they do it equitably and in a balanced way? It would seem that much depends on how they are feeling at the time.

Even so, partners in any COLL situation are *de facto* active. This activity is an essential aspect of a notion common to both Piaget and Vygotsky: that children are active as they develop, and that they acquire knowledge of the world through such activity (Tudge & Rogoff, 1989). In a COLL situation, activity is by nature collective and is oriented towards new, non-basic knowledge, i.e. towards questions that suppose uncertain ambiguous answers (Bruffee, 1995). It is in this respect that the two schools of thought perhaps find their common ground, since the activity involves exploring a more or less unknown knowledge domain and thus reorganizing knowledge or discovering new ideas. So does it matter how such interaction comes about? Do collaboration and contradiction come to have the same outcome? This may be the case if one considers that the most important point is that the exploration should occur conjointly. Perhaps it is the idea of collaborative investigation that brings the two schools of thought together, as evidenced in the wandering dialogues evidenced by Mesnier et Omont (1985) when team members grope around as they try collectively to find a solution to a problem. It may even be that, as the degree of uncertainty inherent in the problem increases, the differences pinpointed on both sides of the Atlantic tend to blur out.

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ANNEX 1

Locate these numbers on the grid

Vertically:

$$(1000 \times 2) + (100 \times 5) + 3$$

$$(1000 \times 4) + (100 \times 7) + (10 \times 3) + 1$$

$$(1000 \times 2) + (100 \times 4) + (10 \times 2) + 4$$

$$(1000 \times 4) + (10 \times 5) + 7$$

Horizontally:

$$(1000 \times 4) + (100 \times 5) + 7$$

$$(1000 \times 2) + (10 \times 5) + 3$$

$$(1000 \times 2) + (100 \times 2) + (10 \times 4) + 4$$

$$(1000 \times 4) + (100 \times 3) + (10 \times 7) + 1$$

	2		
	5		
	0		
	3		

Table 1.

Collaborative learning on both sides of the Atlantic

	American view	European view
Type of collaboration	Constructive collaboration	Contradictory collaboration
Collaborative goal	Find solution(s) to problem(s)	Find logic in task Collective discovery
Interactive activity	Pooling of knowledge Dialogue between peers	Comparing and contrasting opposing points of view
Inter-individual processes	Coordination of perspectives between partners	Collective reasoning and thinking
Intra-individual processes	Appropriation by coordination	Destabilization by opposition
Individual learning	Personal acquisition of knowledge	Individual questioning of knowledge

WINTERSON'S NARRATIVE STRUCTURE AND THE NEW PHYSICS: "GUT SYMMETRIES"

ALINA PREDA

ABSTRACT. Jeanette Winterson's interest in scientific theories and research, which she clearly expresses in "GUT Symmetries", points to the most important tendencies at work today in the field of scientific inquiry. The author's choice of characters, two physicists and a poet, allows for an in-depth analysis of the relationships between different domains of knowledge. Thus, Winterson's fictional universe uncovered in this particular novel may seem, at first, impregnable: in the absence of a minimal background in physics, mathematics, and quantum mechanics the meaning of Winterson's Zen-like maxims cannot be grasped. This grafting of physics and poetry is Winterson's innovative method of linking science and literature, to show that the novel is a genre able to engage the dizzying advance of scientific discoveries of the 20th and 21st centuries.

KEY-WORDS: scientific thought, religious thought, philosophical study, the post-Newtonian age, the post-Euclidean age, Riemannian geometry, Einstein's relativity theory, Heisenberg's uncertainty principle, Superstring Theory, quantum theory, Grand Unified Theories, mathematical fiction

Motto: "The known is finite, the unknown is infinite; intellectually we stand on an islet in the midst of an illimitable ocean of inexplicability. Our business in every generation is to reclaim a little more land."
Thomas H. Huxley

Winterson's *GUT Symmetries* draws the readers into the dizzying whirlpool of scientific theories, love triangles, water symbolism, and inspiring meditations on concepts such as time and space, love and pain, identity and death, science and religion, alchemy and astronomy, reality and narrative, truth, knowledge, memory and history, fact and fiction, linearity, chaos and complexity. In spite of the achronicity of the different accounts, voiced by the three different narrators whose discourses are asymmetrically distributed and unevenly shared (Alice narrates eight and a half chapters, Stella two and a half, and Jove one only), a careful reading process yields some surprising results: a brief history of scientific thought takes shape as soon as the readers manage to put together the scattered pieces of the puzzle.

Ever since the third millennium BC, at the dawn of the first known civilisation in the world, the Sumerian civilisation, people have tried to establish a

link between the religious and the scientific endeavour, which they perceived as the two sides of the same coin. Sumer was a site where arts, crafts, architecture, religious and ethical thought, as well as scientific and technological investigations flourished for almost 1500 years. Aware of the 26,000-year cycle and of the precession of equinoxes, the Sumerians associated the study of the outer world with the study of the spirit. So did the Greeks, for whom philosophy and theoretical science were intertwined:

“In the sixth century BC, the Milesians of Iona deeply concerned themselves with what they called ‘physis’, that is, nature, the nature of things; spirit, man, the observable world, the heavenly bodies.” (GS 10)

Unlike the Greeks, who focused on the theoretical aspect, at the expense of the practical one, the Chinese succeeded in putting scientific discoveries into practice, thus maintaining, for over ten centuries, a level of scientific knowledge unrivalled by the West. Chinese philosophical and religious thought were based on the idea that there is nothing fixed and static, that “everything is flowing, changing, forever being born”, that the world is “a dynamic interplay of energetic forces that are constantly in flux”¹:

“Nothing is solid. Nothing is fixed. These are images that time changes and that change time, just as the sun and the rain play on the surface of things.” (PB 44)

As for Europe, from the year 600 BC onwards, when Pythagoras started the study of mathematics in Greece, and advanced the idea that the Earth is spherical, throughout the 5th century BC, when one of the founders of Greek metaphysics, Heraclitus, “was teaching his doctrine of eternal Becoming, flux not fix, an identity of perpetual change, process not substance, the flow that made it impossible to step into the same river twice”, arguing against the deeply rooted beliefs of his opponent, Parmenides, “a man for whom nothing changed”, and who “taught instead the supremacy of godhead and the certainty of matter” (GS 10), the evolution of Greek thinking underwent a series of attempts to reconcile the spiritual and the material world. Although Heraclitus had added to the *being* of his predecessors the concept of *becoming*, the followers of Parmenides held the conviction that “[e]ither things existed or they did not”, so once again “Becoming was challenged by Being” (GS 10). As a result of the inability to reconcile these two opposing views of the world, “the Greeks fashioned the ingenious compromise of dividing spirit and matter” (GS 10):

“Written along the clear line of demarcation was the new view of the Atomists that matter was made out of basic building blocks; passive intrinsically dead particles, moving in a void. Their movement was controlled by the individual spirit of man and the over-spirit of god. This cosmic picture, so well-known to us that it has become axiomatic, was systematised and refined by Aristotle.” (GS 10)

¹ in Arntz, Chasse, Vincente & Forem, 2005: 2.12

Protesting against Protagoras's view that "Man is the measure of all things", and convinced that the Sophists' relativism was an inaccurate theoretical approach, Socrates (469-399 BC) and his pupil Plato (428-347 BC) promoted the idea that universal truths do exist, and that therefore it is possible to make the distinction between right and wrong. Aristotle (384-322 BC) wrote a summary of Pythagoras's doctrines, yet did not restrict his endeavours to the field of either mathematics or philosophy, which Plato had chosen to focus on, but explored almost all the extant branches of knowledge, such as biology, physics, astronomy, psychology, and literary theory, and set the basis for zoology and formal logic. Given Aristotle's outstanding contributions to both scientific and philosophical study, it is not surprising that his works have had tremendous reverberations on the development of Western thought, through the Middle Ages, when Science still fraternised with Religion, until our very own modern times:

"Matter and Mind, Matter and Form, were persuasively interpreted and later incorporated entire by developing Christianity. That science and the Church should be tied together until the Renaissance was made possible by the dualistic system of the mundane and the miraculous that suited the world-view of both interested parties." (GS 11)

As Anne Baring (2005) points out, the greatest cultures of the ancient world "experienced the divine as imminent in the material world" and addressed the Earth and the cosmos "as 'thou', not 'it' ", which proves that people "felt they participated in a great cosmic mystery of which they were a part"². This stairway between the human and the divine collapsed in the 16th century as a result of the Church's attempt to turn its dogma into law, in order to preserve absolute power. Nicolas Copernicus's suggestion that the Earth is not the centre of the Universe, but part of a heliocentric system, having the Sun at its centre, as well as Giordano Bruno's belief that our system composed of the Sun and its planets is just one of the many systems existing in the infinite universe, and Galileo Galilei's support of the Copernican model with its concept of a system of spinning planets revolving around the Sun, were regarded as heretical by the Church, and, with the exception of Copernicus, who died of natural causes before the Inquisition had the chance to excommunicate him, these scientific discoveries led to severe punishment, ranging from house arrest for Galileo, to imprisonment followed by death by burning at the stake in the case of Giordano Bruno. Although the discoveries of Galileo in the early 1600s put an end to the Roman Catholic Church's monopoly of knowledge, as Arntz, Chasse, Vincente and Forem (2005) point out, scientists "did not pick battles with the Church", knowing this to be "hopeless and dangerous", so they "restricted their activities to probing the mysteries of the matter"³ at the expense of energy, or spirit. Even Sir Isaac Newton, in spite of his revolutionary discoveries leading to

² in Arntz, Chasse, Vincente & Forem, 2005: 2.13

³ in Arntz, Chasse, Vincente & Forem, 2005: 2.14

the establishment of a new scientific paradigm, bowed in front of the Church, “did not question the dominant worldview” of the time, and stated that “Atheism is so senseless and odious to mankind that it never had many professors.”⁴ Through Newton’s work, Euclid’s research on the properties of numbers, on proportion in general, plane and solid geometry became so influential that they determined the course of Western scientific thought until modern times:

“The tenacity of the model should not be underestimated. Newton made it the basis for his *Mechanics* in the seventeenth century and rested his clockwork universe firmly in the principles of Euclid. Firming up Greek thought, it was Newton who realised concepts of absolute space and absolute time, Newton who regarded the Universe as three-dimensional, solid, massy, hard, made up of the motion of material points in space, a motion caused by their mutual attraction, that is, the force of gravity.” (GS 11)

Newton’s classical mechanistic model greatly influenced not only the field of mathematics, but infiltrated into all the branches of science, from astronomy, to biology, physics and chemistry:

“The mathematics he developed to explain his proposals were of such astounding success that no one thought to enquire behind them into the validity of the Newtonian world itself. His theories remained triumphant and unchallenged until 1905 when Albert Einstein published two papers; one, his ‘*Special Theory of Relativity*’, and the other, a look at the disturbing implications of electromagnetic radiation. These were the beginnings of quantum physics and the end of the mechanistic, deterministic, mind/matter of cosmic reality.” (GS 11)

But in the history of science, before Einstein’s discoveries, there figure many other scientists and theories instrumental in the final rift between science and religion, as well as philosophers/scientists such as René Descartes (1596-1650), who upheld further splits of mind and body, spirit and matter, and Francis Bacon (1561-1626), who eventually succeeded in promoting a different, intrusive approach to scientific enquiry, at the expense of a wise understanding of the natural order meant to help people live in harmony with the natural world:

“As Fritjof Capra has pointed out, Bacon viewed the scientific enterprise in terms that were ‘often outright vicious’. Nature had to be ‘hounded in her wanderings,’ ‘bound into service,’ and ‘made a slave.’ The job of the scientist was to ‘torture nature’s secrets from her.’ Unfortunately, this attitude that sought to extract knowledge in order to control and dominate nature (described as a “her”) has become a guiding principle of Western science. Bacon summed it up in a phrase we all learned in school: ‘*Knowledge is Power.*’” (Arntz, Chasse, Vincente & Forem, 2005: 2.14)

Both Cartesianism, which questioned the existence of God, and Bacon’s philosophy served to justify, in the eyes of their followers, the selfish, irresponsible

⁴ in Arntz, Chasse, Vincente & Forem, 2005: 2.16

exploitation of our planet's natural resources, and the privileging of matter over energy in all types of investigation:

"In our search for the direct road to truth, we should busy ourselves with no object about which we cannot attain a certitude equal to that of the demonstration of arithmetic and geometry." (Descartes⁵)

In the late 19th century, Darwin's theory of evolution by natural selection hammered the final nail in the coffin of natural harmony, as it argued against the existence of God and, in the absence of a "creative intelligence guiding the unfolding of the galactic life" human beings were depicted as nothing but "random mutations, carriers of DNA's relentless quest for more, in a meaningless universe."⁶ Attempts to reinstate the balance between the rational and the spiritual, between matter and energy, between body and mind began to be made only after scientists such as Georg Bernhard Riemann (1826-1866), James Clerk Maxwell (1831-1879), Albert Einstein (1879-1955), Niels Henrik David Bohr (1885-1962), Erwin Schrödinger (1887-1961), Werner Heisenberg (1901-1976), and other influential researchers managed to crack open "the stranglehold of materialism" and to show that, if probed deeply enough, matter will no longer prove to be immutable, hard and eternal, but will disintegrate before our very eyes, and dissolve into "unfathomable energy"⁷. As Alice states, in Winterson's *GUT Symmetries*, "Energy precedes matter" (GS 19).

In *GUT Symmetries* love relationships are paralleled with geometrical patterns:

"I said there was a love affair. In fact there are two. Male and female – God created them and I fell in love with them both. If you want to know how a mistress marriage works, ask a triangle. In Euclidean geometry the angles of a triangle add up to 180 degrees and parallel lines never meet. Everyone knows the score, and women are held in tension, away from one another. The shape is beguiling and it could be understood as a new geometry of family life." (GS 16-17)

But in light of the idea that "we are what we know" (GS 18) it would have been unlikely, jokes the narrator, for such a triangular relationship to form before the scientific discoveries that brought science to the post-Newtonian / post-Euclidean age:

"Unfortunately, Euclidean theorems work only if space is flat. In curved space, the angles over-add themselves and parallel lines always meet.

His wife, his mistress, met. Perhaps if this story had happened before 1856 I should not be telling it to you at all." (GS 17)

⁵ in *Microsoft Encarta Reference Library* 2004

⁶ in Arntz, Chasse, Vincente & Forem, 2005: 2.18

⁷ in Arntz, Chasse, Vincente & Forem, 2005: 2.19

At the end of the 19th century, however, the two-thousand-year-old Euclidian geometry, whose viability was found to be restricted to the confines of flat surfaces, was replaced by the new Riemannian Geometry, based on higher-dimensional space:

“In the nineteenth century, most people knew their place, even if they did not know the mathematics that predicated it. In a strictly three-dimensional world, where the shortest distance between two points is a straight line, the comings and goings of sexual intrigue could be measured with a reassuring accuracy.

1856. A poor obscure tubercular German called Riemann delivered a lecture calculating that Euclid is valid only in terms of flat surfaces. If the surface were to turn out not to be flat then two thousand years of mathematical smugness might not be smiling.” (GS 17)

Riemann’s ideas of using higher dimensions to simplify the laws of nature, and of using geometry in order to describe the notion of ‘force’ were soon forgotten, but only to be later brought to life by a man keen on asking extremely simple, nevertheless great questions:

“Sixty years later, a poor obscure German called Einstein realised that light beams bend under gravity. Therefore, the shortest distance between two points is a curve.

If light travelled in a curved line it would mean that space itself is curved.” (GS 17)

Einstein’s general theory of relativity opened up new ways of thinking about the world in terms of a higher-dimensional approach able to help scientists solve the field theory of strings. From the very beginning of her story, as she presents the image of the Swiss Renascentist physician Paracelsus (1493-1541), and the idea of Hermetic alchemy which aimed at finding symmetry between spirit and matter⁸, Winterson’s narrator, Alice, mentions the necessity of at least four, if not ten dimensions for a coherent outline of our world as a whole:

“PROLOGUE

November 10 1493. Einsiedeln, Switzerland. Sun in Scorpio. [...] Paracelsus, physician, magician, alchemist, urge, demiurge, *deus et omnia* was born under the sign of the occult, ruled by Mars and driven by a mountain in his soul. [...] Like his contemporary, Luther, Paracelsus wanted to change the whole world. [...] The poisoner and the scientist are one. And both. This was not the nineteenth-century model of diagnosis by pathology. It was, if it was anything, diagnosis by cosmology. Paracelsus was a student of Correspondences: ‘As above, so below.’ The zodiac in the sky is imprinted in the body. ‘The galaxa goes through the belly.’ [...] The Miracle of the One that the alchemists sought is not so

⁸ Omega (2006: 176-177) elaborates on the goal of Hermetic alchemists to facilitate a “chymic wedding” of opposites through “amor vulgaris”.

very far from the infant theory of hyperspace, where all the seeming dislocations and separations of the atomic and sub-atomic worlds are unified into a co-operating whole. This is not possible in three spatial dimensions or even in four. Ten, at least, lure us out of what we know." (GS 1-2)

The same idea punctuates later comments of the same narrator, be they on the relationship between alchemy and quantum theory,

" 'As above so below' may prove to be more than a quaint alchemical axiom. Following the Superstring theory, the symmetry we observe in our universe is only a remnant of the symmetry to be observed in perfect ten-dimensional space." (GS 98-99)

or on the nature of love and death in light of the revelations of quantum mechanics with respect to the nature of matter and energy:

"*Cogito ergo sum* or is it *Amo ergo sum*? I think therefore I am? I love therefore I am? What has defined me at the clearest point of my out-spread life has been my love for you. Not a raft or a lifebelt. A fix in the flux.

Matter is provisional and that includes me. Matter has at best a tendency to exist, and will, it seems, divide infinitely because there is no there there. There are vibrations, relationships, possibilities and out of these is formed our real life.

Still and still moving matter. String paradox of the restless and the formed. If the physics is correct then we are neither alive nor dead as we commonly understand it, but in different states of potentiality." (GS 206-207)

The widely celebrated Cartesian phrase "I think, therefore I am" is paraphrased by Alice, a physicist inclined more towards the new physics than towards modern scientific theories. Schrödinger's Cat experiment is introduced with a metaphor combining GUT with gut, in a word-pun significant for the interpretation of the novel's title: "The new physics belch at the politely seated dinner table of common sense" (GS 207):

"An imaginary cat is put in a box with a gun at its head. The gun is connected to a geiger counter. The geiger counter is triggered to a piece of uranium. Uranium molecules are unstable. If the uranium decays, the process will alert the geiger counter, which in turn will cause the gun to fire. So much for the precarious fate of the Virtual cat. To observe the cat's fate we will have to open the box, but what is the state of the cat before we open the box? According to the mathematics of its wave function, it is neither alive nor dead. The wave function describes the sum of all possible states of the cat. Until a measurement is made we can't actually know the state of the particle. The cat, like it or not, is a series of particles. It shares the potentiality of the entire universe. It is finite and infinite, dead and alive. It is a quantum cat." (GS 207)

Alice's comments on the relevance of this experiment echo Einstein's reactions to Schrödinger's wave function and to the concept of the particle as a sum of all possible states proposed by Bohr and Heisenberg:

“Absurd? Yes. Einstein, who could not refute the mathematics or deny the evidence of the experiments, hated the conclusion. What kind of a conclusion is it? The truth is, we don’t know. As yet, the cat has outsmarted us.

Open the box? Not me. I will see what I expect to see, the cat either dead or alive. I cannot see past my three-dimensional concept of reality, bound as it is to good/bad, black/white, real/unreal, alive/dead. Mathematics and physics, as religion used to do, form a gateway into higher alternatives, a reality that can be apprehended but not perceived. A reality at odds with common sense.” (GS 208)

Thus, just like religion, quantum physics seems to rely on faith over common sense. Michio Kaku (1995: 330) shows that scientists have actually been accused of “creating a new theology based on mathematics” thus driving people away from “the mythology of religion” only to make them “embrace an even stranger religion based on curved space-time, particle symmetries, and cosmic expansions”. Theorists like Neil Forsyth (1995) argue in favour of preserving the separateness between science and religion, mentioning that in 1919, when the Archbishop of Canterbury expressed his concerns about the effects of the general relativity theory on theology, he was personally reassured by Einstein that “relativity had no implications for religion”, and concluding that this is “a lesson most of us, Einstein perhaps included, never learned”⁹. Michio Kaku (1995: 330), however, points out that the long-lasting debate on the relationship between science and religion originated in the fact that the word God means different things to different people, and that, therefore, the conflict can be solved if we “differentiate between the God of Miracles and the God of Order”. The former is the God non-scientists refer to, while the latter is the God scientists refer to, since “the foundation of science is based on observing reproducible events, but miracles, by definition, are not reproducible. They happen once in a lifetime, if at all” (Kaku, 1995: 331). Kaku’s conclusion (1995: 332) is that, all things considered, “The God of Miracles has one powerful advantage over the God of Order”, as the God of Miracles is able to “explain the mythology of our purpose in the universe”, whereas “on this question, the God of Order is silent”. Alice’s interpretation of God is definitely a scientific one:

“As an armchair atheist I stumble into God as soon as I get up and walk. I do not know what God is, but I use it as a notation of value.

God = highest value. Force and freedom of the thinking universe”. (GS 160)

Alice’s father, David, was a thinker as well, who “had given up his religion but not the superstition that accompanied it” and therefore interpreted Alice’s misery “as a proof positive of Original Sin”. Since he firmly believed in the principle of causality, and as there could be no reason for Alice to be unhappy, David finally concluded that “unhappiness must be the human condition” (GS 65-66). Alice’s father seems at first to be the embodiment of the mechanistic scientific

⁹ Forsyth, N. (1995). Review of *Strange Attractors: Literature, Culture and Chaos Theory* by Harriet Hawkins. New York: Prentice Hall, 1995. Available: <http://www.richmond.edu/>

view, as his image is associated with the symbol of the clock: a man "whose time was measured in quarter hours", for whom his gold watch was essential, but who "seemed not to mind the demands of his pocket watch". Unable to speak what he felt, David always "dealt with difficult questions by knocking them out. What is unconscious does not speak and that included the hidden part of himself" (GS 52). However, later on in the novel, Alice's story about her father's magic tricks casts new light on David's beliefs, as he favours energy over matter, much as the advocates of Superstring Theory do:

"Perhaps he was right. Perhaps there is no table. Perhaps the firm surface of order and stability is as much an illusion as a silk handkerchief over a non-existent glass. Glass and table have long since disappeared but the shape remains convincing. At least until we learn how it's done.

If the Superstring theory is correct there is no table. There is no basic building block, no firm stable first principle on which to pile the rest. The cups and saucers are in the air, the cloth levitating under them, the table itself is notional, we would feel uncomfortable eating our dinner without it, in fact it is a vibration as unsolid as ourselves." (GS 159)

After pushing out of her mother's "chthonic underworld" into her father's "world of difficulty and dream" (GS 73) Alice began to "imagine other places, glowing steadily, just out of reach" (GS 60) and to make lists, in the form of "correspondences, half true and altogether fanciful, of the earth the sea and the sky" in an attempt to hold together her own world "that was in so much danger of falling away" only to realise that she "wanted order where there was none" (GS 72). That Alice is different from her father is obvious when it comes to her perception of and interest in alchemy, to which she turns repeatedly, in an attempt to make sense of the unreliability of identity, the uncertainty of each individual's role in this world, and the distortion maiming any reflection of reality:

"The alchemists worked with a magic mirror, using reflection to guide them. The hall of mirrors set around me has been angled to distort. [...] Everywhere I go, reflection. Everywhere a caught image of who I am. In all of that who am I? [...] I could not find myself in the looking-glasses offered. I could not define myself in relation to the shifting poles of certainty that seemed so reliable. What was the true nature of the world? What was the true nature of myself in it?" (GS 12)

Alice feels that there seems to be "no bridge between mind and matter, between [herself] and the world, no point of reference that was not a handy deception" (GS 12), and voices the contrasting tendencies driving her actions: "As a scientist I try to work towards certainties. As a human being I seem to be moving away from them" (GS 27). But Alice's intuition regarding the true aim of alchemists, the realisation of which could give people's lives meaning and purpose, is outstanding:

“The dream: to pan the living clay that you are and find gold in it.” (GS 54)

“The difficulty and the dream were not separate. To pan the living clay that you are is to stand in the freezing waters and break yourself on a riddle of your own making.” (GS 69)

“Say alchemy to most people and they will say, ‘Turn metal into gold.’ Yet what Paracelsus and the alchemists wanted was to make themselves the living gold. The treasure without moth or rust, spirit (*pneuma*) unalloyed.” (GS 102)

In agreement with Stephen Hawking’s eloquent explanation that “the ultimate triumph of human reason” is to answer the question of “why it is that we and the universe exist”, Kaku (1995: 334) concludes that “being blessed with the intellect to divine the ultimate secrets of nature gives meaning enough to life”.

The search for truth is encumbered due to the fact that “[e]verything possible to be believed is an image of truth” (GS 213), especially since “[t]he most plausible explanations usually are lies” (GS 214). Alice wonders about the relationship between truth and knowledge, and starting from the meaning of the verb “to know” in Hebrew and its use in the Torah, rejects facts in favour of connections, and argues against the separation of fields, for a holism meant to bring life to scientific endeavours:

“Is truth what we do not know?”

What we know does not satisfy us. What we know constantly reveals itself as partial. What we know, generation by generation, is discarded into new knowings which in their turn slowly cease to interest us.

In the Torah, the Hebrew ‘to know’, often used in a sexual context, is not about facts but about connections. Knowledge, not as accumulation but as charge and discharge. A release of energy from one site to another. Instead of a hoard of certainties, bug-collected to make me feel secure, I can give up taxonomy and invite myself to the dance: the patterns, rhythms, multiplicities, paradoxes, shifts, currents, cross-currents, irregularities, irrationalities, geniuses, joints, pivots, worked over time, and through time, to find the lines of thought that still transmit.

The facts cut me off. The clean boxes of history, geography, science, art. What is the separateness of things when the current that flows each to each is live? It is the livingness I want. Not mummification. Livingness.” (GS 82-83)

Alice is open to the scientific method of quantum physics and its philosophical implications of indeterminacy springing from Heisenberg’s Uncertainty Principle which states that an observer is limited from knowing both the velocity and the exact location of an electron with absolute certainty:

“Quantum theory states that for every object there is a wave function that measures the probability of finding that object at a certain point in space and time. Until the measurement is made, the object (particle) exists as a sum of all possible states. The difficulty here, between the logical common sense world and the complex, maverick universe, is that at a sub-atomic level, matter does not exist, with certainty, in definite places, rather it has a *tendency to exist*. At the sub-atomic level, our

seeming-solid material world dissolves into wave-like patterns of probabilities, and these patterns do not represent probabilities of things but probabilities of connection. Atlas 0 Ariadne 1. The hard-hat bull-nose building blocks of matter, manipulated by classical physics, now have to be returned as an infinite web of relationships. [...] A wave function spreads indefinitely, though at its farthest it is infinitesimally flimsy." (GS 161)

The paragraph above points both to Einstein's Relativity Theory that mass and energy are equal, as every particle actually consists of energy, and to his subsequent discovery that light energy manifests itself in discreet units called quanta, which led Heisenberg to develop his Uncertainty Principle. These two demonstrations, explains Onega (2006: 79) "transform the static image of the universe into a network of ever-changing interactions, where all activities in the cosmos are intimately and immediately connected with each other", and thus "provide striking scientific confirmation of the mythical belief in the unitary wholeness of the universe" (Onega, 2006: 79). Alice uses these scientific theories to explain her father's death and to draw a parallel between her grandmother's religious conception of death and the scientific interpretation:

"My grandmother's old-fashioned religious comfort of an afterlife may not be as soft-headed as some believe. [...] What physicists identify as our wave function may be what has traditionally been called the soul. My father, at the moment of physical death, may simply have shifted to an alternative point of his wave function. What my grandmother believes in and what I speculate upon, seems only to be a difference in terminology. She hopes he is in heaven. I hope he has found the energy to continue along his own possibility." (GS 160-162)

Alice clearly states her rejection of Newtonian mechanics and her support of quantum mechanics, in spite of the latter's sometimes puzzling results, which may mean that Alice realises, as Niels Bohr did, that although "[t]he opposite of a fact is falsehood, [...] the opposite of one profound truth may very well be another profound truth":

"The model of the universe as mechanical has no basis in fact. In a quantum universe, heaven and hell are simply parallel possibilities. In our Judeo-Christian myth-world, Eve ate the apple. In a symmetrical myth-world next door, Eve did not. Paradise lost. Paradise unlost. Objections to this are logical but quantum mechanics is not interested in our logic. Every quantum experiment conducted has shown, again and again, with dismaying mischief, that particles can hold positions contradictory and simultaneous." (GS 160)

The American physicist J.R. Oppenheimer (1904-1967) is quoted twice in *GUT Symmetries*, with the same Zen-like description of the structure of probability clouds:

"If we ask, whether the position of the electron remains the same, we have to say no. If we ask, whether the position of an electron changes with the course of time, we have to say no. If we ask, whether the electron is in a state of

rest, we have to say no. If we ask, whether the electron is in motion, we have to say no.” (GS 82, 160-161)

All this is not impossible to comprehend for Alice, who finds comfort and consolation in the theories of quantum physics:

“Stuff of science fiction? If there are parallel universes my authentic father could have been living on any one of them, leaving us with his distorted self.

Infinite grace. Infinite possibility. The mercy of the universe extended in its own laws. According to quantum theory there are not only second chances, but multiple chances. Space is not simply connected. History is not unalterable. The universe itself is forked. If we knew how to manipulate space-time as space-time manipulates itself the illusion of our single linear lives would collapse. And if our lives here are not the total our death here will not be final.” (GS 159-160)

Aware of the necessary harmony between the transcendent powers of the mind and the physical reality of the body, Alice realises the inaccuracy of the Cartesian distinction between thinking substances, or minds, and extended substances, or bodies:

“Sceptical? The laws of physics concern themselves with what is possible not what is practical.

The property of matter and light is very strange. How can we accept that everything can be, at the same time, an entity confined in volume (a particle) and a wave spread out over huge regions of space? This is one of the paradoxes of quantum theory, or as the Hindu mystics put it centuries ago, ‘smaller than small, bigger than big’. We are and we are not our bodies.

If we accept Hawking’s idea that we should treat the entire universe as a wave function, both specifically located and infinite, then that function is the sum of all possible universes, dead, alive, multiple, simultaneous, interdepending, co-existing. Moreover, ‘we’ and the sum universe cannot be separated in the way of the old Cartesian dialectic of ‘I’ and ‘World’. Observer and observed are part of the same process. What did Paracelsus say? ‘The galaxa goes through the belly.’ ” (GS 161-162)

Michael Hardin shows that ever since the ancient times philosophers have “expressed anxiety about the fallibility of the human observer” – in Book X of *The Republic*, Plato wrote that “the same things can look crooked and straight to people looking at them first in water and then out of water. [. . .] Things like shadow-painting, conjuring, and all the other arts of the same kind rely on this weakness in our nature to produce all sorts of magical effects”¹⁰:

¹⁰ Quoted in Hardin, M. (2004). “From GUTS to God: Credulity, Postmodernism, and Contemporary Physics”. In C. J. Smith and R. Froemke (Guest Editors) *Reconstruction: Studies in Contemporary Culture*. Fall 2004: Vol.4, No 4. Available: <http://reconstruction.eserver.org/044/home.htm>

"Put your hand in the water to reach for a sea urchin or a seashell, and the thing desired never quite lies where you had lined it up to be. [...] Reach in to lift it out, and your hand misses. The water is deeper than you had gauged." (PB 110)

But although Plato's observation, says Hardin (2004), seems to validate Lyotard's belief that "the human as observer (or scientist) is susceptible to error", this very same observation suggests that "a knowable truth exists (the object in the water, despite appearing crooked, is straight)", therefore "one merely has to know the proper way to observe the truth" (Hardin, 2004)¹¹. However, the notion of the observer as no longer external and neutral, but becoming, himself, a part of the observed reality through the act of measurement does away with the ideal neutrality of the experimenter and may eventually mean that ultimate truth is unknowable. To point this out, frequent allusions are made to Heisenberg's Uncertainty Principle, according to which "[t]he act of measuring one magnitude of a particle, be it its mass, its velocity, or its position, causes the other magnitudes to blur", but not necessarily due to "imprecise measurements", as technology is "advanced enough to hypothetically yield correct measurements", which ultimately means that "[...] the blurring of these magnitudes is a fundamental property of nature."¹² Heisenberg's Uncertainty Principle is frequently associated with Kurt Gödel's incompleteness theorem, which states that all logical systems are, by definition, incomplete, a theorem which has enjoyed a number of provocative interpretations: that computers will never replace humans, since they function on the basis of finite sets of axioms and can never discover new truths, or create original utterances to describe innovative ideas; that since the human mind is a closed system, it is impossible for human beings to know themselves completely, because the mind can only rely on what it already knows in order to assess what it really knows; that, consequently, one can never truthfully and totally represent oneself. Alice's narrative seems to be informed by all these theoretical considerations. From the start of her narrative, Alice insists on the idea that the outcome of an experiment depends on the view of the observer:

"Any measurement must take into account the position of the observer. There is no such thing as measurement absolute, there is only measurement relative. Relative to what is an important part of the question. (GS 9)

Later in the novel, the German physicist Max Plank is quoted on the issue of the observer's unreliability:

"Science cannot solve the ultimate mystery of nature because we ourselves are part of nature and therefore part of the mystery we are trying to solve. (Max Plank)" (GS 82)

¹¹ Hardin, M. (2004). "From GUTS to God: Credulity, Postmodernism, and Contemporary Physics". In C. J. Smith and R. Froemke (Guest Editors) *Reconstruction: Studies in Contemporary Culture*. Fall 2004: Vol.4, No 4. Available: <http://reconstruction.eserver.org/044/home.htm>

¹² <http://www.thebigview.com/spacetime/questions.html>

Alice's comment, that "Perhaps some things take more than a single lifetime to complete. Perhaps I too have begun to imagine more than can be seen with the instruments we as yet possess" (GS 218) is in line with Edward Witten's assertion that "String theory is twenty-first century physics that fell accidentally into the twentieth century" (Kaku, 151). Alice asks: "Now that physics is proving the intelligence of the universe what are we to do about the stupidity of humankind?" (GS 11), and then elaborates on the limitations of perception we are condemned to by our previous conditionings:

"I know that space is curved, but my brain has been cordoned by habit to grow in a straight line. What I call light is my own blend of darkness. What I call a view is my hand-painted *trompe-l'oeil*. I run after knowledge like a ferret down a ferret hole. My limitations, I call the boundaries of what can be known." (GS 11-12)

At times, Alice's meditations on the nature of knowledge mirror William Wordsworth's *Ode on Intimations of Immortality*, which voices deep sadness at the loss of the original sense of oneness, characteristic of a child's undivided relation to Nature in his early years, which favours a complete harmony between the human spirit, nature and the transcendental order. The adult is doomed never to recover this plenitude of feeling, which fades away with the passing of time:

"There was a time when meadow, grove, and stream,
The earth, and every common sight
To me did seem
Apparelled in celestial light,
The glory and the freshness of a dream.
It is not now as it hath been of yore; --
Turn wheresoe'er I may,
By night or day,
The things which I have seen I now can see no more.
[...]
Whither is fled the visionary gleam?
Where is it now, the glory and the dream?
Our birth is but a sleep and a forgetting;
[...]
Heaven lies about us in our infancy!
Shades of the prison-house begin to close
Upon the growing Boy,
But he beholds the light, and whence it flows,
He sees it in his joy;
The Youth, who daily farther from the east
Must travel, still is Nature's priest,
And by the vision splendid
Is on his way attended;
At length the Man perceives it die away,
And fade into the light of common day."¹³

¹³ Wordsworth, W. (1999). *Complete Poetical Works*. <http://www.bartleby.com/145/ww331.html>

Similarly, Ali, the protagonist of *The PowerBook* mentions that "As you get older, the open spaces start to close up" (PB 38), while Alice states that "All children stumble over what Einstein discovered; that Time is relative" (GS 23); later on she wonders, rhetorically, "What can a little girl see that astronomers and telescopes cannot?" (GS 73) and expresses her trust in children's intuitive knowledge and in their intimate connection with the infinite beauty of nature:

"When children learn to count they naturally add and multiply. Subtraction and division are harder to teach them, perhaps because reducing the world is an adult skill." (GS 20)

The 'adult' in this story is Jove, the male physicist that Alice falls in love with. Jove's scientific formation differs from Alice's, as Alice herself states: "I used to argue with Jove about wave functions. What to him were manipulatable facts were for me imaginative fictions" (GS 206). Prompted by quantum theory, Alice asks important questions about reality and representation:

"Experimentally, it is beyond doubt that electrons exhibit contrary and simultaneous behaviour. What does that suggest about us? About our reality? What is unwritten draws me on, the difficulty, the dream.

We cannot talk about atoms anymore because 'atom' means indivisible. We have split it. Can we talk about reality anymore when reality means 'that which actually exists. Not counterfeit or assumed.' What does actually exist? The universe has become a rebus." (GS 206)

Our perception of reality, its accuracy and relevance, remains at the forefront of Alice's preoccupations: "We are what we know. We know what we are. We reflect our reality. Our reality reflects us. What would happen if the image smashed the glass?" (GS 18). These maxims and questions seem to recall Mary Catherine Bateson's realisation that we can get to know the world not directly, but only through the metaphor we are for it ourselves¹⁴.

Even Stella, Jove's wife, a poet who balances her German mother's "practical nature" with "her Jewish father's visionary rantings"¹⁵, exhibits openness towards the principles of quantum physics, and states that: "For my purposes a single objective reality will not do" (GS 192). Stella's position is grounded in her origins – "I come from a people to whom the invisible world is everyday present" (GS 44), says Stella, – and in her upbringing, as shown by her father's characterisation:

"He wanted to transcend the illusion of matter. In the 1920s and 1930s, before he had fled Austria, Papa had corresponded with many of the scientists who were trying to understand, through quantum theory, what the world might really be like. He had been close to Werner Heisenberg whose strange notions of the

¹⁴ Bateson, M. C. (1972). *Our Own Metaphor – A Personal Account of a Conference on the Effects of Conscious Purpose on Human Adaptation*. Washington DC: Smithsonian Institution Press.

¹⁵ *Kirkus Reviews*. Available: <http://www.amazon.com/gp/>

simultaneous absence and presence of matter had stimulated Papa into investigations of his own. In the paradoxes of Kabbalah he found the paradoxes of new physics. When Heisenberg told him that every object can be understood as a point (finite, bounded, specific) and as a wave function (spreading infinitely though concentrated at different rates), Papa wanted to discover whether or not he could move himself along his own wave function, at will, while alive in his body. If gross matter is reducible to atoms, and the atom itself subject to unending division, then the reality of matter is conceptual.” (GS 168)

Due to the fact that Stella had a squint when she was a child, her father, Ishmael, predicted that “she will be a poet”, while her mother deemed it as a mere “defect of vision”, a condition that some critics assigned to certain painters whose innovations in the representation of light had left them perplexed:

“Defect of vision. Do I mean affect of vision? At the beginning of the twentieth century when Picasso, Matisse, and Cezanne were turning their faces towards a new manner of light, there was a theory spawned by science and tadpoled by certain art critics that frog-marched the picture towards the view that this new art was an optical confusion. Nothing but a defect of vision. The painters were astigmatic; an abnormality of the retina that unfocuses rays of light. That was why they could not paint realistically. They could not see that a cat is a cat is a cat. [...]

Perhaps art is an eye problem; world apparent, world perceived.
Signs, shadows, wonders.
What you see is not what you think you see.” (GS: 81)

Stella’s subjectivity and her perception of the universe as chaotic and unsystematic oppose Jove’s worldview as ordered, hierarchical and objectively knowable; he states: “I don’t mind my wife telling me stories. I worry when she can no longer distinguish between the fanciful and the actual” (GS 193), and blames her mystical tendencies on the quirks characteristic of her gender:

“All of us have fantasies, dreams. A healthy society outlets those things into sport, hero-worship, harmless adultery, rock climbing, the movies. Unhealthy individuals understand their dreams and fantasies as something solid. An alternative world. They do not know how to subordinate their disruptive elements to a regulated order. My wife believed that she had a kind of interior universe as valid and as necessary as her day-to-day existence in reality. This failure to make a hierarchy, this failure to recognise the primacy of fact, justified her increasingly subjective responses. She refused to make a clear distinction between inner and outer. She had no sure grasp either of herself or of herself in relation to the object. At first I mistook this pathology as the ordinary feminine.” (GS 190-191)

Jove’s position is that of a rational materialist, a sound-thinking professional and an atheist, able to tell the difference between “honest science” and that which “is not science at all”, and who believes that there is a reasonable explanation for everything, even if, for a while at least, it eludes all researchers’ attempts:

"I am in sympathy with an organic view of nature; a symbiotic participating structure that in no way resembles Newton's Mechanics. Every day my work surprises me and I am sceptical of theories that seem to point to truth but just don't fit the facts. Physics cannot rig the evidence, either it is honest science or it is not science at all. Call it alchemy, astrology, spoon-bending, wishful thinking. All of which my wife enjoyed, along with a mystical disposition that sadly, some of my colleagues share. There is nothing mystical about the universe. There are things we cannot explain yet. That is all." (GS 191)

He dismisses quantum theories in favour of the relativity theory, harbouring the belief that the former somehow miss the point, and thus taking Einstein's part in his dispute with Heisenberg:

"Matter is energy. Of course. But for all practical purposes matter is matter. [...] The shifting multiple realities of quantum physics are real enough but not at a level where they affect our lives." (GS 191)

Jove's dialogue with Stella, while they are stranded at sea for days on end, points to the stubborn rationality of the first in contrast with the open-mindedness of the latter:

" 'Maybe we've sailed through one of your wormholes and come up in a parallel universe. In this universe, identical to our own, there are no people.'

He turned to me in a fury. 'Stupid, stupid, stupid. The probability is beyond calculation. A large quantum transition such as that is virtually impossible.'

'Virtually?' " (GS 180)

Jove seems to be, at the same time, reductionist and holist, since another conversation with his wife shows that he does not deny the possibility that parallel universes, or possible worlds might exist, but seems to be happy within the confines of his actual world:

S: 'What's down there?' [...]

J: 'You and me in another life.'

S: 'Do you think we'll ever find it?'

J: 'What's wrong with this one?' (GS 47)

Stella, however, a poet by training and by nature as well, perceives reality differently, in the two different worlds – the external world of rationality and reason, symbolised by air and light, and the interior world of intuition, inspiration and feeling, symbolised by water and darkness:

"Under there, where what I am sure of is back to front, inside out, reversed, I feel in the way that I presently think, that is constantly, lucidly, testing all experience against feeling, clear and powerful as the water it suspends in.

Here, what I know by sensation, there, I know by intuition.

My empirical finger-tips numb and I can't open my eyes. What I see, what I touch is interior, either I am inside it or it is inside me. It is only vague when I subject it

to the laws of the upper air. It is as though there is an entirely other way of being that makes no sense to my world, any more than my world makes sense to it. I cannot connect the two; the watery world won't move up into the dry bright light that I live in and when I take the dry bright light down there it immediately de-charges, leaving me to fumble my way in the dark.

This has been happening for years and I used to conceive of it as a poet's place or a place of inspiration; a place I imagined but where I could never actually visit. It comes closer to me than I am able to come to it. Dreams do dream us, don't they? We are not the ones in control." (GS 47)

Stella sees her husband as "the man that prises open the deepest clams of matter" and inquires, ironically, as if to suggest her awareness regarding his unreliability: "Would you go fishing with him?" (GS 46). Although it mixes in the geometry of their love relationship, Alice's presentation of Jove is less metaphorical and more scientific, pointing out the man's interest in the most important theories of the new physics, from The Standard Model, which he rejected as incomplete, to GUTs, which he clearly preferred:

"Jove. He had been among the first of the younger physicists to criticise The Standard Model; the comprehensive theory of matter that seems to fit with so much of the experimental data. Jove called it 'The Flying Tarpaulin'; big, ugly, useful, covers what you want and ignores gravity. The attraction of the Model is that it recognises the symmetries of the three fundamental forces, weak force, strong force, electromagnetic force. Difficulties begin when these three separate forces are arbitrarily welded together.

His wife, his mistress, met.

In the 1970s Jove was working on his GUTs: Grand Unified Theories that sought to unite the strong, weak, and electromagnetic quanta in a sympathetic symmetry that would include gravity and overturn the bolt-it-together-somehow methods of The Standard Model." (GS 97-98)

Grand Unified Theories (GUTs) unite the strong, weak and electromagnetic forces: since at high energies the strong nuclear force gets weaker, while the weak nuclear force and the electromagnetic force get stronger, at a very high energy, called the grand unification energy, the three forces will have the same strength, acting just as different aspects of a single force. Eventually, Jove got over the excitement over the GUTs when he realised that, just like The Standard Model, GUTs could not include gravity, lest they would yield infinite numbers and fail to make any sense. The fact that gravity is not included seems not to matter too much, as gravity is a very weak force. However, given a sufficiently large number of matter particles, the gravitational force, being effective at large distances and being always attractive, will have its effects added up, thus dominating all other forces. Thus, gravity determines the evolution of the universe. This serious drawback caused Jove to give up GUTs and turn towards the new proposal, Superstring

Theory, equipped to describe the nature of both matter and space-time, "[t]o build matter itself from geometry,"¹⁶ as David Gross (in Kaku, 1995: 157) argued:

"Jove had a way of being in the right place at the right time. As enthusiasm for GUTs weakened (negative experimental data), he hauled himself up through the body of science on a Superstring.

According to the theory, any particle, sufficiently magnified, will be seen not as a solid fixed point but as a tiny vibrating string. Matter will be composed of these vibrations. The universe itself would be symphonic.

If this seems strange, it is stranger that the image of the universe as a musical instrument, vibrating divine harmonies, was a commonplace of Renaissance thought." (GS 98)

Unifying gravity with the other three forces is complicated by the fact that Einstein's general relativity theory does not incorporate the uncertainty principle of quantum mechanics, while the other partial unifying theories rely on quantum mechanics. One solution would be the proposed superstring theory, but it requires space-time to have either ten or twenty-six dimensions, instead of four. As different from GUTs, which refrained from including Einstein's theory of relativity, Superstring Theory relies on it, and also accounts for the symmetries found in particle physics. As Kaku (1995: 159) points out, it is for the first time that pure geometry helps explain and trace back the beauty and symmetries found in natural patterns, such as snowflakes, crystals and rainbows, as "remnants of the symmetry of higher-dimensional space". Unfortunately, experimental verification of the superstring theory requires, in order to unify the four forces, an energy impossible to produce with any generation of machines likely to be designed in the near future, and thus, Kaku (1995: 179) shows, the question that remains is whether beauty is, "by itself, a physical principle that can be substituted for the lack of experimental verification." Here is Alice's answer to this question:

"Symmetry. Beauty. Perhaps it seems surprising that physicists seek beauty but in fact they have no choice. As yet there has not been an exception to the rule that the demonstrable solution to any problem will turn out to be an aesthetic solution." (GS 98)

As for Alice, she does not fail to admit the advantages of the premise that Grand Unified Theories were based on, and insists on the necessity to promote a holistic approach to scientific research:

"GUTs had their heart in the right place; they wanted to recognise the true relationship between the three fundamental forces. Now, more than ever, crossing into the twenty-first century, our place in the universe and the place of the universe in us, is proving to be one of active relationship. This is more than a scientist's

¹⁶ Gross, D. – quoted in M. Kaku (1995). *Hyperspace. A Scientific Odyssey Through Parallel Universes, Time Wraps, and the Tenth Dimension*. New York: Anchor Books.

credo. The separateness of our lives is a sham. Physics, mathematics, music, painting, my politics, my love for you, my work, the star-dust of my body, the spirit that impels it, clocks diurnal, time perpetual, the roll, rough, tender, swamping, liberating, breathing, moving, thinking nature, human nature and the cosmos are patterned together. (GS 97-98)

Winterson's interest in scientific theories and research, which she clearly expresses in *GUT Symmetries*, points to the most important tendencies at work today in the field of scientific inquiry. The author's choice of characters, two physicists and a poet, allows for an in-depth analysis of the relationships between different domains of knowledge, perceived by the main narrator as "alternative discourses for explaining the meaning of human life in the universe" (Onega, 2006: 157) and echoes Prigogine and Stengers's careful consideration of "the communication between physics and chemistry on the one hand, and the sciences pertaining to human beings, cultures and societies, on the other" (1986: 255). This kind of communication goes way back to the first studies of equilibrium states, then of mechanics and, finally, of thermodynamics. Prigogine and Stengers (1986: 41) themselves seem to be aware that "the issues that leave their mark on a certain culture may have considerable influence on the development of scientific theories".

Winterson's fictional universe uncovered in this particular novel may seem, at first, impregnable: in the absence of a minimal background in physics, mathematics, and quantum mechanics the meaning of Winterson's Zen-like maxims cannot be grasped, which may explain the negative reviews *GUT Symmetries* received. And yet, aware of the difficulties involved in her scientific endeavour, Winterson uses her narrator to provide the critics as well as the readers with a fair warning:

"Walk with me. Hand in hand through the nightmare of narrative, the neat sentences secret-nailed over meaning. Meaning mewed up like an anchorite, its vision in broken pieces behind the wall. [...] And every story I begin to tell talks across a story I cannot tell. And if I were not telling this story to you but to someone else, would it be the same story? [...] I cannot assume you will understand me. It is just as likely that as I invent what I want to say, you will invent what you want to hear. Some story we must have. Stray words on crumpled paper. A weak signal into the outer space of each other." (GS 24)

Alice, the main narrator, aware of the difficulty of narrative communication, speaks of story writing and of fragments, thus revealing not only the unreliability of narrative, but also its power to circumscribe both the Cosmos and the universe of love:

"I know I am a fool, trying to make connections out of scraps but how else is there to proceed? The fragmentariness of life makes coherence suspect ... [...]"

The probability of separate worlds meeting is very small. The lure of it is immense. We send starships. We fall in love." (GS 24-25)

GUT Symmetries is a clear example of post-modern boundary-blurring between scientific rationalism and literary irrationalism, particularly if one considers

the intertwining and interacting currencies of physics and cosmology, chaos theory and quantum mechanics, the Kabbalah and alchemy, astrology and the pre-scientific beliefs in the tarot, all used as literary devices in Winterson's novel. The three narrators are each the embodiment of a different type of knowledge, their overlapping allowing for explicit connections among various ontological, cosmological, epistemological, religious, philosophical, and scientific categories of thought that help human beings understand the universe. Despite what some journalists and literary critics might believe, through the exposition of the fascinating science of the 1920s and after, this work may serve as a portal into the wondrous world of quantum mechanics for the less scientifically trained readers. Alex Kasman (1997) argues that it is often difficult to "tell the difference between math and physics, both in reality and in fiction", and the title of Winterson's novel "implies connections to both", given that GUT refers to the Grand Unified Theories of particle physics, and the word "Symmetry" has, in the same field of particle physics, "an entirely mathematical meaning", not "in a geometric sense but rather in the sense of abstract algebra"¹⁷. However, *GUT Symmetries* is not a book about physics, or about geometry, or even about algebra; it not a book about science, either; it is a book about life, death and the universe, about love and time, which "explores, through string theory, how we understand three-way love affairs" and, to someone familiar with it, The Standard Model could be "a rich source of imagery with its associated notions of coupling constants, symmetries and spontaneous symmetry breaking" (Nieman, 1997). But, of course, the book reads differently depending on one's background knowledge and, although Winterson's book is not informative to physicists or mathematicians, even they are likely to perceive this book as 'mathematical fiction' and enjoy it for its literary qualities, admiring Winterson's love of metaphor and her ability to combine aesthetic and scientific discourses without causing the overall narrative to collapse. This grafting of physics and poetry is Winterson's innovative method of linking science and literature, to show that the novel is a genre able to engage the dizzying advance of scientific discoveries of the 20th and 21st centuries.

¹⁷ Kasman, A. (1997). *Mathematical Fiction*. Available: <http://math.cofc.edu/faculty/kasman/MATHFICT/mfview.php?callnumber=mf261>

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REDONDANCE “POSITIVE”, REDONDANCE “NÉGATIVE”. SUR QUELQUES FIGURES DE LA REDONDANCE PAR ADJONCTION RÉPÉTITIVE

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ZUSAMMENFASSUNG. „Positiver” Wortschwall, „negativer” Wortschwall. Über einige Abbildungen des Wortschwalles durch wiederholerische Beiordnung. Im allgemeinen ist auch die umfassende Eigenschaft der schlussfolgernden Selbstvertretungen durch wechselseitige Abhängigkeit oder Bestimmung, neben der umfassenden Eigenschaft der Beifügung des Bestimmers zur Bestimmung oder der Gesetze der allgemeinen Lautlehre angenommen. Die Hinstellung durch wiederholerische Beiordnung unter diesen Fällen einiger betonenden Abbildungen des „positiven” oder „negativen” Wortschwalles, als auch die tautologischen bzw. pleonastischen Wortschwallen hat einerseits als Zweck die Stelle dieser Abbildungen unter den „Universalien des Wortschwalles” festzustellen und andererseits die besonderen Bekundungen der „positiven” oder „negativen” „Universalien des Wortschwalles” unter den „Universalien des Sprechens” im allgemeinen einzutragen. Die Tautosemantik zählt sich unter den unterscheidenden Marken des pleonastischen Wortschwalles und nicht unter den differentiellen Eigenschaften des tautologischen Wortschwalles in dem Falle, wo der Formsymmetrie des Ausdruckes ständig Asymmetrien im Bereich des Inhaltsstoffes in allen ausdrucksvollen oder überredenden Ausbeutungen, einschliesslich in der internationalen ausbildenden deutlichen Ausdrückung, sich widersetzt. Als Folge, wenn die tautologischen Aussagen nie pleonastisch sind, hingegen sind die Pleonasmen immer tautosemantische Aussagen. Die tautologischen Wortschwallen sind deswegen „positiv”, gültig oder notwendig, während die pleonastischen Wortschwallen „negativ”, irrtümlich oder nutzlos sind. Die pleonastische Syntagma vertretet also die vorträgliche Leistung einiger irrtümlich – wortschwallischen Zusätzen, Abweichungsfälle „Abweichungen von der Regel”, während die tautologischen Gestaltungen Abweichungsfälle „für Regelstärkungen” in der schönrednerischen – sprachlichen Wirtschaft des notwendigen Wortschwalles als Regime der fruchtbaren, wirksamen und überredenden Verbesserung, sind.

Il n’y a pas, jusqu’à présent, une recherche théorique fondamentale concernant les figures de la redondance rhétorique - discursive, d’autant moins une conception unitaire, au moins au niveau taxonomique, de celles-ci, on n’a pas encore élaboré ni les principes et ni les critères distinctifs du point de vue rhétorique - discursif de la syntagmatique des constructions de ce type et, certes, on n’a pas encore entrepris ni des recherches en ce qui concerne les fonctions discursives générales et particulières des figures du tableau de la redondance

rhétorique - discursive et, d'autant moins, des analyses concernant certains aspects particuliers de la redondance – positive et négative – par adjonction répétitive.

En ce qui concerne la place de la tautologie et du pléonasme dans le système des figures de la redondance rhétorique - discursive, on considère que leur position contrastive dans la configuration des *métaboles* peut être établie, dans le cadre du modèle structural de la rhétorique générale (*Le groupe μ*), dans le tableau des intersections entre les métasémèmes et les métalogiques, respectivement sur l'axe de la redondance par adjonction répétitive.¹ Vu que l'étude des composantes fonctionnelles-expressives des moyens intentionnels de réalisation de la redondance tautologique appartient à la grammaire rhétorique, respectivement à la syntagmatique rhétorique - discursive, on a remarqué, pour le type de symétrie des caractéristiques combinatoires des formes rhétoriques - discursives tautologiques, la pertinence de l'investigation de l'identité dans la forme de l'expression tautologique (on a admis ici même des expressions formelles ressemblantes ou similaires, pas seulement identiques ou homographes), à laquelle on oppose systématiquement, du point de vue de la redondance nécessaire, tant la non-identité des fonctions ou des valeurs syntaxiques-discursives, que la non-identité des valeurs du sens et/ou de signification des sémantèmes, sur le plan de la substance du contenu.

Ainsi qu'on a déjà observé, pareil à chaque discours qui connaît une limite de la communication, implicitement une limite de la réception, le discours pléonastique, que celui tautologique, semble se caractériser à l'aide d'une relative monotonie de surface discursive. Par rapport au régime de la redondance tautologique (positive ou nécessaire), dans le syntagme pléonastique, la saturation complète des valences communicatives et «l'indifférence» relative au registre artistique – que celui (considéré) non-artistique – sont les signes distinctifs d'un évident épuisement inventif du mécanisme de fonctionnement discursif des structures de communication (intentionnelles) dans le régime tautosémantique de la redondance pléonastique (négative).²

Dans le même ordre d'idées, tout aussi relevante c'est la distinction des conséquences lexico-sémantiques et expresives du fait que le «*tautosémantisme*»

¹ On s'est arrêté sur ces problèmes dans une étude antérieure, dans l'ordre de l'investigation du progrès tautologique de sens (cf. Breaz, 2007: 141-155, 2007a). On ajoute ici, de nouveau, que, dans la terminologie de la neo-rhétorique générale du *Groupe μ* (1974: 64-65, 123-145, 428, *passim*), la métabole est l'unité fondamentale de la déviation, prise comme écart linguistique par rapport au soi-disant «*degré zero*» du niveau discursif. Dans le cadre du modèle structural de la neo-rhétorique générale élaboré par le *Groupe μ* , tant les *métasémèmes*, que les *métalogiques* s'inscrivent parmi les métaboles logiques qui visent également la substance du contenu, soit dans le domaine de la sémantique (les *métasémèmes*), soit dans le domaine de la logique (les *métalogiques*).

² Cf. Stati, 1967: 165, 166-168, *passim*. Pour le syntagme «redondance nécessaire» et pour toute la discussion sur le rapport entre information et redondance, respectivement entre la redondance «positive», «valide» ou «nécessaire» et la redondance «négative», «fausse» ou «pléonastique», cf., aussi, Marcus-Stati, 1967: 151-178.

ne se situe guère, en effet, parmi les traits «différentielles»³ de la tautologie, mais parmi celles qui peuvent définir ou définissent d'autres figures de la redondance par adjonction répétitive, par exemple, le pléonasma, comme figure de la synonymie lexicale superflue due à la surabondance (inutile) des termes (ce qu'on nomme la redondance «négative»), dans des énoncés du type «tautosémantique, homophones ou heterophones, isomorphes ou opposés».⁴ Si les énoncés tautologiques ne sont, donc, jamais pléonastiques, les pléonasmes⁵, au contraire, sont toujours des énoncés tautosémantiques, parce que le pléonasma vise la *synonymie* lexico - sémantique et syntaxique, tandis que la tautologie appartient à la *homonymie* lexico-sémantique et syntaxique⁶.

Avram⁷ considère que les phénomènes linguistiques désignés par les deux termes – le pléonasma et la tautologie (comme synonymie partielle) – se ressemblent et se confondent parfois à la redondance, dans le sens négatif – antérieurement mentionnée – comme surplus d'information dans la communication et, particulièrement, dans le sens de cumul d'éléments («explétifs»⁸) d'expression concernant la présentation d'un contenu, précisant qu'aux phénomènes semblables de cette catégorie on pourrait ajouter, d'un part, la *lapalissade*⁹ (affirmation naïve en cercle vicieux), le cliché d'expression («des expressions tout faites») et le *truisme* (une vérité évidente, banale) et, d'autre part, l'*amplification*, la *périphrase*, l'*apposition* et, éventuellement, les *figures de répétition lexicale* diversifiées soit par *dérivation* (le *parigmenon*¹⁰: figure stylistique qui se constitue par la présence, dans une séquence discursive quelconque, de certaines parties du parler nominal ou verbal, ayant la même racine flexionnelle), soit par *flexion* (le *polyptote*¹¹: figure stylistique qui relève la répétition d'un même mot sous diverses formes de la flexion). Malgré le fait que le pléonasma (et la tautologie, à ce sens), la redondance et la répétition sont des phénomènes opposés à l'économie linguistique, réalisables par ellipse ou la brève éloquence, la tautologie fait exception et s'éloigne de la note de prolixité supposée

³ Le syntagme "trait différentiel" (Stati, 1967: 218) désigne des caractéristiques essentielles pour la définition de n'importe quelle unité minimale des systèmes de la langue. Par extension, on peut apprécier que, dans la rhétorique discursive aussi, ce syntagme maintient très étendu son domaine de référence et d'application, étant, aussi, fréquemment utilisé tant par la grammaire rhétorique (la morphosyntaxe discursive), que par la sémasiologie rhétorique, où il désigne les composantes sémantiques essentielles qui sont nécessaires pour délimiter certaines unités lexico-sémantiques.

⁴ Stati, 1967: 223, 235.

⁵ Cf. *Ibidem*: 165-168; 218-223, *passim*.

⁶ Avram, 1996(a): 3-4.

⁷ Avram, 1996: 3-5.

⁸ Les éléments redondants sont nommés parfois "explétifs" (Avram, 1996: 4) (s. n.)

⁹ On nomme "lapalissade" (après le nom du noble français *La Palice* ou *La Palisse*) une proposition ou le sujet et le prédicat disent la même chose avec des mots différents ou une phrase ou les deux propositions communiquent la même idée utilisant des mots différents. Malgré cela, en ce qui concerne l'organisation grammaticale, la *lapalissade* n'a - du point de vue linguistique - aucun trait qui puisse la différencier de toute autre phrase, quelle que correcte qu'elle soit (cf. Graur, 1962: 443; 1970: 61) (s. n.).

¹⁰ "Figura per pleonasmom" (cf. Dragomirescu, 1975: 56-58, pour la riche exemplification réalisée) (s.n.).

¹¹ Cf. *ibidem*: 58-59: Figure de la répétition, encadrée, comme le *parigmenon*, parmi les figures de la répétition lexicale, à côté de l'*antanaclase*, la *diaphore* et l'*annomination* (des figures de la répétition lexicale diversifiées par l'opposition onomasiologique) (s.n.).

– au-delà de son emploi rhétorique – par les phénomènes antérieurement mentionnés: «La tautologie comme phénomène syntaxique et stylistique est seulement de façon apparente une manifestation de prolixité et sans productivité, à la suite du retour trompeux au point de départ discursif; en réalité, elle est, bien au contraire, une modalité d'expression économique, vu que la répétition d'un terme, ayant les caractéristiques décrites, substitue des développements de différentes dimensions.»¹². Malgré cela, de nombreux travaux de spécialité équivalent les termes – et les notions – de *pléonasme* et de *tautologie*, élargissant sans aucun motif les limites d'un cas de synonymie partielle et réduisant, en même temps, la signification de la tautologie seulement à un de ses sens concernant la langue et notamment à celui – *non-spécifique* – qui est identique au sens du terme *pléonasme*. À côté de l'analyse des nombreuses tangences que la tautologie et le pléonasme ont avec d'autres phénomènes antérieurement mentionnés – des cas ou des manifestations de la prolixité – Avram¹³ précise aussi les critères qui permettent la distinction entre le pléonasme et la tautologie: (1) *le critère étymologique* (dans la structure du terme *tautologie* on reconnaît des éléments de composition savante qui indiquent l'identité de l'expression des termes où s'établit la relation tautologique), (2) *le critère sémantique* (la monosémie du pléonasme s'oppose évidemment à la polysémie de la tautologie) et, finalement, (3) *le critère stylistique*: tant le pléonasme, que la tautologie sont des variétés de la répétition, une répétition sémantique – dans le cas du pléonasme¹⁴, respectivement une figure stylistique – dans le cas de la répétition tautologique. D'ailleurs, comme *phénomène syntaxique*, la tautologie est considérée une variété de la répétition¹⁵, une répétition de type spécial (*la répétition d'un mot avec une intonation et une fonction syntaxique différentes ou ressemblantes, dans la même proposition ou dans une autre proposition*¹⁶), et comme figure stylistique, elle est située dans le groupe des figures de la répétition: «figure, dans la proposition et dans la phrase, qui se caractérise par la répétition du mot sujet ou prédicat ayant une autre fonction grammaticale, répétition qui entraîne la subordination du mot sujet à lui-même, devenant ainsi un terme de sa propre détermination (stylistique). Le schéma de cette figure est, en général: $x = x$ »¹⁷.

¹² Avram, 1996a: 5.

¹³ Avram, 1996a: 3-4 (s.n.).

¹⁴ «Le pléonasme est lui aussi relié à la répétition: dans certains de ses types on se produit une répétition proprement-dite, réalisée dans la même forme (pour certains pléonasmes grammaticaux) ou sous une forme différente, de la sphère de la flexion (...) ou de la formation de mots; dans d'autres types, il s'agit de ce que certains chercheurs nomment répétition sémantique, réalisée à l'aide des éléments différents comme expression» (Avram, 1996a: 4).

¹⁵ «A ce qu'on a observé, dans son acception de phénomène syntaxique à valeur stylistique, la tautologie est par définition (et par l'étymologie du terme) reliée à la *répétition* (...) Le spécifique de la tautologie par rapport à d'autres répétitions est donné par la prononciation différente – comme intonation et accent syntaxique – de ses termes; négliger ce spécifique peut engendrer dans la lecture orale la modification du sens, par la confusion avec des répétitions ayant d'autres valeurs (par exemple, une valeur énumérative) ou avec une expression en cercle vicieux» (Avram, 1996a: 4).

¹⁶ Cf. Constantinescu-Dobridor, 1980: 420 (s.n.).

¹⁷ Dragomirescu, 1975: 61.

Avram¹⁸ observe, aussi, que, des deux sens concernant la langue, l'un, qui représente l'acception récente du terme *tautologie*, est *non-spécifique*, coïncidant avec le sens du terme *pléonasme*¹⁹, tandis que l'autre est spécifique²⁰, ce qui fait que la situation actuelle du terme *tautologie* soit «d'autant plus étrange, que ses deux sens concernant la langue désignent des phénomènes *exactement opposés*: (a) l'expression, d'habitude, à l'aide d'autres mots, dans le cas du sens identique à celui du terme pléonasme, par rapport à (b) l'expression à l'aide des mêmes mots, dans le cas du sens spécifique»²¹. À partir de la définition syntaxique classique de la tautologie, proposée par Graur («une proposition ou une phrase où on établie une relation grammaticale entre deux termes – des parties de propositions ou des propositions entières – qui ont le même sens et on les exprime à l'aide des mêmes mots»²²), définition consacrée aussi dans le *GLR* (1966), que dans le *DER*²³ et reprise correctement par le *DEX* (1974)²⁴, Avram assimile aussi la définition rhétorique-stylistique de la tautologie – par rapport au pléonasme²⁵ –, pour proposer la plus claire – et la seule complète jusqu' à présent – définition du phénomène de la tautologie par rapport au pléonasme: «Par *tautologie* on comprend de cette manière un phénomène syntaxique et stylistique, respectivement la construction et la figure stylistique qui se réalise à l'aide de la répétition d'un mot ou d'un groupe des mots à fonctions grammaticales différentes et à intonation différente. Ce sens du terme *tautologie* a de son côté aussi l'étymologie du mot, dans la structure duquel on reconnaît les mots grecs, utilisés comme éléments de composition savante, *tautos* «le même» et *logos* «mot», tandis que l'utilisation comme équivalent du terme de pléonasme est contraire à l'étymologie, dans la mesure où, le plus souvent, le pléonasme se réalise à l'aide d'éléments (et, implicitement, à l'aide de mots) différents»²⁶.

¹⁸ Avram, 1996: 3-5.

¹⁹ "L'erreur de langue qu'on perçoit dans la répétition de la même idée, formulée à l'aide d'autres mots; cercle vicieux, pléonasme." (*DEX*, 1975: 940) (s.n.).

²⁰ "La tautologie est une répétition de type spécial; elle se réalise par la répétition d'une partie de la proposition ou d'une autre proposition à l'aide des mêmes mots et avec le même sens, mais à fonction syntaxique différente.(...) Entre les deux éléments de la répétition tautologique on peut trouver des différences formelles, d'articulation, de mode, de diathèse ou de personne. On peut trouver aussi des différences d'intonation" (Contraș, 1966, [in] *GRL*, 1966, II: 415, s.n.).

²¹ Avram, 1996a: 3 (s.n.).

²² Graur, 1962: 443.

²³ Cf. *DER*, 1966, IV: 614.

²⁴ Cf. *DEX*, 1975: 705, 940.

²⁵ "T. [la tautologie, n.n.] ne doit pas être confondue au pléonasme, à la manière de la plupart des auteurs modernes (Ex. *Meyers handbuch*, Morier et d'autres). La définition correcte, à l'aide d'exemples, qui différencie le pléonasme de la t. et vice-versa, nous l'offre Quintilian, comme il s'en suit: tandis que le pléonasme est "l'addition d'un mot superflu" ("adiectio unius verbi supervacua"), t. est la répétition d'un même mot ou expression ("eiusdem verbi aut sermonis iteratio"). On peut donner le suivant exemple pour le pléonasme: "ego oculis meis vidi" (Vergilius), et comme exemple pour t.: "non solum igitur illum iudicium iudicii simile, iudices, non fuit"(Cicero)" (Dragomirescu, 1975: 62).

²⁶ Avram, 1996a: 3.

Lorsqu'il résumait l'approche linguistique de la problématique de la tautologie (d'une perspective grammaticale), Graur²⁷ commençait d'une série de prémisses analytiques-discursives antérieurement formulées, du point de vue théorique, par Wald, qui, combattant la théorie du positivisme logique²⁸ (selon laquelle *la tautologie ne communique rien de nouveau*), observait que la pensée «ne s'arrête pas», qu'elle «ne revient pas à son point de départ», mais au contraire, qu'elle «avance» même dans la plus inexpressive tautologie. La logique symbolique – observe Wald – admet un certain «*mouvement de la pensée à l'intérieur de la tautologie*», mais elle le reconnaît comme tel seulement dans le domaine du métalangage, en le considérant «parler du parler» et non pas «parler sur la réalité»: «La tautologie est, en effet, une proposition où la même notion existe aussi comme sujet et comme prédicat, peu importe si on utilise ou non le même mot. La proposition "la vérité est une idée véridique" n'est moins tautologique que la proposition "les actes sont des actes". Cependant, la tautologie ne se ressent pas de la manque de quelque contenu réflexif. (...) Dans une tautologie, la pensée ne reste pas immobile, elle ne s'arrête pas, elle ne revient pas à son point de départ, mais avance du sujet au prédicat, réussissant ainsi à refléter l'unité entre la *quantité* des choses du même genre et leur *qualité* générale, entre l'individuel et le général, entre la différence et l'identité.»²⁹ D'ailleurs, ni la définition linguistique de la *tautologie* (*la définition par soi-même, utilisée aussi pour obtenir de subtils effets expressifs*) ne contredit pas celle de la logique, où la tautologie est un jugement où le *sujet* (*notion, concept*) est identique à la sphere de la notion (les attributs du concept). Par conséquent, dans le discours logique aussi, la tautologie se manifeste par le fait que l'énoncé donné comme explication ou comme preuve se limite à répéter dans des termes identiques ou quasi-identiques ce qu'on a affirmé tout d'abord (de cette façon, au moyen de la tautologie, naissent, parfois, des sophismes comme le *cercle vicieux* ou *petitio principii*). Malgré cela, vu qu'elle représente les propriétés fondamentales des opérateurs logiques, comme reflet de certaines connexions réelles d'une généralité absolue, respectivement d'une haute validité³⁰, on admet (Klaus, 1977) que la tautologie est la «forme judicative» inévitable de toute notion: «Toute notion est une tautologie

²⁷ Graur, 1962: 443-449.

²⁸ “On doit préciser avant tout ce qu'on comprend – tant dans la logique symbolique (mathématique), que dans la sémantique logique – par *tautologie* ou *identité logique*: il s'agit d'une expression où des lettres apparaissent et indiquent des propositions reliées à l'aide des connecteurs logiques et qui est toujours vraie, donc qui a toujours la valeur *A*, quelles que soient les valeurs de vérité des propositions qui y interviennent. Ainsi, les tautologies qui se vérifient immédiatement sont connues d'habitude sous le nom du *principe du tiers exclu* (une affirmation est soit vraie, soit fausse) et sous le nom du *principe de la non-contradiction* (une proposition et sa négation s'excluent réciproquement). Si dans une tautologie on interprète les lettres comme les indicateurs des formes propositionnelles, on obtient une expression vraie quelle que soit la forme propositionnelle qui se substitue aux lettres et quel que soit l'élément du rassemblement universel qui représente la variable.” (Wald, 1970: 53-54).

²⁹ Wald, 1970: 53-54.

³⁰ Klaus, 1977: 331.

enveloppée; toute tautologie est une notion développée. La notion se transforme en tautologie au moment où son contenu est affirmé par sa sphère³¹. Dans toute tautologie, en fin de compte, la notion est exprimée par sa sphère, et, réciproquement, la sphère de la notion est la notion même.

On remarquait, dans une approche antérieure³² de la problématique de la rhétorique cognitive³³, que le mécanisme psycholinguistique de la tautologie³⁴, dans le sens d'*abstraction réflexive* (Piaget)³⁵, attribué à la suite de l'observation de sa fonction réitérative, contrôle les manifestations des prédispositions cognitives et affectives (innées) actualisée – par le soi-disant «organ mental du langage»³⁶ – au niveau discursif, où il les dirige et les conduit d'une marche à l'autre, sur l'échelle des généralisations inductives³⁷. Par conséquent, le nouveau prédicat prendra contour chaque fois, tant dans la sphère du sujet de la tautologie (dans les énoncés propositionnels), que dans les termes des prédicats tautologiques antérieurs (au niveau phrastique), remodelant toujours l'énoncé du point de vue sémantique (par *addition*) et stylistique (par *déviatio*n) et mettant en relief des connexions intra- propositionnelles et inter- propositionnelles toujours vraies.

À la suite des reconsidérations générativistes de Chomsky³⁸, on a pu observer qu'aussi, dans le sens large, - "pas dans le sens technique de «vérité logique», mais dans le sens habituel, de «vérité évidente»" – que, dans le sens restreint, la tautologie est l'une des manifestations discursives importantes du «langage de la pensée» (Fodor, 1975, 1988), pas tellement dans l'acceptation stricte de «*définition circulaire*», quoique la

³¹ Wald, 1962: 8.

³² Breaz, 1997: 37-43; 2007a.

³³ Cf. Dan Sperber, *Rudiments de rhétorique cognitive*, [in] *Poétique*, 23 (1975), p. 389-415.

³⁴ A retenir les observations perçantes de Hilary Putnam (1988: 498-499) sur la "tautologie" de Fodor, dans le chapitre 14 (*Ce qu'il y a d'inné et pourquoi. Des commentaires sur le débat*) de THÉORIES (1988: 477-510). La tautologie en discussion soutient qu'aucune connaissance n'est possible – «Il n'est pas évident ce qu'il y a d'évident» (George Kreisel, cité par Putnam, 1988: 556) – si les hypothèses et les concepts ne sont pas déjà dans la pensée du sujet universel de la connaissance, c'est-à-dire *avant* qu'une chose soit observée. En acceptant cela, on trouve aussi légitime la postulation de l'idée que la *source* des concepts et des hypothèses est innée.

³⁵ Piaget (1972: 202; 1988: 489) comprend par "*abstraction réflexive*" un modèle de structuration conceptuelle; celle-là "reconstruit sans cesse sur les plans supérieurs ce qui s'extrait d'actions ou d'opérations des niveaux antérieurs et qui constitue la modalité naturelle générale de la formation des structures" (Piaget, 1972: 202).

³⁶ Chomsky, 1988: 533.

³⁷ "[Piaget] considère comme donnée l'«*abstraction réflexive*»; elle n'existe pas «avant le langage» étant celle qui nous mène d'une marche vers la marche suivante. «Le reflet» et «l'abstraction», n'ont, cependant, *aucun sens littéral au-delà du langage!*" (Piaget, *apud* Putnam, 1988: 498). En commentant la manière du débat entrepris par Putnam sur les idées de Piaget, Chomsky utilise le syntagme «*abstraction réflexive*», pour désigner la même réalité psycholinguistique: «Une chose vaut la peine, cependant, d'être mentionnée. Putnam considère que l'approche de Piaget est presque identique à la mienne, dans le sens que la notion d'«*abstraction réflexive*» est reliée à l'utilisation du langage dans l'inférence» (Chomsky, 1988:531).

³⁸ Chomsky, 1988: 532.

dernière est spécifique pour n'importe quel message autoréférentiel, mais surtout dans l'acception plus souple et plus colloquiale de «*vérité évidente*»: «Finalement – précise Fodor – “la tautologie employée dans les discours n'a pas, de manière très évidente, le sens de vérité logique, mais celui de vérité manifeste, une vérité évidente en soi...etc.”»³⁹ De plus, on sait que, dans des sens restreints très spécifiques, la tautologie est exploitée aussi par la logique formelle, par exemple, dans les cas des définitions implicites à travers un système d'axiomes: “Dans le cas des axiomes, les cercles vicieux peuvent apparaître seulement sous forme de tautologies, qui du point de vue du contenu, n'apportent aucun préjudice, et qui, du point de vue formel, sont les formes concrètes au moyen desquelles apparaissent les lois de la logique”⁴⁰.

En outre, les tautologies ne représentent pas des définitions circulaires proprement- dites; *petitio principii*, précisait Marga, est, certes, une erreur à la base de la démonstration («une erreur formelle qui apprécie que la thèse à démontrer est appuyée sur des arguments invoqués pour son insu»⁴¹), mais ce n'est pas cela la situation de la tautologie, parce que, dans le langage naturel, les termes de la relation ne sont pas proprement-dit identiques, mais homonymes, ce qui suppose une identité formelle redoublée par une non-identité au niveau du contenu.

A ce qu'on a déjà remarqué, les soi- disantes «définitions tautologiques»⁴² sont des définitions *eidétiques* ou *conceptuelles*⁴³ d'identification et d'explicitation de certaines propriétés ou caractéristiques de la nature constitutive de n'importe quel objet rhétorique- discursif, de son essence intelligible intrinsèque. À l'aide de la tautologie on émet des jugements intellectuels dont les formes canoniques se réalisent dans des définitions concernant l'essence constitutive de certaines entités conceptuelles qui s'actualisent dans des expressions rhétoriques et discursives similaires ou identiques. La connaissance même ne peut pas être conçue et elle n'est pas possible hors le domaine d'une certaine identité et régularité des éléments de tout objet à connaître. Cette évidence est synthétisée dans le très connu dicton gnoséologique de la tautologie: «*le semblable* («*le similaire*») (*re*)connaît au semblable» («*au similaire*»); autrement dit, l'essence de l'objet cognitif à connaître peut être

³⁹ Fodor, 1988: 535.

⁴⁰ Klaus, 1977: 331.

⁴¹ Marga (*coord.*), 2004: 221.

⁴² Cf. Breaz, 2007a.

⁴³ “Avec Aristote a débuté le *conceptualisme*, qui assume la devise «*universalia in rebus*», selon laquelle les termes généraux se rapportent aux objets, mais, étant le résultat de quelques opérations, parmi lesquelles l'opération d'abstraction, ils ne sont plus pareils aux objets. Husserl s'est lié au *conceptualisme*, auquel il a ajouté la perspective selon laquelle les termes généraux ne permettent pas leur réduction à des représentations formées sur la base de la perception des objets, car ils contiennent aussi une forme de représentation qui n'est pas sensorielle, mais *eidétique*. Frege a proposé l'interprétation des termes généraux comme des *fonctions* (...). L'expression fonctionnelle est un terme général quand ses valeurs possibles sont des valeurs de vérité. Mais Wittgenstein est venu avec une solution différente et il a proposé que les termes généraux soient considérés sous l'aspect de leur signification, et que la signification soit interprétée comme l'*emploi du terme respectif* (...). *Les termes généraux se réfèrent*, plutôt, à des *classes* d'objets et possèdent un *côté conceptuel*”. (Marga-coord., 2004: 61).

reconnue dans l'objet cognitif déjà connu; et inversement, l'objet déjà connu est, potentiellement, l'objet à connaître.

Dans les termes de la rhétorique aristotélicienne, c'est cela l'essence de la fonction conceptuelle de la tautologie. L'identité formelle des termes de la relation tautologique est supposée nécessaire: «parce que les sensibles participent aux *eide* – observe Peters⁴⁴ –, elles doivent en être dénommées (*homonymes*) de la même façon». Les tautologies ne sont pas de définitions circulaires, car la nature homonymique – et non pas proprement- dit identique – des termes de la relation provoque le fait que celui qui définit (le «*definiens*») accepte dans la formule de la définition la présence de ce qu'on a défini (le «*definiendum*»), mais seulement dans les cas où l'identité dénomminative demeure inhérente: «Comme chez Platon, chez Aristote, l'*eidos*, a, du point de vue logique, une étroite relation avec le prédication. L'*eidos* conceptuel est l'universel de la prédication et le sujet de la définition.»⁴⁵ Autrement dit, les tautologies formalisent des structures opératrices dont la circularité ne représente rien de vicieux, mais qui bien au contraire, expriment dans leur formes les plus générales la dialectique *eidétique* du sujet individuel et du sujet épistémologique.

Puisqu'elle actualise au niveau discursif une sous structure innée, élémentaire, essentielle et universelle du «langage de la pensée»⁴⁶, la tautologie, grâce à son contenu «réflexif», représente la principale manifestation d'un modèle auto-organisé capable de générer des structures potentiellement persuasives à la suite de l'effet obtenu de l'emploi intentionnel et dirigé de son action d'autoréglage successif. La tautologie est donc l'un des moyens structuraux les plus employés dont les cas rhétoriques particuliers peuvent être réduits à des opérations autoréférentielles en établissant l'identité ou la confrontation, respectivement l'opposition, la progrès et l'intensification, la concentration, la mise en évidence et l'explicitation des idées, grâce à la réitération des éléments au niveau d'une structure donnée, respectivement à l'intérieur de la «figure répétitive», soit elle immédiate, soit elle à distance, aux effets rhétoriques- stylistiques d'augmentation de l'expressivité parmi lesquelles: l'ironie, l'ambiguïté, la nuance, la parodie, «le relief» sentencieux ou emphatique, l'équivoque, le calembour ou le paradoxe.

Comme nous l'avons précisé auparavant⁴⁷, la tautologie est revendiquée, en même temps, dans le cadre de l'action discursive proprement-dite, aussi comme procédé quantitatif («*la pluralité de la correction*») et qualitatif (*construction répétitive du point de vue structurel nécessaire*) de soulignement syntaxique et de mise en évidence rhétorique et stylistique décrite dans la majorité es oeuvres et des recherches actuelles, ce qui ne signifie que le phénomène de la tautologie a été omis par la manifestation de certains points de vue qui ont eu des effets censurés qui ont conduit à une série – plus ou moins évidente – des confusions.

⁴⁴ Peters, 1997: 78.

⁴⁵ *Ibidem*: 80.

⁴⁶ Fodor, 1975, 1988: 535.

⁴⁷ Breaz, 2007: 104.

Malgré cela, tant les approches traditionnelles (Wald et Graur, 1962; *GLR*, 1966; Dragomirescu, 1975 etc.) du phénomène en discussion, que certains travaux modernes (Constantinescu – Dobridor, 1994; Diaconescu, 1998, 1995; Irimia, 1999; Bidu– Vrănceanu, 2001 et d'autres) situent la tautologie, dans le cadre de la répétition, parmi les procédés syntaxiques à valeur expressive. *GLR*⁴⁸, par exemple, discute sur le problème de la tautologie dans le cadre de la répétition lexicale, en la situant parmi les phénomènes et les procédés syntaxiques – à valeur affective – communs à la proposition et à la phrase, à côté de l'anacoluthie, l'ellipse et les constructions incidentes, mais mettant en relief une série d'éléments distinctifs, spécifiques pour le mécanisme tautologique de l'identification d'une notion par la même notion: la répétition tautologique *renforce* ou *souligne* le caractère véridique, authentique, réel, du premier terme, *authentifie* donc et *confirme* la réalité du terme – base, *indique* et *marque* sans équivoque l'exclusivité de la sphère (co)référentielle désignée par le terme initiale (le sujet de la tautologie) et *met en évidence* ou *met en relief* (grâce au «soulignement insistant» réalisé) *la qualité* évoquée, grâce au second terme de la construction, respectivement le prédicat de la tautologie, qui est l'*interprétant* du terme-base. La répétition peut cependant devenir pléonastique, si le terme repris ne s'est suffisamment éloigné sémantiquement par rapport au premier terme, pour que la reprise – développée entre deux extrémités discursives identiques ou quasi-identiques – devienne expressive et, potentiellement, persuasive.

Dans une étude précédente, où, de la perspective rhétorique des fondements de la figuration discursive, on proposait l'esquisse d'une «poétique de la tautologie»⁴⁹, on considérait, au jugement de Eco (1982), que, les identités formelles spécifiques à la redondance tautologique, comme *surconstance* discursive, représentent, de la perspective «de l'hyper- codage esthétique», la condition structurelle même de la divergence sémantique sur- normative, comme *surabondance connotative*⁵⁰. Conformément à Eco, «toutes les règles rhétoriques et stylistiques qui opèrent en n'importe quelle langue constituent des exemples de hyper- codage. Un code – base établit qu'une certaine combinaison grammaticale est compréhensible et acceptable, tandis qu'une règle rhétorique ultérieure (qui ne nie pas la précédente, mais la prenne comme point de départ) établit que cette combinaison syntagmatique doit être utilisée dans des circonstances spécifiques, avec une connotation stylistique donnée»⁵¹.

On remarquait à cette occasion- là⁵² que, de la perspective du soi-disant «parallélisme tautologique des idées»⁵³, Eco mettait en relief pas seulement un

⁴⁸ *GLR*, 1966: 407-417. Il s'agit du chapitre sur la répétition et du souschapitre sur la tautologie, élaborés par Eugenia Contraș dans la *Grammaire de la langue roumaine (GLR)*, la seconde édition, Bucarest, l'édition de l'Académie de la R.S.R., p. 407-415, respectivement p. 415-417.

⁴⁹ Cf. Breaz, 1997: 37-43.

⁵⁰ *Ibidem*: 41-42.

⁵¹ Eco, 1982: 181 et, d'une manière presque identique, Eco, 2003: 150.

⁵² Breaz, 1997: 41.

⁵³ Alonso Amado, 1987: 333.

«surplus d'expression» dans le plan syntaxique, mais aussi un «surplus de contenu» dans le plan sémantique, identifiant, au-delà d'un apparent excès de normalité et de «quasi-redondance», un inattendu «surcroît» ou «surplus d'information», équivalent au mécanisme même de «l'hyper-codage esthétique»⁵⁴ du texte: «Pourtant, cet excès même de redondance est une déviation par rapport à la norme et entraîne le soupçon que le message est plus ambigu qu'il ne le semble. La sensation qu'à chaque occurrence le mot signifie toujours autre chose transforme le message en texte: parce qu'ici la déviation se produit par rapport à des différents sous-codes, partant de celui botanique et se dirigeant vers celui symbolique et allégorique, ayant comme résultat une formule qui ne correspond à aucune de leurs normes définitoires. Ici l'excès de redondance s'institue aussi au niveau du contenu, mais les deux excès provoquent ensemble un «surcroît d'information».⁵⁵

Nous signalons de nouveau que cette analyse a été reproduite justement parce que, valable encore à présent, elle remet en discussion, selon Eco, toute une tradition de l'interprétation de l'ambiguïté, pour laquelle la tautologie ne représente pas une erreur d'expression (vu que «les règles du code linguistique ne sont seulement respectées, mais réitérées»), mais, au contraire, celle-là traduit une virtuosité stylistique réalisée grâce à un écart «prémédité» de la norme, à une ambiguïté volontaire et à une symbolique allégorique et hermétique de facture maniériste.⁵⁶ La même ambiguïté de manière savante on pouvait la retrouver chez Empson, qui l'encadrait dans la catégorie de l'ambiguïté «non-relevée», «du sixième type, par tautologie».⁵⁷

Nous avons conclu la recherche précisée antérieurement par la présentation des considérations de Plett (1983) sur l'opposition entre la tautologie et le pléonasma, des appréciations toujours valables qu'on reprend ici, pour leur relèvement dans la discussion concernant le rapport entre la redondance positive et la redondance négative. Par conséquent, le soi-disant critère commun de la «redondance» discursive distingue, en effet, une fois de plus, la tautologie du pléonasma, parce que, dans le plan de la discursivité (considérée) littéraire, ce critère conduit vers une autre distinction essentielle, celle qui s'établit entre la structure (considérée) «non-artistique» du pléonasma et la structure (considérée) «artistique» et (hypothétiquement) expressive, au niveau de laquelle on considère la tautologie dans un système de connexions intra/extratextuelles si compliquées, qu'une redondance à un certain niveau cesse d'être redondance à un autre niveau⁵⁸.

Dans l'étude déjà mentionnée, Plett (1983) reconnaissait, à son tour, en ce qui concerne la tautologie, une certaine fonction esthétique en soi, découlant à la fois d'un principe général quantitatif, c'est-à-dire du principe général de l'*addition*, que d'un principe général qualitatif, respectivement du principe général de la

⁵⁴ Eco, 1982: 181.

⁵⁵ *Ibidem*, 1982:342.

⁵⁶ *Ibidem*: 342, *passim*.

⁵⁷ Empson, 1981: 271(s.n.).

⁵⁸ Plett, 1983: 284-286.

sélection. C'est cela la raison pour laquelle, Plett⁵⁹ assimile la tautologie à la fois aux figures de la *déviatio n sémantique* qu'aux figures de l'*équivalence morphologique*, comme «*métasémème additif*» en dépendance directe du contexte. En ce qui concerne la fonctionnalité des figures sémantiques de l'«*addition*» dans les discours (considérés) littéraires et artistiques, tant le pléonasm e, que la tautologie, dans leur qualité de figures de la *déviatio n sémantique* (*des métasémèmes additifs*), se produisent «grâce au fait qu'on ajoute de traits sémantiques ou des complexes de traits sémantiques contrairement aux restrictions sémantiques de la coocurrence»⁶⁰: «Une simple énumération additive d'unités sémantiques – précise Plett – n'est pas encore suffisante pour produire une déviation. Au point de vue quantitatif doit s'ajouter un autre, qualitatif. Une confusion d'une règle sémantique existerait dans la combinaison des signes, où l'un d'entre eux aurait pu contenir tous les signes de l'autre, par exemple, [(x)]+[(x)+(y)]+(+z)]. On pourrait inclure ici le syntagme *Weibliche Frau*, dont la composante *Frau* implique le trait féminin. Une situation pareille on peut la retrouver dans les syntagmes *nain petit, géant immense, human boy* etc. La rhétorique classique parle, dans ces cas, du pléonasm e: un autre terme convenable dans des situations pareilles est celui de «fausse redondance» («*fehlerhafte Redundanz*» - cf. Leech 1969: 137-138). Comme variante syntaxique du pléonasm e est considérée la tautologie».⁶¹

Dans cet ordre d'idées, suivant toujours l'opinion de Plett (1983), nous observons, dans la recherche indiquée antérieurement, que, par opposition au pléonasm e (la simple énumération additive d'unités lexicales qui produit déviation sémantique seulement au niveau quantitatif, pas au niveau qualitatif), où les traits sémantiques d'un mot sont déjà contenus par un autre mot, qui se situe très proche du dernier, ce qui équivale à une «*addition erronément redondante*» d'un sémème, dans le cas de la tautologie («*métasémème d'insertion*»), si – par la pression du contexte – intervient une «*multiplication*» des traits sémantiques du sémème respectif – transformé en métasémème «*d'insertion*», par la présence du même mot réitéré formellement et remodelé pas seulement du point de vue syntaxique, mais sémantiquement aussi, à chaque reprise -, alors «l'erreur sémantique de la tautologie se transforme(...) dans un trope stylistique, l'emphase».⁶²

Toujours dans la descendance de la rhétorique aristotélique, on a signalé aussi, à cette occasion- là, le fait que, à cause de la concision, la tautologie ne s'inscrit dans aucune des directions rhétoriques consacrées de l'amplification emphatique⁶³, définit, individualise et confirme la place unique qu'elle occupe dans

⁵⁹ *Ibidem*: 284, 285-286.

⁶⁰ Bickerton (1969), cité par Plett (1982: 284).

⁶¹ Plett, 1983: 285; Leech 1969: 137-138, *apud* Plett, 1983: 285.

⁶² *Ibidem*: 286 (s.n.).

⁶³ Parmi ces chemins de l'amplification emphatique, les plus connues et les plus "attendues" comme telles sont, dans la rhétorique aristotélique, «les additions d'épithètes» (c'est-à-dire des attributs de sens) obtenus «des privations» (c'est-à-dire sans les exprimer à l'aide de la subordination par rapport du nom régent), les

le tableau des figures rhétoriques de la redondance nécessaire. L'emploi tautologique nu nom pour soi et à sa place se réalise de façon rhétorique -syntaxique par une «conjonction à relations logiques»; l'emphase tautologique parle donc, par des qualités que l'objet (discursif) en cause a *seulement* en relation avec lui-même (il existe comme «signe pour soi»), «parce que de cette manière il s'amplifie à l'infini»⁶⁴. Ainsi, la concision emphatique et non pas l'amplification emphatique ou parasitaire est celle qui caractérise le discours tautologique.

En dehors des distinctions opérées sur le plan des figures répétitives par les oppositions spécifiques de la redondance discursive, une autre distinction entre pléonasme et tautologie, dans le cadre des figures de la déviation sémantique⁶⁵, serait que, tandis que le pléonasme représente un cas de «*déviation, par écart de la règle*» par addition erronément redondante (réalisant dans une séquence combinatoire donnée une transformation sémiotique - syntaxique du type suivant: « $a + b + c \rightarrow a+b+c+d$ »), la tautologie est un cas de «*déviation de renforcement de la règle*», à l'aide d'une équivalence (ou d'une récursivité) qui se réalise dans la suite des signes par la répétition «*totale ou partielle*» d'un ou de plusieurs éléments du signe, selon le schéma récurrent de la suivante formule transformationnelle: « $a+b+c \rightarrow a+b+c+a$ »⁶⁶.

Plett⁶⁷ observait encore le fait que, du point de vue de la similarité du signe, dans le cas de la tautologie, la ressemblance des deux signes peut être *totale* («identité [égalité] de signes: $a1 \equiv a2$. *Cette sous- catégorie n'est possible que pour la relation d'équivalence, où elle décrit la forme pure de la répétition*») ou *partielle* («affinité de signes: $a1 \equiv a2$ ») et que les différences de distribution syntaxique et sémantique, respectivement les différences du niveau suprasegmental excluent la possibilité de la ressemblance confondante entre la tautologie et les «iso- sèmes», qui sont des figures de l'équivalence, et non pas de la déviation sémantique.⁶⁸

Comme on a déjà observé dans d'autres occasions⁶⁹, les notions définies tautologiquement sont exprimées fréquemment par des unités lexico-sémantique nominales qui entrent dans une relation *d'interdétermination congruente*, une catégorie de l'interdépendance rhétorique - discursive extrêmement active et productive, qui caractérise les figures dérivant l'une de l'autre par des transformations circulaires.

L'actualisation – et l'intégration – syntagmatique de nouvelles caractéristiques inter- déterminatives (des attributs nouveaux de sens ou de signification) se réalise ainsi seulement dans le cercle de l'interdépendance morpho- fonctionnelle, où le

épithètes déterminatives - et non pas les épithètes obtenus «des négations» (présenter l'objet comme il ne l'est pas, «parler par des qualités que l'objet en cause n'a pas») - ou l'emploi systématique du pluriel à la place du singulier (Aristote, *La rhétorique*, III, 6, 1408a, dans *idem, La rhétorique*, 2004: 316-317).

⁶⁴ Aristote, *La rhétorique*, III, 6, 1408a, dans *idem, La rhétorique*, 2004: 316-317.

⁶⁵ Plett, 1983: 162-163 (s.n.).

⁶⁶ *Ibidem*: 163 (s.n.).

⁶⁷ *Ibidem*: 164.

⁶⁸ *Ibidem*: 314 (s.n.).

⁶⁹ Cf. Breaz, 2007: 104; 2007a.

maintient de l'expression dans l'aspect de la quasi-identité formelle des termes de la relation est intentionné et se constitue comme une manifestation de cette inscription circulaire, représentant à la fois une formule délibérée de l'insistance (auto)référencielle. Etant donné le fait qu'on suppose que la nature de cette inscription circulaire doit être à la fois d'ordre lexico-sémantique, que de nature expressive, l'un des problèmes les plus discutés, dans le cas des rapports synchroniques que les lexèmes nominales secondes entretiennent avec les lexèmes- base, est justement s'il se produit, en effet, une différenciation sémantique qui, validant la redondance comme positive au niveau du progrès du sens, puisse permettre le maintien de la tautologie dans le tableau des figures rhétoriques - discursives à valeur expressive et stylistique. Malgré cela, on considère que le problème de la différenciation sémantique ne se réduit pas à *ce* qu'exprime de plus le terme second par rapport au premier, mais plutôt à *la manière* dont le premier terme exprime différemment le renvoi à la référence commune, par l'intermédiaire des sens catégoriels (des sens différenciatifs) et extra- catégoriels, respectivement dans la *nature* de la différence ou de la distinction catégorielle entre les deux termes de la relation tautologique.

Le terme second de cette relation se distingue, ainsi, du terme-base non pas seulement par la modalité de la caractérisation qualitative, mais aussi par le contenu sémasiologique des attributs exprimés, des traits permanents ou permanents différents, incluant le sens catégoriel, typique, direct et différenciatif, à côté de nombreux sens particuliers, extra- catégoriels. Du point de vue de la modalité et de la nature de la caractérisation qualitative, la sémantique des syntagmes tautologiques nominales se développe progressivement, du terme- base vers le terme second, par des additions et par des différenciation connotatives implicites, en accord avec le modèle discursif spécifique de la tautologie, avec sa dynamique distributive et répétitive spécifique. Par conséquent, ces différenciations ou progressions de sens implicites ultérieures, des chaînes associatives de valeurs sémantiques et expressives supplémentaires, s'actualisent seulement par corrélation avec la progression répétitive – la récurrence – de la structure tautologique et directement proportionnel au numéro de reprises, ce qui consolide le statut de *formant figuratif* de la répétition tautologique. Ainsi, on peut apprécier de nouveau que la redondance tautologique n'est pas superflue, mais nécessaire au progrès de sens visé par l'ordre rhétorique et discursive. Cela c'est une des plus significatives raisons discursives qui permettent la compréhension des constructions tautologiques comme des figures de la différenciation sémantique et expressive.

D'autre part, on observe encore une fois que l'évidence de l'interdépendance corrélatrice n'entraîne pas automatiquement la possibilité de la substitution réciproque, en sens absolu, parce que la relative approche lexico-sémantique (seulement à la base de l'équivalence morphologique) des termes ne représente pas – et ne peut pas représenter – une équivalence logique et notionnelle proprement-dite ou absolue et, d'autant moins, une équivalence syntaxique ou sémantique - expressive (à causes des fonctions et des valeurs différentes respectives). La

relation de (relative) équivalence structurelle (formelle) de la tautologie (la double implication tautologique), comme relation particulière d'ordre totale, est, en effet, une relation binaire biunivoque de «*pré-ordre*», caractérisant, à l'aide des propriétés générales – de réflexivité, de transitivité et de relative symétrie – des relations universels d'équivalence, le stade conceptuel de «*pré-formation*» tautologique par lequel les processus intellectuels d'acquisition passent obligatoirement (les appropriations cognactives) dans le domaine de la pensée rhétorique - discursive.

Dans la rhétorique traditionnelle, aussi comme dans la logique formelle, dans la logique mathématique, dans les sémantiques cognactives, dans la psychologie cognitive ou dans la philosophie du langage, la tautologie est une expression dans laquelle, le plus fréquemment, apparaissent certaines lettres (*aa'*, par exemple, comme éléments associés à une relation binaire ou de correspondance) qui indiquent des parties de certaines propositions ou des propositions reliées à l'aide des connecteurs de la double implication ou de l'équivalence (\Leftrightarrow), expression qui est toujours vraie, donc qui a toujours la valeurs conventionnelle *a*, peu importe les valeurs de vérité des parties de proposition ou des propositions qui interviennent dans la relation.

De la perspective du rapport conceptuel entre les catégories de la redondance discursive, on a été intéressé surtout aux tautologies qui peuvent se schématiser sous la forme de certaines dualités du type aRa' , respectivement $a\Leftrightarrow a'$, où les successeurs *a* et *a'* sont des parties de certaines propositions associées dans une relation binaire, qui, à base de la double implication, conduit vers une équivalence entre les parties ou les termes des dualités en cause. L'essence intellectuelle de ces dualités rhétoriques - discursives est que, bien que les parties gardent toujours les mêmes valeurs de vérité, elles n'imposent pourtant la même interprétation des valeurs de vérité respectives. Pour la symétrie, on doit ajouter encore qu'il y a des dualités tautologiques non- interprétables, qui se vérifient immédiatement, vu que leurs termes gardent toujours les mêmes valeurs de vérité; ces dernières sont connues sous le nom du *principe du tiers exclu* (principe qui énonce que de deux propositions ou affirmations contradictoires, l'une est vraie et l'autre est fausse) et, respectivement sous le nom du *principe de la noncontradiction* (une proposition et sa négation s'excluent réciproquement).⁷⁰

Les tautologies sont des paires ordonnées d'éléments associés dans une relation binaire, l'une des principales modalités où la pensée discursive ordonne les concepts. Grâce à leurs propriétés de réflexivité, de symétrie et de transitivité, les relations binaires tautologiques, comme relations d'équivalence, sont des relations universelles (toujours vraies) et réversibles, où, substituant, en relation inverse, l'*a* et l'*a'* entre elles, les deux énoncés qui en résultent ne conduisent pas aux relations différentes: $aRa' \Leftrightarrow a'Ra$. Il y a de nombreux types de relations binaires caractérisées par des propriétés générales et particulières de l'équivalence – ou de

⁷⁰ Cf. Wald, 1967: 148, 200; 1970: 13-14, 53, 54; Marga, 2004: 61, 49, 221, *passim*.

la double implication – rhétorique - discursive. Les congruences, les correspondances, les coïncidences, les analogies, les similarités, les parallélismes et – bien évidemment – les identités – surtout les identités symétriques, qui satisfassent au plus haut degré les propriétés générales de commutativité – sont seulement quelques compartiments de la relation d'équivalence pour laquelle le connecteur logique de la double implication (\Leftrightarrow) représente l'équivalent logique, mathématique et philosophique de la copule comme élément d'une inter- relation linguistique figée.

Les tautologies se retrouvent à leur tour parmi les types de relations binaires produites à la base des relations (universelles) de (relative) équivalence, comprenant par cela toute relation réflexive, symétrique et transitive. La relation de (relative) équivalence tautologique est aussi une relation particulière d'ordre, réflexive et transitive, mais pas parfaitement symétrique. Ainsi, le couple ordonné d'éléments de la tautologie met en relief une relation d'ordre de type particulier, où le premier élément de la relation tautologique est un terme *minimal* (qui ne précède directement tous les autres, mais qui précède seulement le second terme, comme terme maximal, et qui, comme limite de gauche de la chaîne discursive, n'est pas précédé par aucun élément), et où le terme second est un terme *maximal* (qui ne suit pas à tous les autres, mais seulement à l'un d'entre eux, à celui *minimal*, avec qui il est interchangeable, autrement la relation ne serait pas réversible du point de vue formel aussi). En conséquence, la relation d'équivalence tautologique, comme relation particulière d'ordre totale (pas dans le sens strict), est, en effet, une relation de «*pré- ordre*» caractérisant, par ses propriétés de réflexivité, de transitivité et de relative symétrie, le stade conceptuel de «*pré- formation*» tautologique que tout processus d'acquisition de la pensée discursive subit.

Vu que les éléments *minimal* (*a*) et *maximal* (*a'*) se suivent dans un ordre circulaire, on peut mettre en doute la compréhension de la relation tautologique en termes de conséquence, respectivement comme une simple disposition des éléments consécutifs, parce que les éléments du couple tautologique ne sont pas des termes consécutifs proprement-dits, en identité symétrique absolue, mais des successeurs qui se correspondent, sans qu'ils coïncident totalement. Dans un rassemblement tautologique bien ordonné, on nomme successeur d'un élément premier (ou *minimal*) l'élément second (ou *maximal*), comme élément unique qui suit à l'élément premier respectif et qui se constitue et fonctionne comme terme de «l'accumulation» rhétorique-discursive. Un couple tautologique ordonné est, ainsi, une configuration discursive totale de type circulaire, respectivement une structure des successeurs interdépendants et interchangeables (où *a'* suit à *a*, et *a* peut suivre à *a'*).

D'autres aspects de l'interdépendance tautologique visent les possibilités corrélatives de commutation biunivoque (ou plurivoque) spécifiques à la distribution complémentaire. Ces possibilités sont à la fois le résultat de la concentration et de la complexité des corrélations qui caractérisent l'interdépendance et produisent, à leur tour, une autre concentration et une autre complexité, toujours de nature structurale et fonctionnelle, respectivement dans la forme de l'expression et dans le contenu

sémantique *différentiel* des syntagmes, qui, par conséquent, deviennent de plus en plus condensés ou comprimés, donc plus concis et, grâce à ce mécanisme discursif, plus efficaces et plus convaincants. Cette efficacité persuasive et supérieure est, finalement, l'effet concerté de la consolidation progressive de la forme de l'expression discursive, du schéma discursif tautologique, d'une part, et d'autre part, elle est le résultat de la concentration progressive du noyau du contenu sémantique différentiel à chaque répétition nouvelle de la même expression, dans une relation distributionnelle dont la complémentarité génère des chaînes de commutations tautologiques biunivoques (et plurivoques) des termes. Même le fonctionnement syntaxique et discursif de la tautologie se base tant sur l'existence de ce type distributionnelle de haute économie discursive, que sur le niveau élevé d'abstractisation des formations discursives réalisées. C'est cela la raison pour laquelle sa principale fonction syntaxique- discursive n'est seulement de caractériser un objet discursif se référant à lui-même (fonction commune de tous les discours spéculatifs, circulaires, autoréférentiels etc.), mais, surtout, de servir à la communication persuasive par l'intermédiaire des moyens linguistiques les plus abstraits et les plus concis.

Le principe de l'économie, nommé parfois le principe de la simplicité ou de concision, peut offrir l'observation que, dans l'ordre d'idées précisé antérieurement, en ce qui concerne la concision emphatique de type tautologique, l'économie discursive ne devrait pas s'expliquer nécessairement par «moins et non pas plus», mais, plutôt, «moins nombreuses utilisations non- productives»⁷¹, ce qui souligne la nécessité de la reconsidération du rôle discursif de l'économie linguistique et dépasse le lieu commun représenté par la soi- disante contradiction entre l'information et la redondance,⁷² d'une part, et entre «l'excédent» de la parole et l'économie de la langue, d'autre part. Dans la grammaire rhétorique, les accumulations lexico-sémantiques produites par la manifestation tautologique de la différence dans l'identité semblent se réaliser selon les mêmes règles qui, dans la grammaire linguistique, marquent le rapport interactionnel (l'invers proportionnel) entre l'économie linguistique et le minimum effort, d'une part, et le surplus lexico-sémantique, d'autre part. Autrement dit, on oppose à la tendance locutive de communiquer seulement le minimum nécessaire (concentration lexico- sémantique maximale dans les conditions discursives spécifiques à l'économie linguistique) la réaction d'obtenir un maximum d'information, toujours avec un minimum d'effort, réaction qui, dans des termes intentionnels, est le résultat du conditionnement rhétorique, respectivement l'effet de l'efficacité persuasive de l'action rhétorique- discursive, relevable sur le plan du progrès du sens et des différenciations sémantiques et expressives enregistrées dans la sphère de la signifiante persuasive, comme résultat des accumulations lexico-sémantiques et, évidemment comme effet de la surabondance connotative.⁷³

⁷¹ Cf. Marcus- Stati, 1967: 175, 178; Martinet, 1970:227.

⁷² Marcus- Stati, 1967: 151-178.

⁷³ Cf. Halliday, 1961: 241-292; 1963: 5-15.

Le cas particulier d'interdétermination comme «appartenance» ou attribution de sens (et/ou signification) à l'aide de la distribution complémentaire ou équipollente que la construction tautologique illustre est surprenant surtout par le fait que les termes de la tautologie, grâce à la fonction eïdétique⁷⁴, reflètent des degrés d'individualisation – et de cognoscibilité – toujours différents. Ainsi, si les termes premiers expriment une appartenance de sens strictement déterminée par les composantes de la norme lexico-sémantique (les diverses valeurs de l'attribution, l'origine, la provenance, des diverses valeurs partitives etc.), les termes seconds expriment, en compensation, par l'identification eïdétique de la ration unique, dans le sens de valeur catégorielle, une appartenance de sens comme référence à une classe d'objets. En rendant possible la transmission – et la définition – du contenu d'un objet rhétorique- discursif se référant à lui-même, la norme rhétorique- syntaxique (sur)détermine la norme lexico-sémantique et permet la production des certaines valeurs sémantiques surnormatives. Justement sur le plan de ces distinctions il est possible de réaliser l'analyse rhétorique- expressive du progrès de sens et la caractérisation de ce cumule de signification qui s'enregistre partant des termes tautologiques premiers vers les termes seconds des constructions de ce type. Cette permanente actualisation de l'invariante sémantique – la détermination d'un objet par référence à lui-même – est, d'ailleurs, celle qui, par les desiderata de l'expression de la permanente identité avec soi- même, situe la tautologie entre «*les universaux du langage*»⁷⁵.

Dans cet ordre d'idées, on souligne que, à côté du caractère universel du rapprochement du déterminant au déterminé, par exemple, ou à côté du caractère universel des lois phonétiques de la phonologie générale («phonological universals», Jakobson, 1963, 1968), il est généralement accepté aussi le caractère universel de l'interdépendance (le cas de l'inter- détermination congruente par l'intermédiaire de la distribution complémentaire ou équipollente), comme actualisation des mêmes invariants, mais par l'interdétermination des objets ou par la détermination de certains objets par eux-mêmes, comme des objets de la référence médiata, dans le registre discursif de l'autoreprésentation tautologique. L'inclusion de la tautologie dans la catégorie de ce dernier cas caractérise la manifestation d'un «*universel de la redondance*» comme interdépendance circulaire congruente, ce qui situe la figure tautologique, comme «procédé d'expression», tant parmi «*les universaux matériels*», que parmi «*les universaux sémantiques*» (Coşeriu, 1994, 1995, 1996), comme «*des universaux du langage*» (Greenberg, 1963; 1966) ou comme «*des fondements du langage*» (Jakobson, 1963).

⁷⁴ La fonction eïdétique est, dans la rhétorique aristotélique aussi, une fonction d'individualisation, de matérialisation, c'est-à-dire de relèvement d'un objet dans une chaîne d'objets identiques (Cf. Peters, 1997: 78-80; Marga-coord., 2004: 61).

⁷⁵ “Near - universals” (“presque universaux”) ou «fundamentals of language» («des fondements du langage»), pour R. Jakobson (1963, 1968), «universals» (“universaux”), pour Greenberg (1963: 73; 1966: 67) ou pour Coşeriu (1994, 1995, 1996) qui, de la perspective du contenu lexico-sémantique différentiel, distinguait entre les soi - disants “universaux sémantiques” et les “universaux matériels”, comme des “procédés d'expression”.

En même temps, toujours grâce à l'intensification par l'insistance répétitive⁷⁶, tant les figures de la redondance tautologique proprement-dites, que les figures de la redondance quasi-tautologique ou pseudo-tautologique entraînent, selon le cas, un considérable *surcroît* ou *surplus* d'expressivité, généré par la différenciation sémantique réalisée au niveau de la signifiante répétitive comme *équivalence relativement symétrique* (dans l'expression), respectivement comme *équivalence (relativement) asymétrique* (surabondance connotative, «expansion» sémantique, «divergence» sémantique etc.)⁷⁷ dans la sphère du sens et des significations. En effet, les termes seconds des constructions tautologiques, comme des équivalents relatifs des premiers, semblent, parfois, coïncider à leurs correspondants comme termes-base ou termes premiers, cependant, même dans le cas de leur coïncidence formelle (quand on ne s'enregistre pas des différences de forme flexionnelle), les termes premiers et les termes seconds ne coïncident, au fond, complètement et ils ne sont pas, en réalité, identiques, ni par la sphère des sens et/ou des significations, ni par les fonctions accomplies et d'autant moins par leur exploitation attentionnelle (expressive) ou intentionnelle (persuasive).

Dans la grammaire rhétorique, la redondance tautologique est l'un des principaux moyens de la surconstance discursive qui, grâce aux possibilités corrélatives de commutation plurivoque, qui est spécifique aux rapports de distribution complémentaire à inclusion (ou d'équipollence), permet le développement des valeurs sémantiques surnormatives, en fonction des buts rhétoriques et des conditions communicatives de l'énoncé. La progression (ou l'émergence) multiplicative de sens, favorisée ainsi est un cas de surabondance connotative, qui résulte de la pression des accumulations lexico-sémantiques spécifiques de la répétition tautologique comme équivalence biunivoque.

En utilisant – approximativement – *le même* matériel rhétorique et discursif (l'identité tautologique de la base de nomination), qui, par cumule répétitif, acquiert progressivement toujours d'autres fonctions rhétoriques- syntaxiques et des valences sémantiques et expressives, le régime de la redondance nécessaire, qui définit le spécifique de l'occurrence tautologique, devient l'équivalent de l'économie rhétorique- linguistique comme régime de l'exploitation productive, efficiente et persuasive.

⁷⁶ Une investigation complète sur la répétition comme phénomène lexical, sémantique et grammatical, dans la langue roumaine actuelle, on peut retrouver chez Diaconescu (1989, V. 4: 184-206), pour lequel, «analysée du point de vue des relations et des moyens d'expression qui la génèrent, la répétition connaît deux réalisations distinctes: la répétition intégrée structurellement, dénommée *répétition lexicale*, et la répétition nonintégrée, générée par un rapport spécifique à l'apposition, dénommée *répétition appositionnelle* (ibidem: 205); pour les délimitations opérées entre les tautologies comme manifestations de la répétition lexicale, déterminée par des facteurs de nature syntaxique et rhétorique-stylistique, et toute une série de manifestations «pseudo-tautologiques» ou «quasi-tautologiques», assimilables à la même interprétation ou «traduction» d'une base de référence, de la perspective de l'intensité de la signification par insistance, voir, principalement, les paragraphes 4.1.2. – 4.1.4.:185-186; 4.6.3.: 194; 4.8.: 198 et 4.11.: 205-206.

⁷⁷ Mândrescu, 1988: 10, 11.

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**THE AVANT-GARDE AND THE PSYCHOLOGY OF THE
“ARTISTIC REEDUCATION”. A STUDY ON THE
CONFRONTATION BETWEEN THE ROMANIAN HISTORICAL
AVANT-GARDE AND THE SOCIALIST REALISM IDEOLOGY**

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ZUSAMMENFASSUNG. Vorhut und der Psychologie des „künstlerische Nachausbildung“. Eine Forschung über die Gegenüberstellung zwischen rumänischer geschichtlicher Vorhut und die Ideologie des sozialistischen Realismus. Die Forschung beobachtet inwiefern haben die Vorhutskünstler aus Überzeugung zum Realismuslehrsatz und Möglichkeiten wodurch diese übersichtlich zu einer solchen ideologischen “Umwandlung” im Rahmen des “künstlerischen Nachbildungslehrplanes” von der Mitte des vergangenen Jahrhunderts gezwungen, eingewilligt. Damit wir am Ende ein Wiederlesen der Ideologie des sozialistischen Realismus von der Aussicht des Einfalls der “Humanisierung der Kunst” und deren Entdeckungsrichtung der Sozialverwandlungen leisten sollen, haben wir zu diesem Zweck in allgemeinen Richtungen “den Lehrplan” des sozialistischen Realismus, die Möglichkeiten der ideologischen Leitung der Kunst, die Ursachen der Spannungen zwischen der Gesamtmacht einerseits und die Künstler des geschichtlichen Vorhutes andererseits bestimmt. Bei diesem Niveau wurde die verhältnismässige Ähnlichkeit zwischen dem Vorhutsanliegen der “Gesamtkunst” und Elemente “des Ideals” der Gesamtkunst, die die Vorhutskünstler am Ende der `30. Jahren als Gleichklänge mit jene humanistischen Werte berücksichtigten könnten, vorgebracht, bestimmt die freisinnigen Werten der sozialen Vorkriegsströmungen zu ersetzen. Der absichtliche Zweck war die Voraussetzung des Eigenschaftsdoppelsinnes der bekundeten künstlerischen Wahlen und des ästhetischen Ausgleiches zu versorgen. Überraschend die Gegenüberstellungsspannung zwischen dem Vorhutsideal der “Gesamtkunst” und die neuen Zwänge des Ideals der “Totalitärkunst”, bzw. zwischen dem Syntheseideal der Vorhutskunst und die Anliegen “Kunst für alle”, kennzeichnend der Ideologie des sozialistischen Realismus, haben wir in dieser Reihenfolge der Einfälle einige ästhetischen Dilemmata des Vorhutes der rumänischen bildenden Künste bemerkt.

The totalitarian ideology has reunited both the effects of an “inner disorder”¹ of a spiritual potential disease and of a “historical bewilderment”². In Totalitarianism, the legitimacy of the tension between the distinct symbolical

¹ Thérèse Delpech, 2005, p. 26.

² Alain Finkielkraut, 1998, p. 84.

universes, as a system of artistic values mutually, particular to societies divided into classes, had been reduced and radicalized to ideological confrontations particular to class fights, from the positions of absolute recognition of the proletarian legitimacy. Therefore, the systematic and violent rejection of intellectual dissidence, as well as of the artistic innovatory elites, among which the groups of the historical avant-garde from the beginning of the past century. In Alain Touraine's opinion, "Plus la mobilisation, c'est-à-dire, la modernisation elle-même, est forte, et plus l'État, au lieu d'être seulement despotique, devient *totalitaire*. Le XXe siècle fut avant tout [...] celui du totalitarisme. [...] Il ne laisse pas plus de place à la liberté personnelle qu'aux traditions culturelles [...]; il substitue le pouvoir absolu de l'État à l'action autonome des acteurs sociaux et de la culture, il dévore la société civile. [...] Ce n'est pas seulement la liberté personnelle qui est détruite; les appartenances culturelles le sont tout autant. [...] L'histoire se substitue à la société. La fusion du passé et de l'avenir écrase le présent et supprime l'espace public où se débattent les choix collectifs."³

The preeminence of the totalitarian dogma and the violent constraint of the right of the art that communism claimed to represent, have been the consequences of the violent setting up and the conservation through repressive means of this constitutional state, from the position of the new dominant class. Therefore, as Alain Touraine acknowledges, "un *totalitarisme culturel* succède à un *totalitarisme social*, comme celui-ci, le communisme, s'était opposé au *totalitarisme national* que représentait le nazisme.[...] Le totalitarisme est la plus grave maladie sociale de notre siècle.[...] C'est l'expérience du totalitarisme qui a mis fin à deux siècles de progressisme et d'historicisme et nous oblige aujourd'hui à défendre souvent l'homme contre le citoyen."⁴

From this outlook, the very definitions of art, as Finkelkraut observes⁵, from the sociological perspective broaden mainly by Bourdieu (1979), are reductible to just as many provocations of class fights, because, by means of certain artistic products arising from the ideological pressure performed by the totalitarian thought, these value judgments become as many canons through which the dominant class violently prescribes and imposes visions upon the world.

The difference between the avant-garde desideratum of "total" art and the prerogatives of the "ideal" communist totalitarian art, equally revolutionary, would reside in the fact that, while, for "a historical materialism advocate", the time stops in the very moment in which he writes history⁶, whereas, for the avant-garde artist, on the other hand, the present stands as the outpost, from where the course of the future can be determined or changed, as Antoine Compagnon acknowledges

³ Alain Touraine, 1998, p. 395-396.

⁴ *Ibidem*, p. 398, 399-400.

⁵ Alain Finkelkraut, 1998, p. 88: „la définition de l'art est «un enjeu de la lutte entre les classes» (Pierre Bourdieu, *La distinction. Critique sociale du jugement*, Editions de Minuit, 1979, p. 50)”.

⁶ Walter Benjamin, 2002, p. 201.

(1998)⁷. Therefore, it's no accident that the socialist realism practiced in Romania, and in the rest of the communist countries, held at its origins, the fight between the "Russian revolutionary artists and the soviet party propagandists". In this confrontation, having at its center the role of art and its means of expression, "the propagandists win over the initial authentic approach made by the avant-garde artists and they suppress it under the ideological prerogatives"⁸. Therefore, as Magda Cârnci acknowledges, in order to understand the Romanian version of the socialist realism, we must first understand its "classic" formula, representing the manifestation of a compromise that allowed the coexistence of several esthetic ideas and artistic forms: Marxist esthetic ideas, a 19th century realist stylistics (especially the Russian one, represented by "Peredvijniki" painters, such as Repin or Surikov), forms of romantic literature and forms of propagandistic and agitational art, as they had been practiced before and during the Russian revolution of 1917, to which it had been added the "subsequent distortions and simplifications, due to the dominating party birocra-tism". In conclusion, what had been initially implemented in Romania – and the other occupied countries – could be considered an "idealized, declamatory classicism", characterized by esthetic dogmatism and ideological inflation. It had become compulsory, therefore, to impose a retrograde and anachronic esthetic paradigm, the soviet artists turning into mandatory role model standards and the only ones completely valid.⁹

In order for this artistic program to succeed, it also required the proper instruments of art ideological manipulation. A first major form of manipulation was the propaganda and the constraint of soviet models. A second form of manipulation, equally efficient, consisted in the interdiction of performing certain predominant artistic genres during the interwar period. As a consequence, a third radical form of manipulation consisted in creating a new artistic genres hierarchy, according to their relevance to the social changes which were already happening or were about to happen.

Given the circumstances, the role of socialist realism, was that of hiding the tangible reality, of disguising it through making appeal to the ideological non-reality, which existed according to the Party's will and at the same time representing it. Following Alain Besançon (1996), in this sense, Magda Cârnci observed that as long as the esthetics of this kind of realism worked by using political means, it was inevitable that it would get to even suggest "butaforic allegories, whose core is actually a <<void image>>, covering the nothingness of <<future>> reality, which, magically, must already be made <<present>>."¹⁰ Behind all these realities, there lied the ideologists of the time. It is well know in the specialty literature, the extremely harsh Stalinism of the Romanian ruling class,

⁷ Antoine Compagnon, 1998, p. 45, 46.

⁸ Magda Cârnci, 2000, p.23, 24.

⁹ Magda Cârnci, *op.cit.*, p.23-26.

¹⁰ *Ibidem*, p. 26-31, 39-42.

which has made in our country to be practiced one of the most severe forms of artistic control among all eastern European countries. It is no accident that the Romanian of Russian origin, Nicolai Moraru was among the most rigid ideologists in Eastern Europe, being compared to Wazyk, Révai or Putrament.

In this new context, the artists have developed different survival strategies. Being the manipulators of some symbolic capital of society, in their position of intellectuals, the artists became entitled of managing the legitimacy of community values. The artists were now responsible with socializing the political project. In this case, they were imposed the role of simple practitioners and re-presenters of some ideological precepts and not being part of their elaboration. In this sense, it has been accredited the idea that the Romanian intellectuals, similar to the Czechoslovaks, had been expressed much passive attitudes than the reactions expressed by the Polish or Hungarians towards the rigors of totalitarian dogma. According to the opinions expressed by most of the modern analysts, the long historical experience, the orthodox religious education and the collective memory would stand at the origins of conformism, of passivity and dissimulation specific to Romanian intellectuals.¹¹ Obviously, exceptions have been recorded among some of the internationally notorious artists, who faced with corruption, constraint and terror have chose living in exile. Among these, Victor Brauner or Marcel Iancu, have continued abroad their activity of protagonists and animators of the avant-garde.¹²

If it will become accepted that the fine art of the 20th century has recorded in its beginnings a series of “realisms” and, implicitly, multiple references to tradition of this kind, then the reasons of accepting the socialist realism, can overcome, though, by complexity, the circumstantial socio-historical explanations. Resorting to this kind of explanation, the specialty literature has often had the tendency of isolating the socialist realism from the wider artistic context and of transforming it in some “unexplainable esthetic monstrosity”.¹³ Therefore, the socialist realism esthetics is far from being brand new in the age. During the 30s’, there was what has become the tradition of the so-called “social realism”. It has influenced the Nazi and the fascist art, the art promoted in France by the Popular Front or the regionalist current from the United States of America.

Therefore, the experience of socialist realism was made possible also by the fact that the local realist tradition was still alive and even predominant in Eastern Europe during that time: “In Romania, for instance, as Magda Cârnelci observes, during the inter-war period, had existed a predominantly realist art production, of neoclassical and neoorthodox tendency, influenced only by the borrowings of first impressionist and postimpressionist modernity, which had been promoted by certain traditionalist cultural groups, that were against rapid economic modernization and radical modernism in art. This artistic production, especially

¹¹ *Ibidem*, p. 23-31, 39.

¹² Geo Șerban, 1996, p. 23, 24.

¹³ Magda Cârnelci, *op. cit.*, p. 39.

postimpressionist in painting and neoclassicist in sculpture, was sustained by the Royal House and the state philanthropists of the time, as well as the predominant taste of the middle class in full expansion."¹⁴ Many of the Romanian artists had been therefore influenced by the trend of "new realism" of the 20s-30s. After the setting up of the royal dictatorship and afterwards of the semi-fascist regime, this trend had become more of a presence in Romania. It is possible that, under these circumstances, the socialist realism to have stirred certain favorable vibes, to these conformist artists, on one hand, and to the avant-garde artists converted to communism because of the previously stated political-esthetic circumstance, on the other hand. Paradoxically, the encounter between the social and socialist realism could even produce at times certain valuable esthetic results, as in the case of Alexandru Ciucurencu or Corneliu Baba.

This "social realism" must be related to another ideological phenomenon from the beginning of the century: in the countries where the effects of modernity had also brought the stunning economical crisis from the first decades, it had been created, as a counterpart, the so-called "mass democracy", whose corollary was the "mass culture". Similarly, the "new classicism" trend of the 20s', which had preceded the social realism from the 30s', had been marked by economical crisis brought by the World War I.

This crisis had been politically followed by a more and more emphasized nationalist trend, accentuated by the sense that first modernity project would have carried the blame of being "too" avant-gardist. Therefore, before even the World War II, numerous artists, mostly modernists and even avant-gardists (be they Western or Eastern) have discovered the "errors of modern art", the need of "engaging in the real" and the necessity of "returning to order", an artistic order, more or less traditionalist. In this way, "the total political project" of socialist realism seemed up to impulse the avant-gardist artistic project, which, in its turn, had the totalitarian urge. That certain "*engaged art*" promoted by a part of the interwar artistic avant-garde, now had the chance to slip towards a fully "*controlled art*". But this thing happened in Romania, with the price of losing the avant-gardist nature of the works of art. On the other hand, the international context of the 50s' had also been a period marked by the tensions of the Cold War, which had separated the political "gulags", as well as the artistic "fields", particular for the Western and the soviet worlds. Therefore, concludes Magda Cârnelci, there had been also external reasons for which the socialist realism was supposed to represent the eastern European socialist values, as opposed to the "bourgeois avant-gardism" of the capitalist block. Similarly, the abstract expressionism promoted as "state avant-garde", by the United States throughout the free world at the end of the 50s can be in its turn perceived as an "imperialist artistic ideology", spread over the Western art of that time.¹⁵

¹⁴ *Ibidem*, p. 41-42

¹⁵ *Ibidem*, p. 42.

As a result, there have been artists, who in Magda Cârnci's opinion, "have seen in the communist ideology a continuation of the pre-war currents of humanist and socialist thinking."¹⁶ It is about a group of avant-garde artists, whom have either been sympathizers, either even illegal members of the Communist Party, starting with the late 30s'. The painters Max Herman and Hans Mattis-Teutsch, drawers Jules Perahim, Aurel Jiquidi, Hans Hermann, Vasile Kazar or the sculptor Geza Vida are the best known representatives of this direction.

Surely, we can ask ourselves, why the communist utopia had convinced these cultural personalities. This political doctrine seemed to come up with new humanist values that would replace the liberal values of the pre-war Western social currents, discredited by the catastrophe of war.

Finally, some of these "engaged" artists have realized, though, that their cultural idealism was not in place with the one of the ruling class ideology, only capable of humble imitation of the soviet precepts. Even though, the art of the most numerous engaged artists, who could not escape this culturally subdued or marginalized position or who have forgotten too soon that they were only playing a role, had been completely distorted and compromised by such a sterile and unfortunate exercise, in the name of the ideological utopia of the boundless and continuous progress. The insidious reasons for which the straight ideological effects upon art could have stayed unnoticed, in the case of totalitarian regimes, seem to have the same subversive nature as those identified by Walter Benjamin, as being effects of the bourgeois society upon the individual life. It is mainly about the ambiguous and even irrational dimension, which the communist ideology was managing to constantly transfer upon the everyday reality.

From this point of view, it is relevant the comparison between Max Herman Maxy and another avant-garde artist, Jules Perahim, whose career, due to the ideological concessions made, it has recorded a professional evolution, but who, as we are going to see later on, understood to break the vicious cycle in which he found himself, so that, once arrived in France, to return, authentically, to his previous artistic beliefs. Jules Perahim had initially been a surrealist artist, who, as an "engaged artist", just like Maxy, had managed to influence from within the faith of his artistic guild. "Metamorphosing" himself, as result of the process of reeducation, Jules Perahim had become the most renowned illustrator of the realist-socialist novels at that time. The 60s' were for both artists a comeback to the artistic precepts before their ideological "reconversion". However, unlike Perahim's creation, Maxy's art could not be convincing anymore: "His rational painting, as Magda Cârnci observes, relying mainly on the logical structure of the image and less on color, would know a dramatic attempt during the 60s' to return to an cubist-constructivist syncretism, which lacked in any notable results".¹⁷ Things were

¹⁶ *Ibidem*, p. 35.

¹⁷ *Ibidem*, p. 36.

different in the case of Jules Perahim though. By the end of the 60s' due to the highly accentuated anti-Semitic tendency of the regime, Perahim has left the country, in order to reinvent himself as a surrealist painter, in France. Moreover, many men of letters or of the arts, ex avant-garde artists, converted to the doctrine of the Single-Party, have ultimately chosen the exile, despite all the privileges which they temporarily held.

A fervent upholder of some highly impressive avant-garde magazines, ("*Integral*", "*Contimporanul*", "*Unu*"), scenographer, decorator and member of the *Decorative Arts Academy*, run by him since 1928, Max Herman Maxy, has been defined, with good reason, like this: "He affirms himself as the most dynamic and active avant-garde representative, on creative and organizational levels, being present at exhibitions of *Contimporanul*, *Grupul de artă nouă*, or *Grupul plastic*."¹⁸

Gradually, however, mainly after 1926, Maxy's creation starts being affected by an increasingly prominent social character. Therefore, his painting will prefigure itself in the very dramatic changes that art has suffered after the year of 1944, by the striking contrast between his previous works and the dogmatic compositions that the communist regime imposed on him afterwards. It can be argued that, in this case, it has been produced one of those changes, that Walter Benjamin sets between the moments in which the artistic production eliminates the authenticity criterion, its social function ceasing to found itself on ritual, but rather on politics, instead.¹⁹

We aim therefore at pursuing the how and the why things have, in Maxy's case and of other artists, developed into some art conceptions completely affected by ideology. Starting from the premises that, despite of these artists' previous socialist beliefs, they have been the subjects of the same "artistic reeducation", after the year of 1944. This process is extremely obvious, not only as compared with the artist's works from the inter-war period, creations that correspond to a completely different esthetics, but also by relating to a series of paintings from the highly ideologically influenced period between 1952-1958. Among these, we mention *Sonda noua la Moreni* (1952) and *Interior de uzina la Resita* (1958).

As previously stated, we start with the premises that between 1952-1958, when these two paintings were created, it had been the period of the last "stylistic" decantations, which held at their basis a process of "reeducation" of this avant-garde artist. In order to better emphasize the constrains to which Maxy had been subjected to, we will make another attempt to examine this process, but from the perspective of totalitarian ideology. To support this case study we are making use of some documents, highly representative by their strong servitude to the communist constrains such are the studies published by Radu Bogdan and Eugen Schileru in the volume coordinated by Mircea Popescu in 1959, texts that talk

¹⁸ Alexandru Cebuc, Vasile Florea, Negoită Lăptoiu, 2000, 2003, București, p. 115.

¹⁹ Walter Benjamin, 2002 (a), p. 3.

about the systematic actions between 1944-1948, through which the totalitarian communist power had developed the process of “correcting the mistakes” made by some interwar artists, and also about the repercussions of these violent actions of “reeducation” performed in the 50s. According to these texts, the first notable changes produced by this “reeducation” repressive program, had made themselves felt at the *Official Painting and Sculpture Salon* in 1945.

According to the same source, it is acknowledged the fact that, until close to 1948, there is an evolution towards the direction of a “rehumanization of art”, the man rebecoming the center of the thematic concern. Through the “Party” and the “Progressist” press, it is militating in favor of a “more direct approach to reality of the engaged artists, a plastic language that is more accessible to the masses”. Finally, it is also claimed that between 1945-1948 it has been developed a stage of research that aimed to eliminate the “subjectivism”, particular to the interwar period.

The ideological manipulation in the graphics field had been another important instrument of the implementation of the socialist realism formula. By using the syntagm “easel graphics”, a programmatic text signed by Ion Frunzetti and Remus Niculescu, within the same anthology coordinated by Mircea Popescu (1959)²⁰, imposed an ideological series of artistic prerogatives, and prescribing as conclusions, the following observations having the value of the categorical imperative. In essence, this document once again represents the expression of the same ideological reconversion process that has been felt by the entire field of fine arts, with reference to the same period of artistic reeducation between 1944-1948. After the year of 1944, as the text highlights, the easel graphics concerns had reoriented towards the contemporary life and had reconnected with the “realist tradition”.

Similar to the case of Ligia Macovei’s graphics, within the ideological messages of mass reeducation, the manifested artistic identity did not belong so much to the “characters”, “the human figures” they represented, but rather to the ideologies’ intentions of implementing within the masses, through the fiction manipulation artistically represented by these characters. The manipulation of the artistic representations was thus attested each time, by an ideological message “clearly perceptible” to the educated masses and it constantly tested an explicit dogmatic capital, which attempted that, through “psychological deepening” of the “inner lives”, the identity of the artistic figuration to descend, from representation, into the people’s lives and to mold them according to the ideological dogma. Therefore, the “new humanism” and “rehumanization” of the art were accomplished by manipulating the psychological side of the “characters”, dimension seen as a receptacle of the new social changes, because the socialist realism, beyond the manipulation of the actual identity of these “characters”, was rather interested in identifying them with the new social functions they had to practice.

²⁰ Mircea Popescu, *et al.*, 1959, p.130.

Behind the images though, behind the representations performed by the “engaged” artists, there are gradually created a series of figures of some rhetoric of the ideological discourse, whose terms we have attempted to rebuild, starting from the words, syntagms, periphrases or the enunciations previously cited from the ideologized texts of the time. Among the most important phraseological units of this kind, there are mainly the following: the “new humanism”, “reality”, the necessity of “bearing the historical stamps”, (in the sense of historical fact, of historicity), “historical moment”, the “psychological dimension of the new man”, the necessity of “rebuilding” the country, “monographic representation”, the necessity of a “rehumanization of art”, a “plastic language that is more accessible to the masses”, eliminating the “subjectivism”, the concerns about “formal” and the “evansionist” tendencies, the necessity of sticking to the “significant”, the eloquent resuming a “personality”, the necessity of eliminating the plastic “motif”, and in the case of artistic representations with and about workers, the highlight of “eliminating the exploitation, from their positions”.

In the case of some works by M. H. Maxy, for instance, “the rehumanization of the art” and the “new humanism” are being achieved not only indirectly, through discourse manipulation from behind the images, but also directly, through the values of clarifying of their titles, thing which discursively contributes to a faster and more eloquent decoding of the imagistic support. The fiction or utopia of an agro-industrial country, for instance, was clarified and maintained through a series of titles eloquent for the desire of “brotherhood” between workers and peasants, and also for the idea of a “sovereign proletariat”: *Sonda noua la Moreni, Muncitori din Petrila* or *Interior de uzina la Resita, Muncitorii repara uneltele taranilor* or *Ion Fintesteamu in rolul lui Orgon*. In the case of this last work – the only painting from the ones abovementioned, which reveals us the character’s identity – it can be argued that the artistic representation lies on a higher level of the “humanization of the art”, since the title itself talks about the eloquent “resuming” of a “personality”, through the framing of playing a role.

All these “stories” or fictions of the ideological discourse from behind the images reveal us, according to Pavel Şuşară, the way in which Max Herman Maxy, for instance, has given up on his previous esthetic beliefs, gradually replacing them with “socialist realist story”.²¹ Following the footsteps of Mircea Deac²², which has launched the essential ambiguity artistic thesis of the most notable Romanian avant-garde artists’ creation, among which Max Herman Maxy, Hans Mattis – Teutsch, Saşa Pană or Jules Perahim, we have intended to research to what extent the avant-garde artists have subscribed out of their own conviction to the socialist realism dogma and to what extent these were actually constrained to such an ideological “conversion”, through the program of “artistic reeducation” from the half of the last century. In this

²¹ Pavel Şuşară, 2004, p. 7.

²² Mircea Deac, 2003, p. 44.

sense, we have largely defined socialist realism “program”, the means of ideological manipulation of the art, the causes of tensions among the communist leaders, on one hand, and the historical avant-garde artists and intellectuals, on the other hand, so that, ultimately, to accomplish an overview of the socialist realism ideology, from the perspective of the “rehumanization of the art” idea and of its revelatory sense of the social changes.

At this level, it has been invoked the relative similarity between the avant-garde desideratum of the “total” art and elements belonging to the “ideal” of the totalitarian art, which the avant-garde artists could have considered by the end of the 30s’ as being according to those humanist values meant to replace the liberal values of the prewar social currents. Therefore, the artistic avant-garde and the communist ideology, mutually shared the belief that, just like in the case of the revolutionary classes, the radical artistic groups were also responsible for interrupting the history continuum and to change its course in the terms of “founder violence”: “The entire violence is, according to Walter Benjamin, as a means, either founder of the law, either preserver of the law. If it does not claim to both attributes, it itself renounces to any availability.”²³

As a conclusion, even if the political implications of Romanian fine arts avant-garde were at their origins rather accidental than the result of some authentic beliefs, it is not less true that the esthetic positions of the renowned artists’ majority from the interwar period – including the avant-garde artists like Max Herman Maxy, Jules Perahim or Hans Mattis-Teutsch, who found the communist ideology, as being a beneficial ramification of the humanist and socialist insight upon the prewar period currents of thought – have maintained the essential ambiguity hypothesis of the expressed artistic options and of the esthetic compromise. These have either been seduced by universal potential of communism, either have they manifested an unexpected obedience towards the new political system. In these circumstances, the thesis suggested by Boris Groys²⁴, is meant to eliminate the Manichaeism vision that opposes the State-Party, which creates the “new man”, to the avant-garde currents of the 20s’, subordinated to some “democratic” art. Therefore, Boris Groys identifies a contradiction between artistic avant-garde ideology of the third decade and the socialist realism ideology, only on esthetic level, arguing that their cultural, social and political projects would be relatively coincidental.

In this sense, we have revealed some of the esthetic dilemmas of the Romanian fine arts avant-garde, grasping the confrontational tension between the avant-garde ideal of “total art” and the new constraints of the “totalitarian art” ideal, respectively between the synthesis ideal of the avant-garde art and the desideratums of the “art for all”, particular to the socialist realism ideology.

²³ Walter Benjamin, 2004, p. 14.

²⁴ Boris Groys, *apud* Claude Karnoouh, 2000, p. 82, 83.

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THE BALANCE OF ABILITIES AND KNOWLEDGE IN MOTHER TONGUE EDUCATION

FÓRIS-FERENCZI RITA

ZUSAMMENFASSUNG. Die Studie behandelt - auf den ungarischen Muttersprachenunterricht bezogen - die Rolle der Gleichgewichtung von kompetenzbildenden, informationsvermittelnden und Lernfähigkeiten im Lernprozess.

Frühere pädagogische Theoriensysteme behandelten diese voneinander untrennbaren Elemente des Lernens nicht als gleichwertige Faktoren. Die informationszentrierte Pädagogik setzt den Schwerpunkt auf Informationsvermittlung, die handlungszentrierte Pädagogik auf die Durchführung von Handlungen. Diese Betrachtungsweisen widerspiegeln sich auch in der Entwicklung der Lehrpläne: Den dominanten pädagogischen Paradigmen entsprechend entstanden informations- bzw. handlungszentrierte Lerplantypen. Infolge der Lehrplanreformen der siebziger Jahre entstehen jene sich an Fertigkeitentwicklung orientierenden Lehrpläne, deren Aufgabenstellung das Prinzip vertritt, dass für die Fertigkeitentwicklung sowohl die Handlung selbst, als auch das dem auf der Handlung beruhenden Lernprozess vorangehende Einbetten von Information in das Wissen wesentlich sind.

Unabhängig vom Paradigmenwandel in der Pädagogik bzw. in der Lehrplanentwicklung wirken im Alltag des Muttersprachenunterrichts unterschwellig die früheren Prinzipien weiter.

Die Studie stellt einen Versuch dar, durch Differenzierung der Schwerpunkte im Muttersprachenunterricht für die Wesentlichkeit der Gleichgewichtung der fertigkeitbildenden, informationsvermittelnden und Lernaktivitäten Argumente anzuführen.

SCHLÜSSELWÖRTER: Kommunikationsfähigkeit, Kenntnisse, Lernfähigkeiten, informationszentrierter Unterricht, erziehender Unterricht, handlungszentrierter Unterricht, Fertigkeitentwicklung, Instrumentalwissen mit Fertigkeitscharakter, Inhaltskenntnis, Lerplantypen, Typen von Unterrichtsstunden, direkter Unterricht, Infusionsmodell, Methoden.

The balance of abilities and knowledge in mother tongue education

The planning, regulation of the learning process, the daily educational work is determined by how the pedagogue defies the link between knowledge, learning activities and abilities. As a result of the historical development in pedagogical theory we do not differentiate these areas, we admit that abilities manifest themselves in activity situations and every successful performance of an activity needs functional knowledge. Although we consider the balance between these three defining elements of knowledge as something natural, the previous perceptions – which defined the curriculum approaches, and the focal points of classes as well as educational strategies

and methods – differentiated the cognition and ability-type knowledge. This approach still functions covertly in the educational process.

The clarification of the links between these layers of knowledge is particularly important in mother tongue education as this subject is a transition between the dominantly knowledge-transmitting and ability-developing subjects and in this respect it presumes the development of knowledge embedded in activities.¹

The study presents the issue of the basic factors of cognition, the balance between abilities, knowledge and learning activities, it trails how these factors become the focus of the learning process in mother tongue education from the point of view of pedagogical theoretical systems, curricula, as well as that of the content focal point and applied methods.

1. Knowledge and abilities

In the current perception of learning, teaching cannot be identified with the unilateral transmission of knowledge, with its practice, having in mind a distant goal of ability development. Taking into consideration mother tongue education the approach according to which the teaching of grammar, language correctness, orthography, their systematic acquisition and practice leads to development in language abilities, conscious language use, correct speech and writing, as well as efficient communication, is outworn.

For centuries, as a result of the dominating concept in education, within the learning process the acquisition of theoretical knowledge (such as grammatical notions, rules) was a priority and the practical applications followed it. In this approach knowledge become the centre of the learning process.²

The activating pedagogy of the beginning of the 20th century – although it was not really present in the Romanian school system – imagined this process exactly the other way around. According to its system of concepts the performing of appropriate activities, their practice depending on the spontaneous development of the learners is a much effective way to develop abilities. Learning by experience in this respect emphasized activities and activation.³

¹ Based on the focal point of subjects we differentiate the following three groups: dominantly cognition transmission based subjects (such as biology, geography and other sciences), dominantly skill developing subjects (such as physical education and arts) and subjects built on the balance between knowledge and abilities (such as mother tongue, foreign languages) (Káldi–Kádárné 1996. 75.).

² The knowledge-centered pedagogical approach is presented in the prescriptive, rationing curricula. Its application in education resulted in the curriculum centered school, which stressed the “transmission” and acquisition of knowledge. See *The content focal point of curricula* chapter.

³ The above presented concept had as its result in curriculum development the activity centered, didactic curriculum. This type of curriculum did not spread in Romania, as during the years of communism the strictly centered educational policies froze the previous pedagogical approaches. Its main reason resulted from the educational policies, as only those pedagogical concepts could be applied, which served the dominating power constellation. The control of the strictly centered education, the selection of contents according to the communist ideology, the supervising of the teacher’s work was effectively ensured by the

The models building directly on the teaching of abilities⁴ marginalized knowledge, leaning on the belief that abilities can be taught directly, and their development does not really depend on the content of education.

The above described approaches confronted knowledge, activities and abilities, focusing on and overemphasizing the importance on one of them. These previous interpretations were changed by the ones that stressed the balance, equality and interdependence of knowledge, activities and abilities. The subordinating relations turned into balance and mutual relations: abilities and knowledge act together in an inseparable way, and are equally important in the solving of every activity or problem situation.

In the previous approaches – from the point of view of education – we differentiated *knowledge* and *ability-type* cognition (content and tool knowledge). In the early cognitive psychology they mention two types of knowledge (in connection with the reorganization and storing of knowledge): declarative (knowledge type) and procedural (ability type) cognition, but they stress the fact that these, both from the point of view of learning and that of memory can be viewed in their interaction. (Csapó 2004. 90–91., Bernáth 2004. 224–229.).

From the point of view of the educational practice we need to differentiate the two only to see more clearly what factors function within this interaction: the content knowledge “is the system of information in our consciousness, tool knowledge on the other hand is the one with the help of which we can acquire new content knowledge and which helps us use the elements of content knowledge in our daily lives” (Nahalka 1998. 202).

The rehabilitation of knowledge is closely connected with the recognition according to which abilities are not general, in this respect we cannot assume a tool knowledge which can be applied in all problem situations; our tool knowledge is content knowledge as well, consequently the development of certain abilities is linked to a given content.⁵

knowledge-centered curriculum.

⁴ The movement of critical thinking emphasized for example the direct teaching of thinking abilities, marginalizing knowledge. According to this approach the ones who become able to acquire a flexible, open thinking, confronting different points of view, can activate this ability regardless of the situation and content.

⁵ This is closely linked to intelligence-research. Gardner’s (1989) studies made it clear that intelligence is not uniform, we can speak about general mental abilities and understanding, but this is a multiple and layered intelligence, with several separate components. Gardner differentiated six components: linguistic, logical-mathematical, spatial, musical, movement, personal. (Gyóri Miklós 2004. 262.) According to Carroll’s (1993) research intelligence has a hierarchical structure: the highest stratum is general intelligence, the second stratum contains liquid intelligence, crystallized intelligence, the general factor of learning and memory, visual perception, auditory perception, retrieval ability, cognitive speediness and processing speed, and the first stratum the general sequential thinking, inductive thinking, quantitative thinking and the Piaget-type (operational) thinking. Liquid intelligence does not so much depend on culture, learning. Language development, verbal understanding, lexical knowledge, the decoding during reading, the orthography ability, the grammatical sensitivity etc. belong to the crystallized knowledge, depending on experience, learning, culture (Csapó 2004. 21.), in this respect it is a kind of tool knowledge the development of which depends on the embedded knowledge.

Taking into consideration the communicative abilities, the interdependence of tool and content knowledge is well presented in the learning of writing and reading. Both of them seem to be tool knowledge, because we apply them as automatic skills: while we write and read we do not need to stop and think how we should write or pronounce the different letters. Nevertheless this knowledge of ours is a general content knowledge (Nahalka 1998. 202) in the sense that we not only practice it (just as walking or cycling), but at their forming stage we needed to embed specific contents (knowledge) (such as the learning of the letters, their form, etc.)

In this balance between abilities, knowledge and activities the main role of education is the facilitation of the joint development of abilities and knowledge needed for “know how”. This does not mean that children do not have to learn anything, and that we can cast out knowledge from schools. Abilities are content specific (in this respect the development of an ability depends of the contents and knowledge linked to action performance). At the same time it is situation and context specific as well, this meaning that the knowledge acquired through activities performed on a content does not automatically apply to other actions or problem situations. Applicability is determined by the situation, context in which we learn something. From the point of view of mother-tongue education this information means that if the learner has developed the ability of sentence or word analysis, or as a vocabulary building activity s/he can enumerate the synonyms and antonyms of a given word, s/he is practiced in sentence and word analysis, word collection, but this knowledge does not apply to other situations, does not function automatically when s/he needs to form sentences in speech or in writing.

Therefore one should not imagine knowledge transmission as an automatic process. If the vocabulary building exercises can be performed only taken out of the writing, speaking situation, the student will simply not remember that the final purpose of this is to teach him/her how to express himself/herself, and that the most adequate words should be used depending on the addressee, type of text, and speaking situation.

In the education focusing on ability development we have to take into consideration that the child has already got language skills when entering the educational system. S/he is an expert in language (language production), knows the rules and forms of societal behaviour to an extent at which s/he can get on with the daily speaking situations s/he is used to. Development could be helped with the activation of the pre-existing knowledge (“what is that I know in fact?”) and with the expansion, reorganization of these, through building on new experiences, the language ability/knowledge would grow through its trial in the more complicated, varied problem and communicational situations.

2. The content focal point of the curricula

The change in the content focal point of the curricula⁶ is closely connected to the historical changes in our concepts about learning and knowledge. The

⁶ The content focal point is not exclusive; it signals the main organizing concept of the curriculum, its most elaborated part. For example a knowledge centered curriculum contains ability developing specifications as well, but its most detailed part is the system of knowledge that must be taught.

content-centred curricula⁷ are specific to the knowledge-centred educational systems, and its theoretical basis consists of the instructional approach. Its goal is the outlining of an ideal person as the result of education and its achievement through the teaching of the adequately selected contents (Nagy 1994. 368).

The critical phenomena of the functioning and effects of the syllabus-centred educational systems are explained by Nagy in the following way. The syllabus-based curriculum presents what themes and knowledge of what subject must be taught. Although it refers to the fact that during the teaching of these themes one needs to develop skills, abilities, thinking, the educational system built on the syllabus-centred curricula is arranged to transmit contents: “must be taught”, “must be transmitted”, “the syllabus must be followed through”. The previous school language usage is not only an empty cliché, as the teaching experience shows that there is no time and opportunity for deepening, digressions and taking into consideration personal learning rhythms in the process of going through the syllabus in time. Nagy illustrates the negative effects of instructive education with the growth of functional analphabetism⁸ and as an explanation he refers to the fact that in the content-centred schools the basic skills and abilities (such as text understanding) could not be developed because this must be achieved in the first years of the educational process, and, regardless of the level each individual achieved, the conscious development of this ability stops. There is no time for this, because the schools are accounted for having taught the contents in the curriculum.⁹

As an attempt to overcome the unilateral nature of the acquisition of contents and texts the pragmatic pedagogy emphasized the inseparability of experience and the cognitive subject. As a conscious school application of spontaneous socialization and experimental learning, the activating education has stressed activities, and as a result

⁷ The syllabi of the present Romanian core curriculum are requirement based types of curriculum. The functioning of this new curriculum concept is prevented by the fact that before 1989 we had prescriptive, rationing type, knowledge-centered curricula, which have formed a certain system of customs of curriculum interpretation and usage, as well as a certain type of teaching practice, which is active regardless of the changes in curriculum approaches.

⁸ This phenomenon is verified by the PISA-researches, their results on text understanding show that the students have very poor text understanding abilities. They become impaired in the performance of school work (informational texts, the understanding of information, etc.).

⁹ The interpretation of this could be that regardless of the level the child reaches from the point of view of basic learning abilities (reading technique, text comprehension, arithmetic, etc.) we expect him or her to develop the subject knowledge (for example natural sciences, historical knowledge, reading literature etc.). In case the child cannot read on the level of decoding, or does not possess text comprehension strategies (capturing the object and theme of the text based on key words, pointing out the main information from the headings, summarizing the text, etc.) s/he will not be able to find the information connected to the different subjects (natural sciences, history etc.) in the textbook or in other informational sources. The poor results in history are not due to the lack of learning; learning is a problem because the student does not have the specific (learning) strategies which facilitate the emphasis, systematization, fixation of the different information. This means that until the student does not develop these basic abilities of communication and learning to the required level, we cannot expect him or her to get along in the subject knowledge.

they expected the formation of different behaviours, attitudes, abilities. This basic approach characterizes the pedagogical reforms carried out by alternative schools.

This approach – on the level of the curriculum – comes into being in the form of the activity centred curricula. In Nagy's opinion the hypothesis of experience centred educational systems is basically the same as that of instructional education, as they build on the logic of the intangible "hoped for development", not with the acquisition of the syllabus but with the performing of given activities, actions (1994. 370–371.).

The deficiencies originating from the unilateral nature of instructional and activation education support the fact that the knowledge and activity centred curricula and educational systems cannot be mutually exclusive alternatives. The consciousness developing instructional education and the willingly socializing activation education is united in the human-centred, character developing educational system. This approach– on the level of the curriculum – comes into action in the ability developing type of curriculum, which levels the requirements by taking into consideration the basic conditions for the work and elements of the character, together with concretizing the development which is expected as the result of learning in the form of specific achievements, and to this complex system of requirements it assigns the specific contents, knowledge and activities.

The content focal point of this type of curriculum is a system of requirements which mixes the syllabus (knowledge) and learning activities, as well as the two factors (the expected result of learning).

The syllabus, activity and performance centeredness of curricula does not prevail in an exclusive way; it signals the main organizational, systematic concept of the curriculum.

As a conclusion we can state that from the point of view of content focal point we can differentiate three types of curricula. The main organizational concept of *syllabus-centred or thematic* curriculum is the systematization of contents and knowledge. This type of curriculum specifies the knowledge the transmission of which is the role of the educational system. It wishes to answer the question: *What should we teach?*

Its theoretical background is based on the concept that the content of teaching, the syllabi and the requirement of systems of knowledge ensure equal opportunities. This curriculum contains the regular teaching goals, general requirements, but its best developed part is the syllabus (broken down to topics, themes, sub-themes, notions).

The *action-centred or didactic* curriculum stresses the teachers' and the students' activities, it systematizes the activities with the help of which the teacher has to facilitate the students to perform. Its important unit is the system of activities, this being completed with the required social and practical habits, skills and abilities, and to these knowledge is submitted. The central question of this curriculum is *how?* What do the students need to do, what situations for activities

does the teacher need to create in order the students to enter into possession of knowledge and abilities as a result of performing the specific activities?

The *requirement-centred (taxonomic)* curriculum emphasizes the performance of the students, systematizes the levels of performance the students need to achieve at each step (Szebenyi–Horánszky 1993. 7.). *What does the student need to know* – this is the question these curricula answer. They facilitate the levelling of the requirements to years or educational periods. In contrast with the unilateral nature of knowledge transmission the requirement-centred curriculum it mixes the advantages of knowledge and activity-centred curricula, balancing experimental and conceptual learning and subordinates this top character building. In this respect it could be called *ability-developing curriculum* as well. From the point of view of curriculum-building the most important and detailed part is the system of requirements which levels the knowledge and activities needed for the development of a certain behaviour, attitude or skill. The central part of the curriculum is the system of requirements expected from the student¹⁰ which – due to the nature of ability development – mixes knowledge and learning activities.

3. The content focal point of classes

Ability, activity and content has been present as the result of previous pedagogical theoretical systems and the application of the curricula originating from these systems mainly is the content focal point of classes regardless of the nature of the subjects themselves. In mother tongue education we can clearly differentiate the types of classes in which knowledge and the activities focusing on the direct teaching of abilities are stressed, and they are built on the balance between abilities, activities and knowledge.

In the problematization of the knowledge-centred approach we are going to choose a theme of which it is hard to believe that it could be taught in a knowledge-centred way: *dialogue*. If we plan a knowledge-centred class the aims of the lesson will be the following: *the presentation of dialogue, the differentiation of the types of dialogue (role-preserving, role-switching), the presentation of the parts of the dialogue, the understanding of the role of dialogue in literature*.¹¹

During this class there is going to be no dialogues uttered, its written form is going to be an illustration, based on which the structure and basic types of dialogue can be fixed. The topic of this class has moved far away from the dialogue the child knows from previous experience and, applied to literary texts, it will function as a device to form and describe characters.¹² Homework aims at the

¹⁰ The British, New Zealand, Hungarian and Romanian core curriculum belongs to this type.

¹¹ The examples for knowledge-centred classes come from lesson plans of university students.

¹² It is a well known practice in mother tongue education to illustrate forms of communication, types of texts and the organizing concept of texts with literary examples. In the case of *dialogue* the hindrances of this approach are obvious (we could give similar examples for narrative and descriptive types of communication as well). The children could better understand the function and role of dialogues in literary texts if s/he could

practice of the theoretical knowledge: *You are talking with your mother. Write down the dialogue in two variants, the first being the role-switching, the second the role-preserving one!*¹³

It is possible that the child who was missing from class – if s/he figures out what “role-switching” and “role-preserving” means – can much more easily perform the task that the one who was present and needs to bring back the “dialogue” distanced to the level of knowledge into the context of the home. The results of these are usually some dialogues that would never be uttered in reality.

Knowledge-centred approach urges us to realize that the teaching of abstract notions about dialogue and its fixation on the theoretical level does not result in the development of communicational abilities, the identification of the different types of dialogue in daily communicational situations as well as the possibility of identifying communicational disorders and their correction. Theoretical knowledge thusly cannot be applied directly in practice.

In contrast with the knowledge-centred approach the activity-centred classes which aim at the direct teaching of abilities is to the liking of most of students, but when we ask them what they did in class, most of them would say: “I don’t know, I don’t remember, but the class was very good.” In the focal point of this class we have activities, knowledge remains concealed, the main aim being the direct transmission of abilities.

In the pedagogical practice we apply the activity-centred approach of the dialogue on the problem of non-verbal communication. Its frequently used tool and method is the communicational game, role-play, pantomime, conflict-managing exercises, debate and negotiation games.

We need to mention that we do not question the applicability and usefulness of these methods and situations; we would like to stress that activities without reflections to the performance of these do not result in conscious learning. Although classes built upon communicational games are interesting and fun, if the playing situations are not followed by discussion, reflections to experience, the aim and purpose of the given situation will probably not be shown.

From the point of view of metacognition these game situations need to be completed with questions that aid the observation or understanding of the game, knowledge (for example referring to the structure of dialogue, or the elements of

recognize it based on the dialogues close to daily communication, could realize all the information s/he has on it, would have a basis for contrast in order to notice – applied to the previous knowledge – that the forms of communication can change in the literary communication and can get different meanings. This difference, the special function emanating from this can be understood only if one contrasts these with the expectations we have based on something usual, known.

¹³ It happens very often that – without us noticing – we pass the real problem and its understanding to the student as homework, we ask something as a personal task which we did not teach as such or in the context in which it can appear in daily language use and we only illustrated the applicable knowledge, which does not mean that the student had understood the essence of the lesson and can apply it at the same time.

non-verbal communication) will merge into these questions as the tools and points of view of reflecting to experience.

To illustrate this let's look at the following exercise from Hajas Zsuzsa's book *Kommunikációs gyakorlatok 10–14 éveseknek* (Communicational exercises for 10–14 year olds).

“Body proxemics (how far we stand from someone) is part of the harmony of relationships. In the European culture we enumerate four types: the *intimate* zone is up to 45 cm from our body, and this could be entered by the closest people to us. The *personal* zone extends to 1–2 meters, in this area we are connected to acquaintances, friends. The *social* zone is up to 3–6 meters, the *public* zone is more than 3–6 meters.

Try to find out what zone the following persons would choose:

- a friend of yours trying to whisper something to you;
- a teacher in class when hearing the lesson;
- a police-officer checking your identity on the street;
- a costumer who is standing in queue at the ATM machine;
- a costumer who is standing in a queue in the office;
- a pop star at a concert;
- a shop manager catching a ‘costumer’ stealing!”

In this exercise role-play means the playing of different communicational situations as learning activity in order to experience body proxemics. The points of view presented before the exercise proper do not show the knowledge on body proxemics as abstract ones but as angles of reflection on the performance of the activity, thus they create an opportunity for the student not only to experience the communicational situations but, using the appropriate knowledge, to interpret them as well. Knowledge and concepts in this context are not abstract notions, but tools to understand the communicational behaviour by giving viewpoints to interpret the situation.

The goals of communicational games – just as those of the programs aimed at developing thinking abilities – are to experience the different communicational situations in their lifelike nature. In order to make the knowledge conscious, we need to reflect on the situation; “what exactly is going on, what do we do in certain situations and why?” Concentrating on ourselves, our behaviour and thinking in the process of learning has an important role in the discovery and capturing of knowledge.

In the development of abilities the realizing of the importance of knowledge brings closer the approaches built on activities and those based on the balance of abilities, activities and contents. Besides the direct teaching of abilities (in the case of the above example the practice and experience of communicational games and situations), which emphasizes the developing methods regardless of the syllabus and knowledge, the *infusion model* – which means that the abilities have to be developed based on the contents of the syllabus – can be a way of learning based on metacognition. (Maclure-Davies 1991 quoted by Réthy Endréné 1998. 246.)

What is the conclusion of all these? The development of communicational skills based on the infusion model creates the opportunity for the child to reflect on its own linguistic behaviour in the different communicational situation, and find out how s/he thinks about this. In role play there is an exposing of one of the factors of communication, which can strengthen the previous knowledge (yes, it is indeed like this) or can confront the child with a different, conflicting experience (this is not the way I thought it would be).

No matter how great an experience is the reliving and clashing of empirical observations, the phenomenon – if we do not reflect on it and name in on the notional level – is going to be fixed only as an experience. Although experience is an outstanding memory catcher, it is worth it to have it strengthened by making it conscious. That is why we need to find a way to speak about the identified, discovered phenomena and name them as well in order for them to become a part of our knowledge (of course not immediately applying it, because in the case of communication this starts by observing others, it is paired with the will to understand, and then through “catching ourselves”, continued with reflection and attempts to try).

The findings and discoveries of the students need to be specified to enhance understanding and application (they need to be captured on the notional level as well, they need to be named). What other strategy is there to capture, fix these observations? And in this case we have the students in mind, as they need to pronounce, to verbalize their experience to facilitate understanding.

The application of the frontal discussion method would be adequate. We could ask the students what they think, what they experience in the different role-plays as communicational situations, and what their opinion about this is. This we can sum up, outline the conclusions, and write them on the blackboard. Nevertheless this could be the best opportunity to lose what we have gained as there is a possibility to apply role-play as a warm-up and not as a tool to experience, live and understand the question at hand.

What should we concentrate on? If we choose a frontal, directed discussion, not even half of the twenty-some children will be able to express their opinions, and even if they do, they would not express what they really feel in front of the whole class. The discussion and the outlining of the conclusions are going to be carried out with the assistance of the smarter or more daring children. If we write this on the blackboard, we cannot write it as such because we need to use the notions which are unambiguous and according to consensus. If for example we have in mind the role-plays based on non-verbal communication, the table chart could have the following structure: *the tools of non-verbal communication, body-language, body proxemics, its types* as well as short explanations, definitions connected to these. Experience, the discoveries of the children, the personal observations and ideas remain unexploited.

How should we avoid these traps? We could choose indirect lead to the frontal lesson plan: for example debate or other organization and work method. These are the cooperative work-forms: individual, pair or group work.

We can add a very important experience: observations, exercises and problem-solving as well as opinion-formation is not arbitrary: the students need to focus on the actual topic, problem in order to successfully solve it and need to find the method for consensus and agreement. The class as an interpreting community will accept the solutions and opinions which can be confirmed based on the nature of the topic.

This does not mean that the teacher cannot have a harmonizing role. The opinions, conclusions of the group need to be fixed in writing (on the blackboard or on transparencies) in such a way that we organize them in the same time. Based on this experience we can refine the notions introduced as viewpoints for previous observation, knowledge needed for the solving of the problem, as it is obvious that the things and phenomena need to be named in order to avoid misunderstandings in communicating about something.

4. Conclusion

We had the opportunity to see that according to previous pedagogical paradigms and the curricula based on them the basic elements of knowledge, abilities and the activities ensuring their functioning have not been treated as equal, complementary factors in the teaching process. Depending on the approach present in education, the content focal point of syllabi changed according to whether the transmission of knowledge, the performing of activities or the development of activities were in the centre of teaching. All of these had an influence on the content focal point of the classes, on the applied educational strategies and methods as well. In mother tongue education the main point of view is the creation of communicational situations embedded in previous linguistic experiences, which facilitate the realization of the children's previous linguistic knowledge and the development of the communicational abilities with the help of new knowledge, its conscious fixation and infiltration.

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THEORY AND PRACTICE IN THE HUNGARIAN TEACHERS' TRAINING FROM TRANSYLVANIA. INTEGRATION POSSIBILITIES

TÜNDE BARABÁSI*

ABSTRACT. Seit Ende den 90-er Jahren ist parallel mit der lyzealen Bildung auch die Hochschulbildung angefangen.

In diesem Studium präsentiere ich, in welcher Mase und wie die Integration der Theorieausbildung mit der Praxisbildung stattfindet. Die Forschung habe ich in rumänischen Hochschulen durchgeführt. Ich habe untersucht, was für Integrationsmöglichkeiten die Studenten, die Pädagogie- und Psychologielehrer und die Methodisten zwischen Theorie und Praxis in Rahmen des Curriculums sehen. Mein Ziel ist, nicht nur die theoretisch-praktische Möglichkeiten der Integration zu zeigen, die in Fachausbildung benutzt sind, sondern auch dessen Optimalisationsmöglichkeiten.

Since the end of 90's in the primary school teachers preparation in Romania has been introduced the college level parallel with the high school level training.

In this study I would like to show which the real possibilities are, which the former teachers' training high schools, now colleges, give and realize for the integration of the theoretical training and practical preparation, and the extent at which this is realized during the training. In this research work my attention is focused on the Hungarian teachers' training colleges from Transylvania. I examined how students, psychology and pedagogy teachers and practice coordinators see the integration of theory and practice within the framework and possibilities given by the curriculum. My goal was to show which theory-practice integration possibilities are used during the professional training, in order to complete and modernize them through further research work.

The research problem

The proper training for the pedagogical profession is a serious job for the institutions and teachers doing this, due to the continuously appearing and enlarging system of tasks. Naturally, one can not learn for a life long what to teach and how to do it. Though it is very important in teachers' training, to acquire such theoretical knowledge, practical skills and abilities, which are functional and flexible and at the same time such basic notions on which one can build the knowledge gained in refresher courses.

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Thus, in teachers' training, especially in the theoretical training, the educational sciences as well as psychology have a key role. This does not mean that the other subjects are less important. The practical training is as important side of the teachers' training as the theoretical training. Practically speaking neither can be put in front of the other from point of importance, as we can not speak of the efficiency of the primary teacher's work if the mere theoretical knowledge and the skills and abilities which put it in practice are missing. On the other hand, if the stress is put only on practice, on the skills and abilities, this is unfounded, empirical and less conscious. The practical training gives the possibility to gain educational-pedagogical experience, conscious pedagogical practice. It develops the pedagogical abilities.

The theoretical (here: pedagogical and psychological disciplines) and the practical training have such functions, which are indispensable for the whole training and serve to the formation of such a professional competency, which gives the possibility for the a qualitative pedagogical-educational work. But in order to fulfil such functions these subjects must have a proper place and importance in the educational system. They must be embedded in a proper system and last but not least, they must be correlated to the practice in such a way that they should help its realization in a more efficient way, i.e. to make for it.

In this research I would like to show which the real possibilities are, which the former teachers' training high schools, now colleges from Romania, give and realize for the unionization of the theoretical training and practical preparation, and the extent at which this is realized during the training. In this research work the Hungarian teachers' training colleges from Transylvania captured my attention, and I examined how they see the integration of theory and practice within the framework and possibilities given by the curriculum. My goal was to show which theory-practice integration possibilities are used during the professional training, in order to complete and modernize them through further research work. Consequently the present research work has a disclosing character.

The area and the methods of the research:

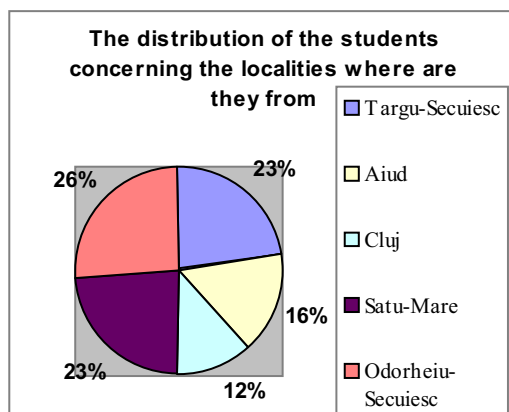
The teachers' training colleges, the Hungarian line, which belong to the Babes-Bolyai University of Cluj: from Târgu Secuiesc, from Cluj, from Aiud, from Satu-Mare and from Odorheiu Secuiesc, form the area of research. The survey was done on the students in the last year, on the teachers teaching psychology and pedagogy and the practice coordinator teachers of the mentioned institutions. Taking into account the number of the questioned people, sampling was not necessary, the survey was a complete range.

The collection of data was done on the basis of a questionnaire. The questionnaire consisted of closed and open questions (12/13 sheets). I used qualitative research methodology in the interpretation of the answers received to the open and some of the closed questions (the coding and interpretation of the answers).

The results of the research

In the course of the processing of the data we synthesized our surveyed groups independently from the localities where they learn/teach. In the cases when we observed great differences, between certain localities, we stressed on them as local particularities.

On the whole 128 students were questioned, all of them being in their last year (3rd year). Their distribution can be seen in the following chart:



The majority of the students (99.2%) answered positively and found the mixing up of theory and practice necessary. (Similar results we can find in the examination of Falus and Kotschy, 1983, in Falus 1997) Their justification is a little bit nondescript since 31.25% could not explain why they found important this integration. We classified the given justification in the following categories:

- Theory and practice have an auxiliary character, they make a whole (A)
- Theory has no sense without practice (B)
- Practice is inefficient without theory (C)
- Due to the integration theory is more intelligible, longer standing, practice is more conscious (D)
- Other (E)

It is interesting to state that the “B” and “C” type answers of the justification appear in the same proportion. The “B” type answers show us that the questioned subjects are pragmatical minded and they consider that the application in practice gives the final meaning to theory. However, those who gave the “C” type answer, the academic minded, emphasized that practice cannot be of a proper quality without theory. Perhaps, all these are not due to the mental constitution but rather to the commitment to protect theory and practice.

The Pedagogy and Psychology teachers, as well as, the practice coordinators equally show that it is important to connect the theoretical knowledge to the possibilities of practical application, that is, the possibilities of practical applications of

the theoretical knowledge should be taken into account at the organization and coordination of the pedagogical practice. They support this idea with the following arguments:

Practice coordinators:

- The theory-free techniques are slow and unsteady
- The teaching activity becomes conscious in such a way, otherwise practice is more empirical
- Otherwise the theory may seem unnecessary
- One becomes a good teacher if he/she puts into practice his/her pedagogical or pedagogical knowledge

Teachers of pedagogy and psychology:

- The practical value of these subjects is important, otherwise they are knowledge for themselves
- The practical oriented training is more efficient, only in such a way this knowledge becomes useful for the students
- There can be formed a dangerous double aspect: the theory is needed only for exams, while the practice is formed only on the basis of experience
- Without enforcement the theoretical knowledge is quickly forgotten

While analyzing these answers we can state that we have to do with the same phenomenon but under other aspect. The basic requirement of a qualitative training is that it needs a theoretical consolidation on which a professionally organized practical activity is built in a proper proportion and relation. We are in front of such a question, which interpreted and coded, is shown at the same extent by the students, the teachers and the practice coordinator. Former researches between participants into teachers training often underline that the students prefer the practical training much more than the theoretical one, that the field experience is more important for them as theoretical coursework (Anderson, 1997); that students see unnecessary the theoretical knowledge in their field practice (Sirotnic, 1990, quote in Ben-Peretz, 1992); that students see much more useful the practice than the courses and seminars (Anderson, 1992). Our results coincide partly with these findings.

As we have seen so far, theoretically every student agrees that theory and practice should appear as a whole, but analyzing the relationship between theory and practice it turned out that all these are realized only partially in their training. Per se it is reassuring the fact that none of the students considers that his/her theoretical knowledge and practical training is totally independent from each other, their proportion of dependence is quite different.

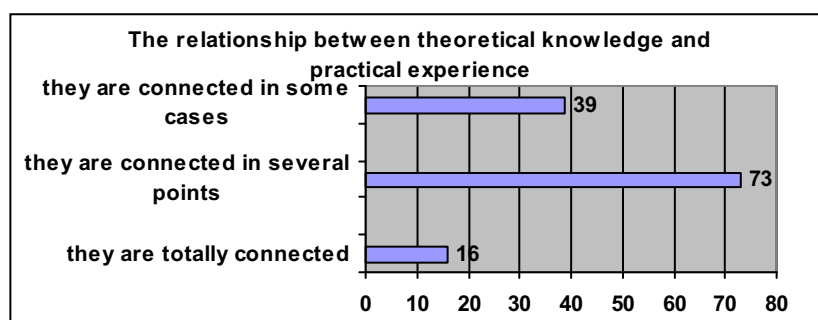


Diagram 1: *The relationship between theoretical knowledge and practical experience*

It can be seen that more than half of the students (57.03%) consider that theory and practice are connected in several point of view, while 30.47% considers that these connections are only accidental. All these show us that the teachers' training can not fulfill the role which is expected from it, that of a "bridge". We can also mention that the 12.5% of the students feel that their knowledge and experience are totally connected. This means that the system of teachers' training has the role of helping the realization of this integration but it depends on the students, too, at a great extent.

This idea seems to be strengthened by the answers of those students who do not wait for the help of the teacher or coordinator in the realization of integration but considers that this must be done by him/herself alone.

Very different answers were given to the question: who helps mostly in the integration of the theoretical knowledge and the practical experience. The methodologists' teachers (49.22%) and the coordinators (44.53%) gave the highest rate, while the pedagogy (12.5%) and psychology (5.46%) teachers gave the lowest rate. However, in a great proportion was given the answer "neither of them" (23.43%), from which some say that he/she him/herself tries to realize the integration. But most of them show that nobody tries really to define the connection points. This phenomenon is seen at the greatest extent in the case of the students from Targu Secuiesc, where from the 29 questioned students 15 answered that nobody helped this connection. Some students (7.8%) answered that the teacher from the primary school helped them at the greatest extent in this integration.

It is interesting to put the answers of the students and of the teachers to this question side by side. The practice coordinators unequivocally say that the coordinator helps mostly the integration of the theoretical and practical subjects. On the second place we can find the primary school teacher's and the pedagogy teacher's answers with the same percentage, while on the third place the methodologist, who in the students' opinion was on the first place. Finally, relatively with a small percentage the psychology teacher is mentioned, who in the opinion of some of the questioned people is not responsible for the realization of the integration. It is also important to state the fact that some of the coordinators answered that it is hard to put into order of importance since each part has its own particular role in the integration. But the following question arises then: whether the manifestation at a small extent of the integration is caused by the fact that its realization is done by several people, and thus the responsibility is shared, too. Whether do we face the phenomenon "Too many cooks spoil the broth"?

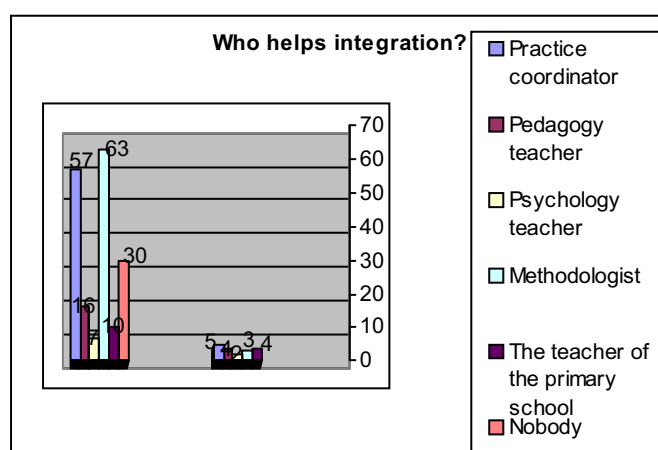


Diagram 2: *Who helps integration?*

These data are also strengthened by the students' answers given to a next question, which show the subjects that are more used during their teaching, that is: which is the theoretical knowledge they can use more profitably during their teaching classes. Several students answer that pedagogy, psychology and methodology are equally important. (62.72%). If we rank the subjects then on the first place come the different methodologies, on the second and the third places the pedagogy and psychology at an equal percentage. In ranking these subjects we have also found differences concerning the five localities of the questioned colleges (This can have the meaning that it is also teacher- and teaching style depending the practical profitability of the courses.).

Analyzing the same question from the point of view of the teachers we got similar answers. Though, $\frac{3}{4}$ of the questioned persons consider that from the point of view of theory and practice integration, pedagogy, psychology and methodology are equally important, when they are ranked the methodologies are put on the first place being followed by pedagogy and finally by psychology. All these also show that pedagogy and psychology teachers feel just partially that they are responsible for the realization of the integration, and they consider it as a prime task of the methodologists. On the basis of the collation of the students' and teachers' answers to the questioner we can say that the teaching of pedagogy and psychology requires a greater practice orientation in the teachers' training colleges from our country.

However, if we do not take into consideration the methodologies and pay attention only to pedagogy and psychology as theoretical subjects, it can be interesting to state which subjects the students consider more useful practically, since these subjects play mostly the integrator role.

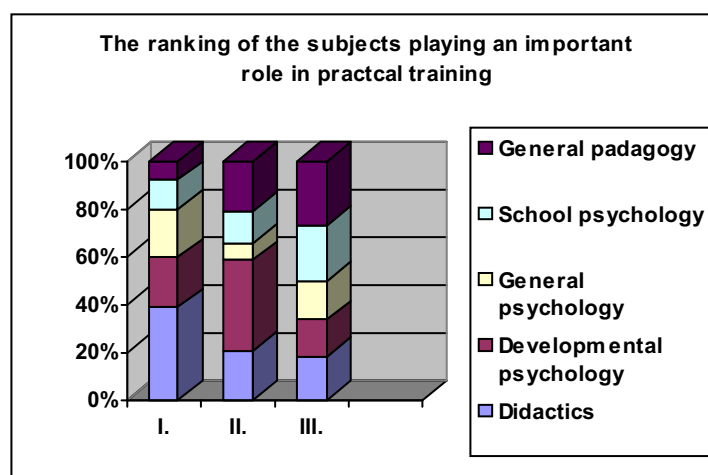


Diagram 3: *The ranking of the subjects playing an important role in the practical training*

Naturally this ranking is determined at great extent by the list of those pedagogical and psychological subjects, which the students study during their formation. Assuming that the more practice-oriented subjects there are the more they would come to the fore, and the basic subjects such as general pedagogy or psychology would stay at the back.

The same question was analyzed in the mirror of the pedagogy and psychology teachers' opinion, too. Though smaller differences were found, it can be observed that the ranking is almost the same.

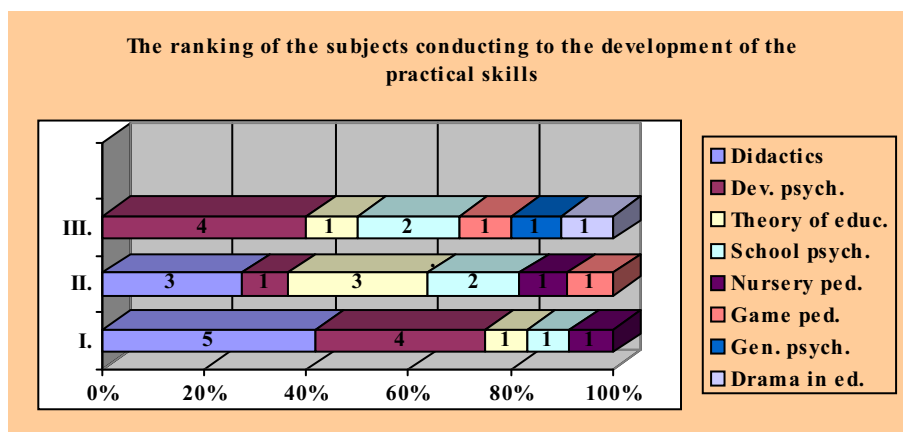


Diagram 4: *The ranking of the subjects conducting to the development of the practical skills from the point of view of the teachers*

So, the teachers of the theoretical subjects state, too, that primarily the didactical and the Developing Psychology knowledge can be mainly used in the practical activities. It is interesting to mention that teachers did not ticked at all or just sparsely, such basic theoretical subjects as General Pedagogy or Psychology, since these are placed on the third and fourth places in the ranking done by the students. It is also important the fact that the teachers mentioned a wider scale of subjects on the whole than the students. What may be the cause of this fact? Why do not see the students the importance of these subjects, e.g.: Nursery Pedagogy or Drama Pedagogy. These questions are to be thought of.

Seeing how important the students consider to be the ‘theoretical’ integration of theory and practice, it would have been expected that to the questions of the type: “Does the theoretical knowledge play a role in the self-evaluation of the probation teaching?” (Question 10) to be answered with ‘yes’ in the same proportion. Despite the fact that the ‘yes’ answers number is greater, there are a lot of ‘no’ answers, too. This may mean that though, the student may understand the importance of the combination, he/she does not practise it. The causes of this must be shown. It is interesting that the students motivated their positive answers in most cases, but the negative cases rarely were motivated. Among these we found such answers as: e.g. ‘I cannot put it into practice’, when I am to do this I have already forgotten the theory’. We quoted the most illustrative ones.

The educational system can be made responsible for all these phenomena, even then when the number of such answers is small. Mostly, theory is considered to be the pivot, a correlation basis, i.e. the basis of the teaching activity.

Besides the evaluation of the probation teaching the students can realize their theoretical knowledge in the following areas, according to the percentage seen in the diagram:

- A – in the preparation of the lesson (exercises related to the content, choosing the method, means, etc.)
- B – in the self-evaluation
- C – during communication with children
- D – in the realization of different pedagogical situations

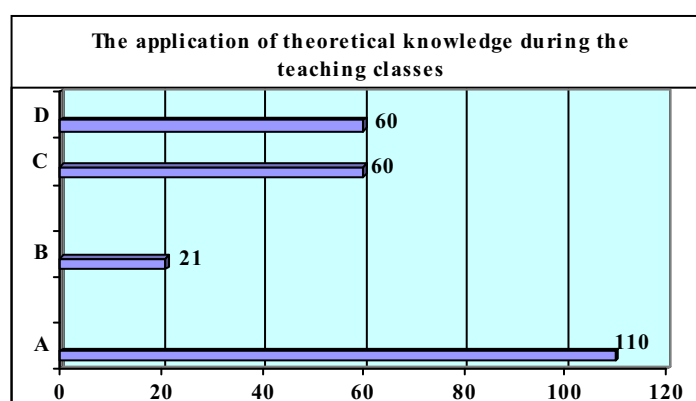


Diagram 5: *The application of theoretical knowledge during the teaching classes*

As it was expected, the students use the theoretical knowledge mainly in the planning phase of the teaching class, that is, it is used when the reflective decisions are taken. When the immediate decisions are taken (answers C and D), it is present, though in a smaller percentage than in the case of the reflective decisions.

As a result of the applied questionnaire those possibilities drew up which the target persons consider efficient in the application into practice of the theoretical knowledge, namely the awakening of the theoretical practical experience to the consciousness of the theoretical level. 27.34% of the questioned persons do not suggest any integration possibility. This high percentage of the missing answers shows that a part of the students are not interested in the fact how the integration and through it the training can be done more efficient.

Among the suggested possibilities we have found the following ones with the percentages of:

- More practice (A)
- More practice-oriented subjects (B)
- Practice-oriented approach/teaching (C)

- The demand for more collective class evaluation, for more reasonable self-evaluation (D)
- A time parallelism and correspondence between the theoretical and practical training (E)
- Others (F)

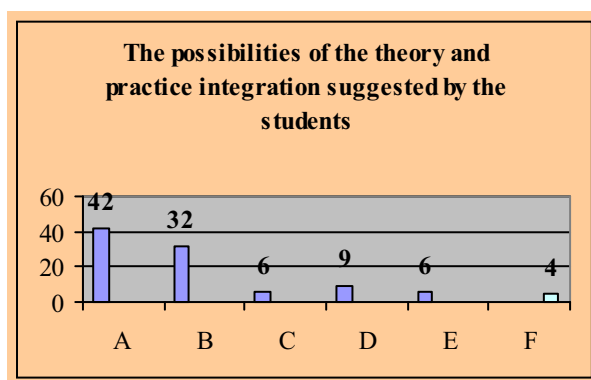


Diagram 6: *The possibilities of the theory and practice integration suggested by the students*

We also analyzed this question from the point of view of the practice coordinators and of the pedagogy and psychology teachers to see how they realize the integration of theory and practice in the area of their activities. We formulated the questions in two directions, having the aim to get an answer concerning the way the theoretical knowledge is realized during the practical training on one hand, and how they build in the students' practical experience into the system of the theoretical knowledge on the other hand.

The coordinators unequivocally consider that they have been thinking of the realization of the students' theoretical knowledge during the practical training. They showed the following ways of realization:

- At the analyzation of certain educational situations (a)
- At the preparation and evaluation of the teaching class (b)
- By the assignment of the observational point of view (c)

The integration in an inverse direction is not so unequivocal. The answers of the practice coordinators split concerning the question whether they follow the way the students realize their experience during the processing of the theoretical knowledge. Obviously, this is more difficult to do especially then when the practice coordinator does not teach theoretical subjects in the given group. Most answers were "the most time" (5), 2 persons answered "yes, always", while 1 person answered "sometimes".

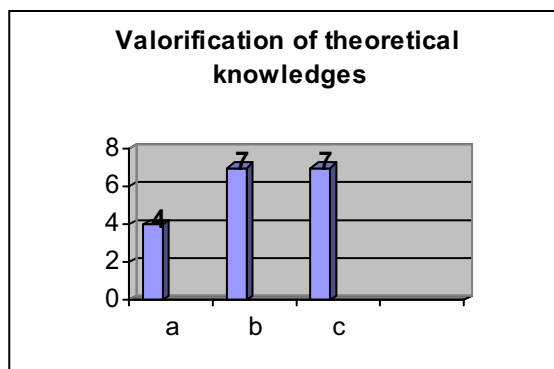


Diagram 7.1: *Ways of integration – coordinators (I)*

The questioned persons showed the following methods of following the students' realization:

- A/ The evaluation of certain pedagogical decisions
- B/ The analyzation and verification of the teaching plan
- C/ The evaluation of the teaching classes
- D/ The writing of such papers which are based on their own experience

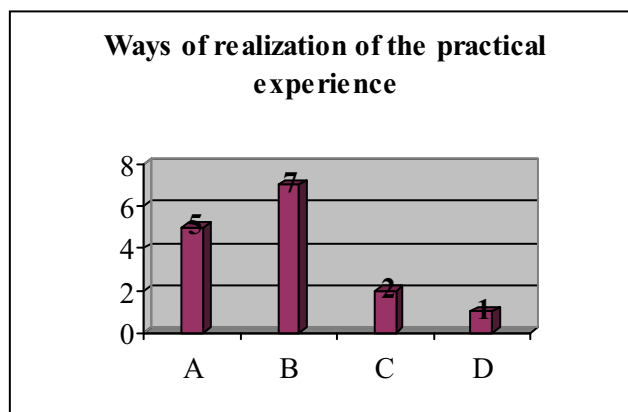


Diagram 7.2: *Ways of integration – coordinators (II)*

The Pedagogy and Psychology teachers have mentioned several methods of combining the taught theory with practice. We find that the methods of integration they use are mostly deductive (concordant with results of Lukács,

Pétriné, and Vámos, 2000). It is interesting to observe that some methods cover such integration possibilities that the students consider necessary. This means that there are made efforts for integration, but these are not in a proper number. Among the suggested combining methods we have found the following ones:

- a) Through examples
- b) Through dramatization
- c) Through reference to observation
- d) Through the evaluation of the teaching classes

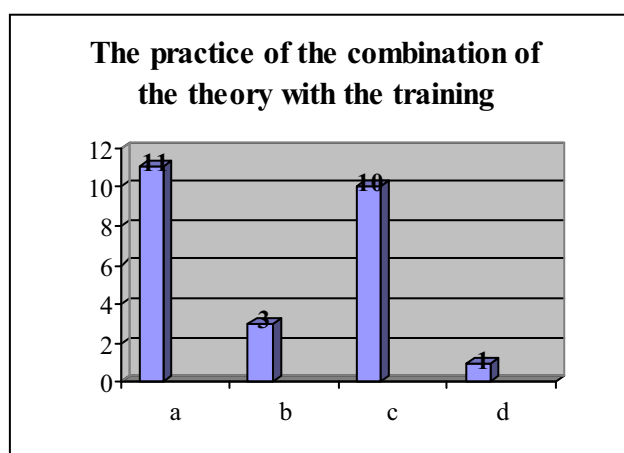


Diagram 8.1: *Ways of integration – teachers (I)*

As the diagram from above shows, the most popular is the use of examples and the reference to observation.

If we inverse the question and take into account the building in of the practical experience into the theoretical knowledge, though $\frac{3}{4}$ of the teachers mentioned that they often were attentive to this, we got such answers that show a kind of seclusion on the part of them. This fact is being motivated by saying that they are not practice coordinators.

This means that there are teachers according to whom it is not necessary to build in the practical experience into the system of theoretical knowledge. This combination must be done only from the theoretical direction.

The questioned persons mentioned the following methods for the observing the students' theoretical knowledge application into practice:

- Through the evaluation of the practice (A)
- During the making of the lesson plan (B)
- Through observational point of view (C)
- The demand of motivations concerning the observed facts (D)

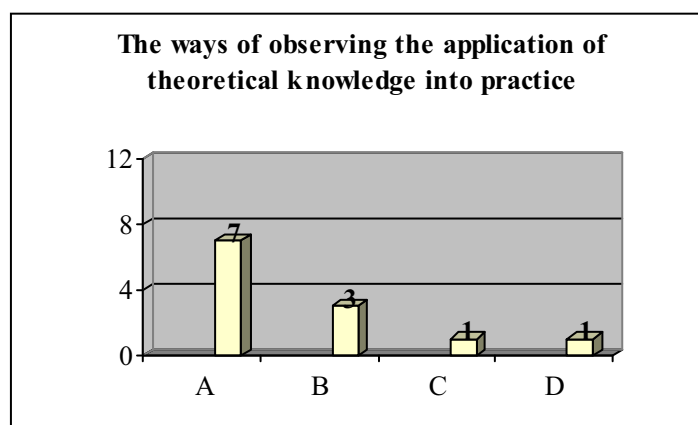


Diagram 8.2: *Ways of integration – teachers (II)*

The relatively narrowness of the answers show us that these methods of observing are not too diverse.

Conclusions

The colleges concerned in the survey mostly show the same picture, and this is why not the differences are stressed but on the common characteristics, which define the particularities of the training. The common features are not given only by the same training profile, but also by the fact that inside the same institution (Babes-Bolyai University – Cluj) they function as affiliated institutions. This means that each college functions with the same curriculum, with the same subject programs and training structure that is decided by the patronizing institution. The specific characteristic of the colleges is different only from point of view of the human resources.

Analyzing the data gathered by means of the questionnaire we tried to show the extent at which the correspondence between the theoretical training (Pedagogy and Psychology teaching) and the practical training is realized, the extent at which the students, the Pedagogy and the Psychology teachers and the practice coordinators see its necessity. We have got some information about those integration possibilities they use continuously during the theoretical and practical training, as well as what other solutions they suggest for the combination of these two projections of the training. We have drawn the conclusions under the following points:

- **The necessity of integration** – the results of the research make us conclude that all the three target groups consider the necessity of the combination of theory and practice to be very important. This means that the value of the both projections of the training is shaped properly, the questioned persons see clearly the role of practice and of theoretical establishment. At the motivation of the

necessity we have found in several opinions the fact theory has an establishing function. Bearing in mind this thing the organized practice is effective and serves the formation of professional competency. It is thought-provoking the fact that 31.25% of the students do not motivate their positive answer.

- **The situation of the integration and its characters** – it may be qualified as a strong discordance the fact that even though the students see, as we have shown before, the necessity of integration, only 12.5% answered that these may be qualified as auxiliary in reality, too. More often they answered that in some cases they combine themselves, and they have several combining points. This result shows that there are efforts towards integration but any way these are not sufficient. It is interesting to point out that the students consider the methodologist the main character, and the teachers have the same opinion. However, the coordinators consider their own activity as an integrator role, while they put the methodologist on the third place. It is a fact that the students put the coordinator on the second place only with a few proportions below the methodologist. As a result we can conclude that at this moment the coordinator and the methodologist realize the strongest integration. In the case of the teaching of theoretical subjects this remains under the expectations. It is shocking the data according to which 25% of the students answered that nobody plays a part in the integration, in this case the students are alone. These empirical data require a faster establishment of a practice-oriented approach during the entire period of the training. The more so as the training structure, the percentage of the theoretical and practical classes and their distribution in time do not always serve at a proper extent the building of the theory on the practice.

- **The practice of the integration** - We experienced that the integration efforts are realized in the first place at theoretical classes. The teachers mention the reference to practical examples, situations as fundamental form of the integration. The use of the students' practical experience and its utilization during the theoretical classes is present at a smaller percentage. The realization of the integration at the level of the practical training appears in our survey as a task for the coordinators and it comes to the fore primarily at planning and at the evaluation of the teaching classes.

- **The optimization of the practice of the integration** - All the three questioned groups said that the extent of the integration and its practice must be optimized. Considering the possibility suggestions we could notice that the questioned persons look for them inside the borders of the material conditions. The students consider important the realization of a more practice-oriented approach, in order to take into consideration their practical experience at the teaching of the theoretical knowledge, and according to the possibilities the teachers should build their work on this.

Concluding, we have shaped a slice of the functioning of the Transylvanian Hungarian teachers' training colleges in this survey. We have met here the germs of the integration efforts, but on the whole we can declare on the basis of the questioned persons' opinion the training can be qualified as theory-oriented. In

order to optimize it is necessary and it is also worth to get acquainted with adaptable techniques from abroad and to build them into the training system. But at the same time we must pay attention to the possibilities of collaboration of those who are responsible for the training thus facilitating the integration.

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