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## RELATION BETWEEN ANDROGYNY AND DEPRESSION

PETROS MALAMIDIS\*

**ABSTRACT.** The present paper subscribes to recent preoccupations regarding the role and implications of gender identity formation upon adaptation and upon pathology implicitly.

In the present study we proposed to investigate mainly the relation between androgyny and depression in the context of two different cultures (Greece and Great Britain). In the design of our study we have included a series of variables which we assumed might have an influence upon this relation, as we have deducted from the specialized literature analysis: the gender of the participants, their sexual orientation and age.

**Keywords:** androgyny, depression, gender identity, sexual orientation

### 1. Introduction

Among all the psychiatric and clinical psychopathological semiotics notions, that of depression is the most frequently used and it includes an extremely varied clinical phenomenology, from mood swings compatible with “normal” life to psychotic manifestations, which evolve together with the disturbance of the affective state and with the striking diminution of cognitive, psychomotor and perceptive possibilities.

Therewith, depression presents a distinct sense and is differently defined according to the psychological orientation under which it is seen. Thus:

- Psychoanalysis sees depression as a diversion of aggressiveness towards the self;
- The behavioral theory considers depression a conditioning defect or a lack of learning ability, supervened after some repeated failures;
- Academic psychology appreciates depression as a cognitive disorder which determines a negative image of the self and a pessimistic, distorted vision of the world.

Depressive moods represent a qualitative change as opposed to the previous ascertainable functioning, “most of the day, almost every day” during at a minimum two weeks. It is also mentioned that this depressive mood is indicated either by subjective narration, either by observation from others.

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There is a series of instruments by which depression can be assessed. The main methods are clinical interviews and scales / questionnaires. BDI-II (Beck, Ward, Mendelson, Mock, Erbaugh 1961; Beck, Emery, Greenbbreg 1985; Beck, Steer & Brown, 1996) is one of the most utilized questionnaires in the screening of depression.

The studies which have investigated the relation between androgyny and depression have revealed the fact that androgynous persons were less depressive than masculine or feminine persons. Cheng (2005) suggests the hypothesis that this fact is due to a better flexibility in utilizing the strategies for coping with stressful situations. Androgynous persons did not have a wider repertoire of strategies, but managed to vary the coping strategies in accordance with situation controllability, regardless of the gender role that had been adopted. On the other hand, masculine or feminine persons had the tendency to vary their strategies according to the gender role they played and irrespectively of the situation controllability.

Some theoretical models suggest that femininity would protect people against depression, against interpersonal stress, and masculinity would prevent depressive symptoms as a reaction to the performance-related stress. As opposed to these, the approach of the schemes of the self implies the fact that women or feminine persons are especially vulnerable to interpersonal stress, while men or masculine persons are especially vulnerable to performance-related stress (Bem, 1975; Beck, Emery, Greenbbreg, 1985).

Conversely, the masculinity model suggests the fact that masculinity, not femininity, is associated with a favorable adaptation regarding all types of negative events.

Cheng (2005) observed that both masculinity and androgyny *correlate negatively with depression*. Androgynous *coping strategies* were associated with a better well-being than instrumental strategies (Bussey, 1983, Bussey, Bandura, 1999). In a study regarding *aggressiveness*, found that androgynous persons were *the most adapted*, being less aggressive and more assertive (Fergusson, Horwood, Beauvais, 1999).

## 2. METHODOLOGY

### 2. 1. Objectives and Hypothesis

A first objective of our study was the investigation of the factors which contribute to the variance of the scores in the *Bem Sex Role Inventory* (BSRI). In this sense, we have taken into consideration the ethnicity of the participants, the biologic sex and sexual orientation. We expect that the gender of the participants be one of the important factors, in the sense that *a bigger number of male participants will have high scores in masculinity and a bigger number of female participants will have high scores on the femininity scale*. (hypothesis 1 a) In what concerns the scores which are classified as androgyny, we assume that *there will be no significant differences between men and women regarding the number of persons categorized as androgynous* (hypothesis 1 b).

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As a part of the same objective of our study we desire the investigation of the hypothesis according to which a bigger number of persons having a homosexual sexual orientation will have higher scores in androgyny, while heterosexual persons will be rather classified as masculine or feminine at the *BSRI*. (hypothesis 2)

There should not be any major difference between participants coming from the two different countries regarding the variant of the scores in androgyny (hypothesis 3).

Since after the age of 25, sexual orientation is quite steady, we do not expect significant differences regarding the number of androgynous persons within the different age categories. (hypothesis 4)

A second objective of the present study consists of investigating the relation between the previously mentioned variables (nationality, sex, sexual orientation, androgyny) and the mood of the participants, more precisely their score in depression measured with *BDI-II*, the well-known inventory for depression suggested by Beck and his collaborators.

Due to the fact that the majority of the studies indicate differences in the incidence of severe depression between men and women, we appreciate that these differences will manifest themselves in our study as well, women generally recording a higher incidence of depression than men. (hypothesis 5)

Moreover, we consider that there will be differences between heterosexual and homosexual persons concerning the scores in depression, in the sense that homosexuals will have higher scores than heterosexuals in this variable. (hypothesis 6)

Considering the depression prevalence rates in Greece and Great Britain stipulated in various studies, we estimate that there will be differences between the participants in our study from the two countries, in the sense that English persons will have higher scores in depression than Greeks. (hypothesis 7)

Weighting these data from the literature, we consider that there will occur differences between androgynous, masculine and feminine persons regarding the score in depression. More specifically, androgynous and masculine persons will have lower scores in depression than feminine persons. (hypothesis 8)

### **2. 2. Participants**

The participant lot was formed of 1000 persons with ages between 25 and 45 years old, randomly selected from different economic and social environments, students, employees, as well as unemployed persons, of very different professions (teachers, artists, farmers, etc) having various religious beliefs.

In the selection of the subjects with ages comprised in this interval, we considered the fact that after the age of 25 sexual orientation is already outlined. Of the 1000 participants, 500 are women and 500 men. Half of the participants are of Greek nationality, and half are English. Half of the participants are heterosexuals, as a sexual orientation, and half are homosexuals/ lesbians.

### **2.3. Design**

The present study is a quasi-experimental one, the comparisons being made in accordance with the hypothesis postulated on the basis of the following *classifying variables*:

- country of origin (Greece, Great Britain)
- sex (male, female)
- age (25-30 years old, 31-35 years old, 36-40 years old, 41-45 years old)
- sexual orientation (heterosexuals, homosexuals).

*Dependent variables:* androgyny, depression

In the present paper, we proposed two major objectives: 1) the investigation of the factors underlying score variance on the *Androgyny* scale; 2) the investigation of the factors underlying the variation scores on the *Depression* scale.

The design of this study is a factorial one of type 2X2X2. In other words, we have three independent variables (country of origin, sex of the subjects and type of sexual orientation). Each of these independent variables has got two modalities, thus resulting 8 study groups that will be compared.

*In the case of the second targeted objective,* we proposed to study the variation of the variable *Depression*, depending on: the score on Androgyny scale; the country of origin of the participants (Greece vs. Great Britain); the sex of the participants (female vs. male); the type of sexual orientation (heterosexuals vs. homosexuals/bisexuals).

### **2.4. Instruments**

In the present study we have employed the following trials:

#### **a) Bem Sex Role Inventory – BSRI**

In the case of the participants from Great Britain, we have applied the original version proposed by Bem (1981), version which is applied at a large scale in this form on the British population. In the case of the Greek population, considering that there is no adaptation of the BSRI on the Greek population, we have made a translation of the inventory proposed by Bem, for which we have made a series of statistical processing in order to verify the psychometric qualities.

*Internal consistency:*

In the case of BSRI applied on the Greek population we obtained an  $\alpha$ -Cronbach coefficient of 0,71 for the “masculinity” scale, 0,81 for the “femininity” scale, which indicates a good internal consistency of these scales.

*Fidelity*

In order to verify the fidelity of the scales, we opted for the split-half method. The correlation coefficients obtained were of 0,69 for the masculinity subscale and of 0,70 for the femininity scale, values which offer the guaranty of stability of the subjects’ scores.

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### b) Beck Depression Inventory (BDI)

Compared to the original version BDI-II is a superior instrument from the point of view of validity. We applied to participants from Great Britain the original version of BDI-II and BSRI which are used in this form at a large scale in this country. In the case of the participants from Greece we used a version of BDI-II and BSRI translated by the author of the present paper, considering that these two tests were not adapted to the Greek population.

#### *Internal Consistency*

We have calculated the  $\alpha$ - Cronbach coefficient of internal consistency for the variant of the BDI-II questionnaire translated into Greek. We obtained an  $\alpha$ -Cronbach coefficient of .87. We present in the table below the results of the correlation inter-item and items total score.

#### *Fidelity*

In order to verify the fidelity of the BDI-II version translated into Greek, we opted for the split-half analysis, obtaining a coefficient of correlation  $r=0,75$ .

The data presented above prove the utility of the instrument for the objectives of the present study.

### 2.5. Procedure

Before the administration of the trials, the participants were informed about the objective of the study and it was brought to their attention that their participation to this study is a benevolent one. The trials have been completed individually by the subjects, the operators providing supplementary explanations where the case.

## 3. PRESENTATION AND INTERPRETATION OF THE RESULTS

Of the total sample of 1000 participants, 232 have scores that situate them in the “androgynous” category, 157 in the “masculine” and 171 in the “feminine” categories. 246 of the participants are situated in the “marginal masculine” category, and 193 are situated in the “marginal feminine” category. In further processing, we totaled the marginal masculine participants with the masculine and the marginal feminine ones with the feminine, due to low frequency of the scores recorded together with taking into account other variables.

Participants have ages ranging between 25 and 45 years old. Approximately 50% belong to the 25-30 years old age group, 30% belong to the 31-35 years old age group, 17% belong to the 36-40 years old age group and the rest to the 41-45 years old age group.

In the initial studies, Bem (1975) noticed that 34% of the men and 27% of the women participating in her study were androgynous. The proportion of men with high scores in masculinity and of women with high scores in femininity was

approximately identical (55% compared to 54%). Only 11% of the men had high scores in femininity and 20% of the women had high scores in masculinity.

If we analyze the results we have obtained, we can notice that they differ quite a lot from the results obtained by Bem in the '70s. Thus, a smaller percentage (22,5%) of men have high scores in androgyny and also, a much lower percentage (6,5%) have high scores in androgyny. Consequently, a higher percentage of men record high scores in masculinity.

The percentage of women who record high scores in androgyny (24%) is closer to the data obtained by Bem (27%), but the number of women with high scores in masculinity is much lower (8,2%). On the other hand, the percentage of women who have high scores in femininity is over 10% higher than the one observed by Bem (54% compared to 67,8%).

The results on the two separately analyzed cultures indicate the fact that the results of the participants from Great Britain resemble more to those obtained by Bem, fact which could also be justified by the greater similarity of the British culture with the one of the United States, in comparison with the Greek culture.

The lot of participants equally comprises heterosexuals and homosexuals.

The lot of participants has been made in such a way that it allows us to control the variables *country of origin*, *sex* and *sexual orientation*, in order to follow mainly the effects of androgyny on score, in the variable *depression*.

The majority of the participants do not have scores that would indicate the presence of depression, having scores which indicate a possible mild depression. Very few have depression of medium or severe intensity.

### **3.1. Factors which influence androgyny**

A first objective of our study has been the investigation of the factors which contribute to the variance of the scores in the Bem Inventory (BSRI). In this sense, we have analyzed the role of participants' culture (country of origin), the gender and sexual orientation role.

According to the first hypothesis, we expected that the gender of the participants influence the score obtained in the Bem Inventory. More precisely, we supposed as a first hypothesis that *a bigger number of participants of masculine gender will have high scores in masculinity and a bigger number of participants of feminine gender will have high scores on the femininity scale*.

Also, we supposed that *there would not be any significant differences between men and women regarding the number of persons categorized as androgynous*.

The results indicate the fact that our hypothesis was confirmed. Indeed, the  $\chi^2$  test indicates the existence of significant differences between female and male participants regarding the scores in "masculinity" and "femininity" ( $\chi^2 = 502,602$ ,  $p < 0.001$ ). A much bigger number of men have high scores on the "masculinity" scale and a significantly bigger number of women have high scores on the "femininity" scale.

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If we analyze the results from the point of view of the number of participants, androgynous women or men compared to the number of participants who are not androgynous (totaling the number of feminine and masculine ones), the  $\chi^2$  test indicates that there are no significant differences between the frequency of women and men who are androgynous, which confirms our hypothesis.

As a part of the same objective of our study, we proposed to test the hypothesis according to which a bigger number of persons having a homosexual sexual orientation will have high scores in androgyny, while heterosexual persons will rather be classified as masculine or feminine in BSRI.

A marginal significant difference was noticed between heterosexual and homosexual participants regarding the scores on the androgyny scale ( $\chi^2 = 5,19, p < 0,07$ ). A bigger number of persons of homosexual orientation (G) have high scores in androgyny and masculinity compared to the ones of heterosexual orientation (H) and a bigger number of heterosexual persons have high scores on the femininity scale compared to persons of homosexual orientation.

Our results are convergent with the ones obtained by other authors (Carlston & Baxter, 1984; Zoccali & colab., 2008) who have remarked the fact that homosexual persons are prevalently characterized as androgynous, having high scores both in masculinity and femininity. This is explained by the respective authors by the fact that probably homosexual sexual orientation leads to a change of the masculine/feminine role and to the adoption of some of the features of the opposite sex.

Heterosexual persons are rather characterized in the traditional gender roles, fact which is considered by a series of authors as a stiffening of the behavior associated to gender role. This stiffening seems to be the explanation offered also for demonstrating certain adaptation difficulties which androgynous homosexual persons deal with better because they have a certain behavioral flexibility regarding the strategies for coping with typically feminine or typically masculine problematic situations.

Concerning the differences induced by the cultures to which the participants belong, we did not expect major differences between participants coming from the two different countries regarding the variance of the scores in androgyny.

The results show that there is a significant difference between the scores in the Bem Inventory among participants coming from the two countries ( $t=2,129, p < 0,03$ ).

If we analyze the data from the point of view of gender identity categories, the differences between participants coming from the two cultures are not significant ( $\chi^2 = 4,03, NS$ ). Thus, there are no significant differences between the two cultures regarding the frequency of androgynous, masculine and feminine persons, which supports our hypothesis.

Concerning the age of the participants, we assumed there would be no significant differences regarding the number of androgynous persons within the different age categories.

There were no significant differences between the studied age categories and the scores in androgyny.

### ***3.2 The Factors which Influence Depression***

The second objective of this study consisted of the investigation of the relation between the mentioned variables (nationality, gender, sexual orientation and androgyny) and the mood of the participants, more precisely their score in depression measured with BDI-II, the well-known inventory of depression suggested by Beck and his collaborators.

A first variable which was investigated was the gender of the participants.

There were no significant differences between men and women regarding the scores in BDI. These results seem to refute our hypothesis, but if we analyze the data from the perspective of the severity of the depression we notice that the majority of the participants in our study do not have a score in BDI-II which would indicate the presence of depression. The differences stipulated in the literature between women and men refer to severe depression, but the data we possess do not allow an analysis of the differences between male and female participants regarding severe depression.

Furthermore, we assumed that there would be differences between heterosexual and homosexual persons regarding the scores in depression, in the sense that homosexuals will have higher scores than heterosexuals in this variable.

There were no significant differences between heterosexual and homosexual persons regarding the scores in BDI. These results contradict our hypothesis. We may try to explain the absence of differences between heterosexual and homosexual persons by the fact that, actually, the majority of the participants have not recorded high scores in depression, 87% having scores that indicate the absence of depression or a mild depression. It is probable that the presence in our sample of a comparative number of participants with medium and severe depression would have modified these results.

Further, we have analyzed the differences regarding the scores in BDI-II depending on the country of origin of the participants.

In rapport with these variables, we estimated that there would be differences between the participants in our study from the two countries, in the sense that English persons will have higher scores in depression than Greeks.

There was a significant difference between Greek and English participants regarding the score on the depression scale, English persons being significantly more depressive than Greeks ( $t=2,269$ ,  $p<0,02$ ).

There were no significant differences between the persons belonging to the different age categories regarding the scores in BDI.

Weighting the data from the specialized literature, we considered that there would be differences between androgynous, masculine and feminine persons regarding the score in depression. More precisely, androgynous and masculine persons will have lower scores in depression than feminine ones. Adopting this hypothesis, we adhere to the model of masculinity which states that those characteristics associated with masculinity are in fact the ones that contribute to a better adaptation of the androgynous persons to the environment, these being characteristics approved and valued by society more than the feminine ones.

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### ***3.3. Analysis of the factors underlying the variance of scores on the Androgyny scale***

Statistical analysis has been conducted through factorial analysis of variance (factorial ANOVA). In contrast with the analysis using *t* tests (which imply the separate comparison of androgyny depending on each independent variable in turn), factorial ANOVA allows the study of the interactions between these independent variables.

The analysis has identified significant differences depending on the country of origin ( $F(1,999) = 6.668, p = .01$ ), on the gender of the participants ( $F(1,999) = 919.458, p = < .001$ ). Furthermore, androgyny is influenced by the interaction between the gender and sexual orientation of the participants ( $F(1,999) = 16.971, p < .001$ ). All these results have an acceptable statistical strength (above 70) which indicates the fact that they did not appear accidentally.

If we analyze these results from the point of view of the proportion of the effect (partial  $\eta^2$ ), we can observe that the only effect worth considering is represented by the effect induced by the gender of the participants. According to this indicator, 48,1% of the dispersion of the variable *androgyny* may be attributed to the independent variable *Gender*. According to the results presented in Table 6.26, men have recorded an average of 15,71 ( $SD = 15,89$ ) and women have recorded an average of 14,4 ( $SD = 15,76$ ).

Concerning the other two significant results, they are not very relevant from the point of view of the proportion of the effect. Thus, the significant differences noticed between Greek and English participants explains the dispersion of the variable *androgyny* only in a proportion of 0,7%. The results presented in Table 6.26 have indicated the fact that the average of the Greek participants was of 2.47 ( $SD = 20.84$ ), and the average of the participants from the UK was of 0.47 ( $SD = 22.72$ ). Although significant, this effect is much too small to conclusion that between the two cultures there are major differences from the point of view of androgyny.

The variance analysis has identified a significant interaction effect between the gender and the sexual orientation of the participants. Although significant, this effect only involves 1,7% of the dispersion of the variable *androgyny*. As one may observe from the figure below, heterosexual men record slightly higher scores than homosexual men. At the same time, heterosexual women record slightly lower scores than homosexual women.

### ***3.4. Analysis of the factors underlying score variance on the Depression scale***

Statistical analysis has been done by factorial covariance analysis (factorial ANCOVA). Unlike the analysis using *t* tests (which imply a separate comparison of androgyny depending on each independent variable in turn), factorial ANCOVA allows the study of the interaction between these independent variables and taking into consideration a covariate variable (in this case, the score of the Androgyny scale).

The analysis has identified significant differences depending on the score obtained on the Androgyny scale ( $F(1,232) = 38.561, p < .001$ ) and depending on the country of origin ( $F(1,232) = 9.661, p = .002$ ). These results have an acceptable statistical strength (above .70), which indicates the fact that they did not appear accidentally. According to this indicator, 14,7% of the dispersion of the variable *depression* can be attributed to the interpersonal differences at the level of androgyny. The relation between these two variables is significant and negative ( $r(230) = .346, p < .001$ ).

The variation of the score on the Beck scale is also due to the nationality of the tested subjects. Thus, this independent variable explains approximately 4,2% of the variation of the variable *depression*. According to the results presented in Table 4, Greek participants have recorded an average of 2.26 ( $SD = 0.69$ ) and UK participants have recorded an average of 2.43 ( $SD = 0.46$ ).

#### **4. THE CONCLUSION**

In order to clarify the results of the various studies dealing with the relation between gender orientation psychological well-being, Whitley (1985) has realized a meta-analysis whose general results best claim the model of masculinity, this latter having a moderate relation both with the absence of depression and a higher degree of adaptation.

Weighting these data from the literature, we consider that there will occur differences between androgynous, masculine and feminine persons regarding the score in depression. More specifically, androgynous and masculine persons will have lower scores in depression than feminine persons.

Covariance analysis has identified significant differences depending on the score obtained in the Bem Inventory ( $F(1,232) = 38.561, p < .001$ ), which confirms our hypothesis. According to this indicator, 14,7% of the dispersion of the variable *depression* may be attributed to interpersonal differences at the level of androgyny.

By the fact that it supports the theories which consider the lack of rigid identification with strict, traditional gender roles, this study supports the benefits of androgynous orientation by the fact that it allows a better adaptation to the environment and it may constitute in a protective factor for depression. Thus, it could represent the basis for the construction of some prevention / intervention programs which would focus on the development of an androgynous orientation that would allow people a greater flexibility in the adoption of several coping strategies, without the boundaries set by the prescriptions of the traditional gender roles.

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## VALIDATION OF CSS - SENTENCE TEST IN ROMANIAN LANGUAGE

RODICA POPESCU\*

**ABSTRACT.** The **CSS Sentence Test** was developed in the desire to have a sufficient number of test sentences for the repeated evolution of speech understanding of CI users. A noise with speech-shaped spectrum on CD allows the evaluation of speech understanding in noise. Sentences were assigned to lists.

**Key words:** *Cochlear Implant, Speech test, Sentence test, Speech understanding*

**ABSTRAKT.** Das **CSS- Satztestmaterial** entstand primär aus dem Wunsch heraus, für die wiederholte Erfassung des Satzverständnisses von Cochlea-Implantat Benutzern eine ausreichende Anzahl an Testsätzen zur Verfügung zu habe. In einer Studie mit 60 normalhörenden wurde die Discriminations-funktion des Tests gemessen. Der CSS –Test wurde über Kopfhörer dargeboten. Die Listen wurden in randomisierter Reihenfolge dargeboten.

**Stichworte:** *Cochlear-Implantat, Sprachtest, Satztest, Sprachverständniss*

### BACKGROUND

There has been progressive improvement in the outcomes achieved with cochlear implantation due to advances in technology together with change in candidate characteristics. There is now international acceptance of the benefit of bilateral cochlear implantation for both children and adults who do not have sufficient contralateral acoustic hearing to use a hearing aid (Briggs, 2010, p. 43-44).

As with hearing aids, persons (children or adults) who receive cochlear implants do not perform in a uniform fashion, given the heterogeneous nature of the hearing-impaired population. The overall habilitation goal for implant users is the development of language. Once the auditory information gets to the brain, there are four levels which can occur. The most simplistic level of processing, *detection*, is the awareness that a sound has been made. The most complex level, *comprehension*, requires both the perception of sound and knowledge of language to interpret the sound. Between these two extremes are the auditory skills of *discrimination* and *identification* (Erber, 1982).

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The ultimate goal of listening practice is always auditory comprehension or understanding through listening. The development of auditory skills is always framed in a language context.

The change in language understanding performance is obtained through the use of test materials.

The CSS (Stanciu, Cotulbea, Ștefănescu) is a Romanian sentence test which was developed to evaluate speech understanding in cochlear implant (CI) users. It is an adaptation of the German-language Hochmair-Schulz-Moser (HSM) test. In order to evaluate speech perception, noise with a speech-shaped spectrum was recorded together with the spoken sentence lists.

## METHODS

The CSS test consists of 30 lists of twenty 3-8 word sentences (106 words total), plus 3 exercise lists of 10 sentences each, resulting in 10 CDs with different signal to noise ratios (SNRs) ranging from +1 to -9 (variants: male and female voices). To assess the difficulty of the individual lists, 30 normal-hearing adult subjects were presented with the lists at the 6 different SNRs (+1, -1, -3, -5, -7, -9) in random order and asked to repeat what they heard. The lists of CSS test were presented via headphones.

## RESULTS

**1. Female voice:** the percentage of correctly repeated words decreased as a function of increased noise levels. The 50% understanding level was found to be at an SNR of -4.

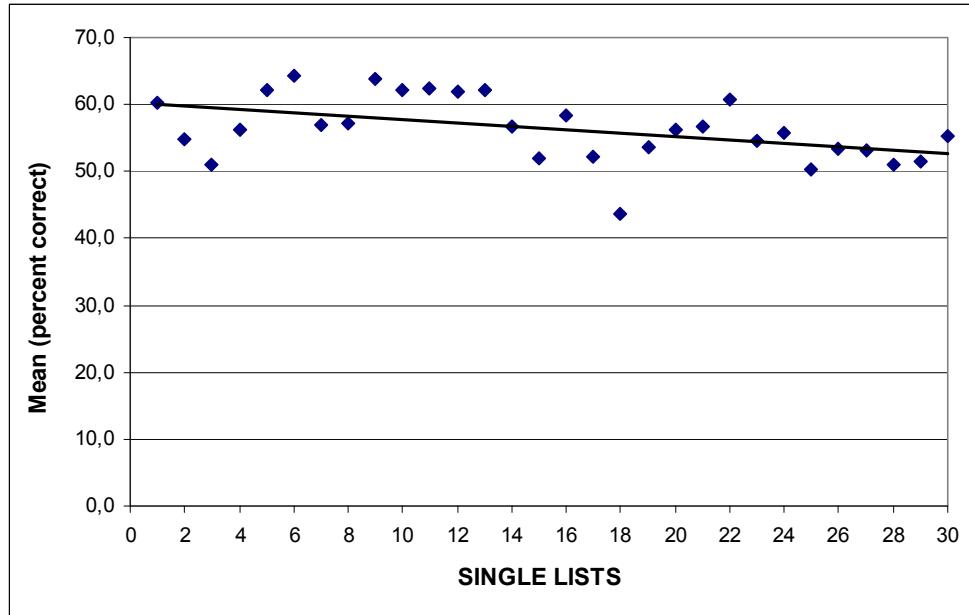
With an SNR of +1 the average percent correct was 92.23%, while an SNR of -9 yielded an average percent correct of 10.56% (SNR -1: 82.17%; SNR -3: 62.96%; SNR -5: 44.41%; SNR -7: 24.19%).

**2. Male voice:** the percentage of correctly repeated words decreased as a function of increased noise levels. The 50% understanding level was found to be at an SNR of -4.

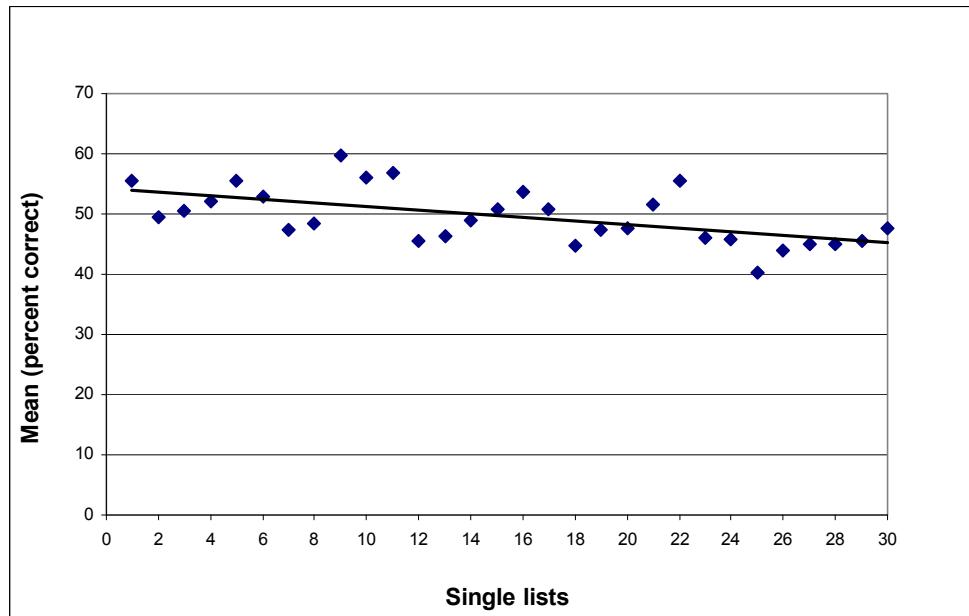
With an SNR of +1 the average percent correct was 78.25%, while an SNR of -9 yielded an average percent correct of 12.79% (SNR -1: 67.86%; SNR -3: 55.47%; SNR -5: 41.40%; SNR -7: 24.59%).

The following figures depict the mean (percent correct) distribution of the single lists:

VALIDATION OF CSS - SENTENCE TEST IN ROMANIAN LANGUAGE



1. Female Voice



1. Male voice

RODICA POPESCU

## CONCLUSION

When compared to our study of the CSS test using a female voice, we found the male voice to be less understandable with lower percentages of correct words obtained by the subjects.

## LEARNING OUTCOME

The CSS test is relevant for the evaluation of adult CI users' speech understanding in everyday life. Due to the different SNRs, it can also be applied with varying degrees of difficulty, as well as compared with sentence tests in other languages such as the HSM (German) test.

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## FEATURES IN STRUCTURING RECEPTIVE MORPHOLOGICAL ABILITIES IN MENTALLY DISABLED CHILDREN

CAROLINA HATEGAN\*

**ABSTRACT.** This research emphasizes the complexity of the morphologic aspect from the assessment point of view, delimitating the necessity and the importance of elaborating new psycho-pedagogical tools that are meant to address language morphologic component from an assessment point of view. The research also stresses on the need of a curriculum that will be focused on developing morphologic competence, even in the context of mental disability, underlining the fact that morphologic abilities, in the context of mild mental disability, at the level of morphologic classes such as the one of the noun, verb, pronoun and preposition are functionally structure, in the receptive language plan.

**Keywords:** *morphological competence, flexible grammatical classes, uncountable grammatical classes, mild mental disability, moderate mental disability*

**ABSTRAKT.** Diese Studie –“Strukturierung der morphologisch rezeptiven Fertigkeiten im Rahmen der Schwachsinnigkeit“ - betont die Vielfältigkeit der morphologischen Seiten aus der Sicht der Evaluierung und zeigt die Notwendigkeit und Bedeutung der Entwicklung von verschiedenen pädagogischen Instrumenten, die den Ansatz von morphologischer Komponente in Bezug auf die Evaluation der Sprache ermöglichen. Die Studie unterstreicht auch die Bedeutung der Vertiefung eines Curriculums, um die morphologischen Fähigkeiten zu entwickeln, auch im Rahmen der Schwachsinnigkeit abfassend dass die morphologische Fähigkeiten im Rahmen der mildere Schwachsinnigkeit, auf dem Niveau einiger grammatischen Klassen als der Nomen, das Verb, das Pronomen und die Präposition die auf rezeptiver Ebene funktional strukturiert sind.

**Schlüsselwörter:** *morphologischer Kompetenz, flexible grammatischen Klassen, nicht flexible grammatischen Klassen, mildere Schwachsinnigkeit, mäßige Schwachsinnigkeit.*

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## 1. Theoretical background

Morphemic structuring is very deficient in the case of the children with mental disability. While the valid child acquires morphemes in the range 3-10 years old, the mentally disabled child presents a great delay at this level of the language. Thus, morphologic development remains incomplete (Popovici, 1994). The same aspect is emphasized by Willis, even from 1975. The above mentioned researcher developed an experimental study that completes the perspective belonging to Laura Lee, (1974), using the same tools she used in order to emphasize morph-syntactical complexity. Laura Lee, (1974) involved in her research 200 participants, all of them being valid children with ages within 3-7 years old range. Willis, (1975) completes her perspective by underlining the way morph-syntactical abilities were structured in the case of the mentally impaired children. The group of participants in Willis's research were divided within three category from the point of view of their chronological age, the group of those of 7, 9 and 11 years.

The tool he used was relatively simple, it focusing on underlining spontaneous linguistic samples complexity, the participants in the research were asked to describe a picture or an image, and their linguistic productions were registered and analyzed. The number of linguistic structures that were to be analyzed was 50. After the linguistic samples were collected, these were analyzed having into consideration the following grammatical categories and aspects: undefined pronoun, personal pronoun, verb (main verb-in Romanian predicative verb and secondary verb-in Romanian non-predicative verb), negation, conjunction, reversible interrogative structures, WH-questions (these are not specific for Romanian language).

Willis, (1975) underlined, through the research he developed, the fact that a child with a 70 % IQ (placed in the category of the children with mild mental disability) reaches a moderate level of morph-syntactic development, numerically expressed 5.99, level equivalent with the one reached by a normally developed child with a chronological age of 3 years and 3 months (the normally developed child involved in this research has a measured IQ within the range 85-115). The development delay that the mentally disabled child has is 3 years and 9 months.

In the case of an 11 years old child with a 70% IQ was underlined a development in the morph-syntactical area that reaches 6.68 points, level equivalent with the one reached by a child with a chronological age of 3 years and 6 months. In this case the delay in development was of 7 years and 6 months.

Popovici, (1994) emphasized the fact that there are important differences regarding morphological abilities among the not typically developed children and the one with mental disability, the researcher underlining these differences with respect to the way those children use prepositions, in years of delay the differences are of one year.

The American researcher (Willis, 1975) underlined the fact that, from the point of view of the morph-syntactic abilities development mentally developed children

included in his research study, with ages of 7, 9 and 11 years old reach developmental level corresponding to the one reached by typically developed children with ages within the range 3-4 years old.

In order to underline the fact that mentally disabled children faces delays but also plateau development at the linguistic level, Willis, (1975) developed a long term research. The data from this research proved that a typically developed child with ages within the range 3-7 years old reaches the following developing levels (morph-syntactic development-conjunctions), in percents (3.5; 6.1; 9.1; 13.4; 18.4), while a child with mental disability with the age within the range 7-11 years old reaches the following developing levels (morph-syntactic development-conjunctions), in percents (17.3; 14.6; 17.7; 11.8). Analyzing these data the following conclusion can be drawn> in the context of the mentally disabled children linguistic development is realized anachronistic marked by plateau and regression periods.

The same aspect is also underlined by the French researchers. These underline the fact that grammatical components are instable in the case of the mentally disabled children, the following grammatical components being numbered (article-morpheme of the grammatical category of determination-Neamțu, 2009) pronoun, auxiliary, prepositions, coordinating and subordinating conjunctions). In using verbal categories, such as time and aspect (grammatical category specific for French) are registered many problems. Regarding the way words are related, mentally disabled child also presents many troubles. Thus, a mentally disabled child uses put together 1-2 linguistic structures at the age of 3, while at the age of 8&9 he can reach the level of 3-4 linguistic structures, for reaching the level of correctly using 5-6 morph-syntactic units. Most of the mentally disabled children combine words through juxtaposition (Rondal; Seron, 1999).

The above mentioned researchers underline the fact that within the range 14-15 years old, mentally developed children do no acquires new abilities concerning morphological development. This aspect emphasizing the existence of several stages that are meant to facilitate linguistic development, stages related with mentally developed child cognitive and social functioning levels.

Even if new acquisitions at morphologic levels are not to be registered in higher chronological ages, the adolescent and the young child with mental disability score high performances at the level of linguistic structures, complexity put in evidence with MLU procedure. Thus, lexical, semantic and syntactic gaining contribute to making linguistic structures more stable and to improving morphologic performances even after 14/15 years old. This aspect was indirectly underlined by Willis, (1975) who spotted that one of the research limits is given by the used tool, this focusing on the necessity of assessing morphological and syntactical development within communicative context through multiple pedagogical tasks, as spontaneous linguistic production is marked by a language characterized through common linguistic structures., relevant for illustrating lexical development, and less eloquent for proving morph-syntactic complexity.

## **2. Experimental design**

### ***2.1. Objectives:***

- elaborating a scale that is meant to allow assessing language receptive component at morphologic level, in the context of mild and moderate mental disability;
- elaborating a set of items based on which the above mentioned scale can be mentioned;
- delimitating the features of morphologic abilities in the context of mild and moderate mental disability, in the range 14-17 years old children.

### ***2.2. Hypothesis:***

- morphologic structuring in the case of the 14-17 years old children with mental disability is characterized through deficient aspects both regarding the countable and the uncountable morphological classes, but also in the case of the derivatives words classes and in the case of the homographs;
- there are significant differences regarding morphologic abilities structuring in the case of the children with mild and moderate mental disability both for the countable and uncountable morphologic classes.

### ***2.3. Participants in the research:***

The study developed on an experimental group of 16 participants with mental disability, 8 of them are diagnosed with mild mental disability and 8 of them are diagnosed with moderate mental disability. These participants have ages compressed in the 14-17 years old range, attending VII<sup>th</sup> and VIII<sup>th</sup> grades.

### ***2.4. Experimental procedure:***

- in the first stage of the research was elaborated an assessment scale for receptive morphologic language component and the pedagogical tasks that facilitate completing the scale;
- participants in the research were selected in the second stage of the research;
- in the third stage experimental data were collected and SPSS experimental data base was elaborated;
- in the forth stage were analyzed and interpreted the obtained results.

### ***2.5. Methods:***

#### ***2.5.1. Explicative arguments***

A scale that facilitates the assessment of the morphologic abilities in the case of the mental disabled children was elaborated within this research study. Having into consideration our previous experience regarding the assessment of language

morphological component (Hategan, 2009), as well as Shorr and Dale's, (1984) observations come out the necessity to elaborate a new tool for assessing morphologic abilities in the case of mentally disabled children, for receptive language dimension.

The majority of the probes and tests consist in a set of images, at least two of them among which the assessed child is asked to indicate the corresponding image for the aimed item. TROG (Test for Reception of Grammar; Bishop, 2003), a test used in Anglophone specialized literature and ECOSSE (Experimental program for grammar assessment; Leqocq, 1996), a probe used in francophone specialized literature are the most common assessment methods for morphologic language component assessment. A similar tool was elaborated and adapted to Romanian specialized field, the probe is entitled PRCMLR (Probe for morphologic categories reception in Romanian language-Hategan, 2009).

The need to elaborate a new psycho-pedagogical tool came out, especially for the mentally disabled children due to their cognitive rigidity and to the bias that they proved when a tool based exclusively on images reflexivity was used (Shorr; Dale, 1984).

The new elaborated tool is made up of two sections:

- the scale for assessing morphologic categories reception;

- a set of items that facilitate the scale completion. These items are elaborated as pedagogical tasks commonly put in practice in therapeutically and educational fields, aspect that contributes to the implementation of the scale, the ones that organize the assessment procedure will not be forced to pass through a training stage in order to get the necessary abilities to use the scale.

The two probes facilitate both the assessment of the receptive and the expressive component of the language, on morphological dimension. Within this study, the focus will be put on the results obtained after completing the scale at the receptive language level; in the future articles these date will be completed.

### *2.5.2 The description of the experimental tool:*

#### *2.5.2.1 The Assessment Scale for Morphologic Abilities-receptive level*

The scale has as morphologic aimed component five grammatical flexible classes (countable classes: noun, verb, pronoun, numeral, adjective), three inflexible grammatical classes (uncountable classes: adverb, prepositions and conjunctions) and two classes that emphasize the tight relation between morphology and lexicology (derived words, homographs), but that are defining for morphologic abilities structuring in Romanian language, having into consideration the morphemic component they include (suffixes, prefixes, stress).

In noun class 14 items are included, these can be delimitated in the following categories expressed in terms of foreseen cognitive-verbal abilities:

- discriminates and identify noun grammatical category with definite determiners;

- discriminates and identify noun grammatical category with indefinite determiners;

- discriminates and identify nouns taking into consideration their number;
- discriminates and identify nouns taking into consideration their gender.

All the mentioned abilities have as corresponding elements different tasks from oral, but also written receptive area, all participants in the research presenting lexical-graphical abilities. The number of items for nouns class are to be found in a greater number as this class is the most frequently used one within the conversational structures emitted by the participants in the research, it being the grammatical class that specialized literature indicates as being well structured, stable even in the cases of moderate mental disability (Popovici, 1994; Pruthi, 2007), thus a complex assessment can offer eloquent data with respect to the mental disabled children's morphologic abilities features.

In the verb class, three items are delimited, they being reunited at the level of single cognitive-verbal ability: discriminates and identify verbal grammatical category. In this way the stress is not put on the different grammatical aspects that compose verbal class: person, number, mode, diathesis, but only on time, it being considered the most important grammatical category, from a pragmatic point of view within the economy of conversational abilities, bearing in mind the fact that instrumental abilities, pre-requisites for oral and written language structuring include abilities that aim temporal planning (Rondal; Seron, 1999; Anca; Hategan, 2007).

In the adjectival category aspects referring to this grammatical class differentiation among others as well as aspects referring to comparison (stressing on comparison degrees). In order to depict those abilities that correspond to the above mentioned abilities, five items were elaborated.

The most used pronominal forms were aimed through the scale- personal and demonstrative pronouns, this based on the aspects concerning language ontogenetic development (Păunescu, 1997; Slama-Cazacu, 1969). For assessment two items were elaborated with respect to the pronominal class.

Quantity reception is assessed through cardinal numeral grammatical category. Within the scale there items are meant to ensure the assessment of the way morphologic abilities structuring is developed with respect to the numeral category.

Adverbial grammatical class is represented through seven items. The bigger number of items is due to the fact that another instrumental abilities are assessed through this grammatical category, they being spatial-temporal abilities (assessed through time and place adverbs) as well as the ability to express manner adverbial features (manner adverb).

In preposition grammatical class two items were formulated, the stress being put on the abilities to establish the propositional expressed relations by using the following structures: "on", "under", "in", "with", as well as on the ability to differentiate and to use composed preposition (in Romania is "de la" preposition, in English it is not a composed preposition and it can be translated "from".

Conjunction grammatical class is assessed through two items, the focus being put on “and”, “or” coordinator conjunctions, there are no items for assessing sub-ordinate conjunctions.

Both the grammatical class of derivate words and the one of the homographs were assessed through two items, morphologic language aspect being related to the lexical one, thse two classes completing noun category.

#### 2.5.2.2 The set of tasks used for facilitating the completion of the scale

The activities comprised within this set of tasks allow collating date about child's performance, the above mentioned items were materialized at least three tasks. The assessor task is to quantify the success regarding a certain item from the scale when the child correctly solves two among the three tasks. Grammatical specialized terminology is not mandatory, it can be specified in the cases when the child knows and uses it (bearing in mind the fact that the participants in this research are in an advanced schooling stage, the VII<sup>th</sup>-VIII<sup>th</sup> grades).

The tasks comprised in this set can be receptive as guiding aspects, the assessor having the possibility to use them when he needs or he has the possibility to use his own working sheets in order to fill the scale with data about the children he works with. This allows the assessor to individualize the assessment and to complementary use the set of task with his own set of school tasks in order to get the best perspective about child's grammatical abilities.

This set is based on common school tasks, fallowing the features of the teaching and of the assessing activities from Romanian school with respect to morphological aspect, features proved by curricular documents (syllabuses, textbooks, curricular auxiliary tools).

### **3. Experimental data analyze**

In order to underline the features of morphologic structuring in the context of mild and moderate mental disability Crosstabulation option from SPSS 17 was used. Thus, mild mentally disabled children prove superior performances in comparison to the one proved by the moderate mentally disabled ones, differences register at the level of all the scale variables. The fallowing tables comprise all the mentioned differences. The best structures morphologic receptive abilities identified in the case of the mild mental disability regard adjectival, verbal, adverbial and prepositional morphological classes. All the items of the scale corresponding to the above mentioned morphological classes are successfully solved by 6-7 participants in the research from the 8 ones.

**Table 1.**  
**Data association for noun class**

	Diagnose		Total
	mild mental disability	moderate mental disability	
S 3.00	0	1	1
6.00	0	2	2
9.00	1	2	3
10.00	1	2	3
11.00	1	1	2
13.00	1	0	1
14.00	4	0	4
Total	8	8	16

**Table 2.**  
**Data association for verb class**

	Diagnose		Total
	mild mental disability	moderate mental disability	
V 1.00	0	2	2
2.00	1	4	5
3.00	7	2	9
Total	8	8	16

**Table 3.**  
**Data association for adjective class**

	Diagnose		Total
	mild mental disability	moderate mental disability	
A .00	0	1	1
2.00	0	3	3
4.00	3	2	5
5.00	5	2	7

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	Diagnose		Total
	mild mental disability	moderate mental disability	
A .00	0	1	1
2.00	0	3	3
4.00	3	2	5
5.00	5	2	7
Total	8	8	16

**Table 4.**

**Data association for pronoun class**

	Diagnose		Total
	mild mental disability	moderate mental disability	
P 1.00	0	2	2
2.00	0	5	5
3.00	1	0	1
4.00	3	0	3
5.00	4	1	5
Total	8	8	16

**Table 5.**

**Data association for numeral class**

	Diagnose		Total
	mild mental disability	moderate mental disability	
N .00	1	1	2
2.00	3	5	8
3.00	4	2	6
Total	8	8	16

**Table 6.****Data association for adverb class**

		Diagnose		Total
		mild mental disability	moderate mental disability	
Ad	5.00	0	4	4
	6.00	2	1	3
	7.00	6	3	9
	Total	8	8	16

**Table 7.****Data association for preposition class**

		Diagnose		Total
		mild mental disability	moderate mental disability	
Prep	.00	2	7	9
	1.00	0	1	1
	2.00	6	0	6
	Total	8	8	16

**Table 8.****Data association for conjunction class**

		Diagnose		Total
		mild mental disability	moderate mental disability	
C	.00	1	2	3
	1.00	4	2	6
	2.00	3	4	7
	Total	8	8	16

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**Table 9.**  
**Data association for derivate words class**

	Diagnose		Total
	mild mental disability	moderate mental disability	
Derive .00	1	4	5
1.00	4	2	6
2.00	3	2	5
Total	8	8	16

**Table 10.**  
**Data association for homographs class**

	Diagnose		Total
	mild mental disability	moderate mental disability	
Homograph .00	3	7	10
1.00	2	1	3
2.00	3	0	3
Total	8	8	16

For underlining differences between the two categories of participants (U) Mann-Whitney Test was applied, using SPSS 17, having into consideration participants' in the research reduced number. Calculating the differences can be draw the conclusion that in the case of moderate mental disability, several morphologic aspects, in a high degree, will never be functionally acquired, stressing the assumption that morphologic abilities in the case of mental disability will never be completed (Willis, 1975; Popovici, 1994; Rondal și Seron, 1999). The research results can complete the above mentioned assumption, thus morphologic abilities structuring will never be completed in the case of moderate mental disability, underlining the importance of structuring a curriculum based on which morphologic abilities can be developed in the context of mental disability, especially in the case of mild mental disability. This curriculum, specially designed lacks in Romanian Educational system, the stress of instruction, regarding Romanian language for mentally disabled children being put on language other components- phonological and lexical component (Hategan, 2009).

The results in U test prove significant differences between the two participants in the research categories, at the level of the following morphologic classes: adjective, noun, prepositions, pronoun, homographs, and verb. These results can be consulted in the following tables.

**Table 11.****U Test results for adjective class**

	Adjective
Mann-Whitney U	14.000
Wilcoxon W	50.000
Z	-2.012
Asymp. Sig. (2-tailed)	.044
Exact Sig. [2*(1-tailed Sig.)]	.065 <sup>a</sup>

**Table 12.****U test results for homographs class**

	Homographs
Mann-Whitney U	14.500
Wilcoxon W	50.500
Z	-2.128
Asymp. Sig. (2-tailed)	.033
Exact Sig. [2*(1-tailed Sig.)]	.065 <sup>a</sup>

**Table 13.****U Test results for prepositions class**

	Prepositions
Mann-Whitney U	9.000
Wilcoxon W	45.000
Z	-2.749
Asymp. Sig. (2-tailed)	.006
Exact Sig. [2*(1-tailed Sig.)]	.015 <sup>a</sup>

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**Table 14.**  
**U Test results for verb class**

	Verb
Mann-Whitney U	11.000
Wilcoxon W	47.000
Z	-2.477
Asymp. Sig. (2-tailed)	.013
Exact Sig. [2*(1-tailed Sig.)]	.028 <sup>a</sup>

**Table 15.**  
**U Test results for pronoun class**

	Pronoun
Mann-Whitney U	6.000
Wilcoxon W	42.000
Z	-2.826
Asymp. Sig. (2-tailed)	.005
Exact Sig. [2*(1-tailed Sig.)]	.005 <sup>a</sup>

**Table 16.**  
**U Test results for noun class**

	Noun
Mann-Whitney U	6.500
Wilcoxon W	42.500
Z	-2.718
Asymp. Sig. (2-tailed)	.007
Exact Sig. [2*(1-tailed Sig.)]	.005 <sup>a</sup>

Highly significant  $p < .01$  were registered for verb, prepositions, pronoun and noun grammatical classes, both flexible and inflexible classes. There are no differences in the case of four investigated grammatical classes: derive words, adverbs, homographs and conjunctions. An explicative hypothesis can be the one

that both categories of participants in the research scored low performances at the level of these grammatical classes, confirming the hypothesis of morphological classes instability in the case of the mentally disabled child (including the mild mental disabled child).

### Conclusions

Comparative approach underlines and confirms the already mentioned aspects that are to be found in specialized literature, the fact that in the case of mental disabled children a plateau period in acquiring morphologic abilities can be registered, as well as a regression one. For confirming this hypothesis, in the present research significant differences between the two categories of participants are calculated for noun and pronoun. These two classes are ontogenetically the quickest acquired classes by the typically developed child. This research also refers to the necessity of a multidimensional approach of language during therapeutically and educative activities, stressing on its morphologic component as it has structural value for cognitive and linguistic development, in general. Thus, morphological abilities training and improving should be developed following a well structured curriculum according to the target group's development features. This curricular planning is extremely important despite the plateau and regression presence and it should represent a psycho-pedagogical priority, it being directly responsible, in the case of the grown up children with mental disability, for linguistic and cognitive development.

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## AUDITORY PERFORMANCES AND SPEECH PRODUCTION OUTCOMES IN COCHLEAR IMPLANTED CHILDREN

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### ABSTRACT. Auditory Performances and Speech Production Outcomes in Cochlear Implanted Children

**Introduction:** Cochlear implantation is a well established treatment option in bilateral severe to profound hearing impaired children who received limited or no benefits from hearing aids. For parents, clinicians and speech therapist(s) the main goal after cochlear implantation is to develop the children's auditory perception and all the skills needed to communicate through spoken language.

**Material, Methods:** We assessed 50 cochlear implanted children using pure tone audiogram for hearing level and global assessment scores like Revised Categories of Auditory Performance and Speech Intelligibility Scale for speech perception and production. We have included in our study only the pre/perilingual patients with minimum 6 months of cochlear implant use. All patients were implanted unilaterally with MedEl devices. The group was split into two groups according to the implantation age, G1, group of children implanted under the age of 5 years, and G2, group of children implanted over the age of 5.

**Results:** After one and a half year of implant use and fitting sessions, most of the patients have had good hearing levels, they reached the 20-25 dB pure tone threshold. The auditory performance was improving permanently after the implant activation. The younger patients had small scores at the beginning but they progressed faster than the older ones. According to estimates, children implanted under the age of 5 years could have an intelligible conversation with a familiar person, about 2 years after implantation and around three years began to speak in order to be understood, perhaps with some difficulty, by people less familiar with their speech. Children implanted after the age of 5 had a slower evolution, they could understand a simple conversation with a familiar person after 2 ½ years of implant use and only after 4-5 years some of them could have a phone conversation.

**Discussions:** Pure tone audiometry is a valuable indicator of cochlear implant functionality and helps adjust the speech processor parameters for a satisfactory threshold on each frequency. Speech and language development is a slow process, both for toddlers and older children. The speech production is a slower process and needs a lot of training with professional speech therapists. The younger children will perform better than the older children who needs more time to reach the maximum level.

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**Conclusions:** Speech development, the most important but the most difficult stage, involves an intensive auditory-verbal training, conducted by qualified persons, training which has to be continued at home, by the family, continuously stimulating the child, motivating him, with a strong effort from all of those who are around the child in order to achieve the best results.

**Key words:** cochlear implant, children, outcomes, threshold, scores

### **ZUSAMMENFASSUNG. Auditory Performances und Sprachproduktion Ergebnisse in Cochlea implantierten Kindern**

**Einleitung:** Die Cochlear-implantation ist eine gute feststellende Option für Kinder mit strenger bis tiefer bilateralen Schallempfindungsschwerhörigkeit, die begrenzenden oder keine Vorteil durch Hörgeräte. Für Eltern, HNO-Ärzte und Reden das Hauptziel nach der Cochlear-Implantation Schallempfindungsschwerhörigkeit ist es, um die Kinder mit der Schallempfindungsschwerhörigkeit und alle Bedürfnisses zu sprechende Sprache zu mitteilen.

**Material, Method:** Wir haben Tonaudiometrische Untersuchung für Horniveau und Global Assisstment Scores like Revised Categories of Audiology Performance und Verständnissprachskala für Schallempfindungsschwerhörigkeit für 50 Kinder mit der Cochlear-Implantation untersucht. Wir haben in unserem Studie nur die prä/perisprochenden Patienten, die minimum 6 Monaten Cochlear-Implantation verwenden, eingeschlossen.

Alle Patienten haben Einsetige Cochlear-Implantation Med-El bekommen. Die Gruppe hat in zweiten Gruppen nach dem Alter geteilt, G1, die Gruppen mit den Patienten unter 5 Jahren, und G2, die Gruppen Patienten über 5 Jahren.

**Ergebnisse:** Seit einem ein und halb Jahr von Implantverwenden und mehrere Anpassungen, die meisten Patienten hatten guten Horniveau vorgestellt, die zu 20-25 dB Pure Tone erreicht haben. Die Horfähigkeit wurde, nach der Cochlear-Implantation Aktivierung, ständig verbessert. Am Anfang hatten die jüngeren Patienten kleine Noten, aber sie hatte viele Progress als die älteren gemacht. In Übereinstimmung mit Wertschätzung, die Kindern, unter dem Alter 5 Jahren Cochlear-Implantation bekommen hatten, konnte eine verständliche Gespräche mit einer vertrauten Person nach dem 2 Jahren über der Implantation haben und rund drei Jahren begann zu sprechen oder um verstanden zu sein, vielleicht mit einigen Schwierigkeiten, die Menschen mit ihrer Rede weniger vertraut. Die Kindern, die nach dem 5 Jahren einem CI bekommen hatten, hatten eine langsamere Entwicklung, konnten sie eine einfache Gespräch mit vertrauten Personen verstehen, nach dem 2 Jahren sie der C.I verwendert hatten, und erst nach 4-5 Jahren einigen von Ihnen konnten eine Telephonesprach haben.

**Diskussionen:** Tonaudiometrische Untersuchung ist ein wertvoller Indikator für die Cochlea-Implantat-Funktionalität und hilft uns der Sprachprozessor Parameter für eine zufriedenstellende Schwelle auf jeder Frequenz zu einstellen. Die Sprech-und Sprachentwicklung ist einen langsameren Prozess, sowohl für kleine Kindern als auch für ältere Kindern. Die Spracherhaltung ist einen langsameren

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Prozess und es braucht viel Ausbildung mit einen professionist Reden. Die jüngeren Kinder werden bessere als die älteren Kinder entwickeln, die mehr Zeit brauchen, um die maximale Stufe zu erreichen.

**Schlussfolgerungen:** Die Sprachentwicklung, die wichtigste, aber die schwierigste Phase, beinhaltet eine intensive auditiv-verbale Schulung von qualifizierten Personen, die Ausbildung, die zu Hause standig fortgesetzt werden, von der Familien standig das Kind stimuliert und motiviert, mit einem starke Anstrengungen aller derer, die rund um das Kind sind, um die besten Ergebnisse zu erzielen.

**Stichworte:** *Cochlear implantation, Kinder, Ergebnisse, Schwelle, Partituren*

## INTRODUCTION

Sensorineural hearing loss is the most common congenital condition, 1 to 3 in 1,000 newborns are diagnosed with this sensorial deficit. Profound sensorineural hearing loss, more difficult to correct with conventional hearing aids, has led to the search for suitable solutions, culminating in the cochlear implant, a semi implantable auditory device, which is surgically inserted in the inner ear and directly stimulates the cochlear nerve, currently the most effective solution for severe and profound hearing loss.

Cochlear implant creates the conditions for receiving sounds, but doesn't provide speech understanding without an intensive auditory-verbal rehabilitation, the most important stage, when the implanted patient is learning step by step to interpret the incoming sound, to imitate these sounds in an more and more elaborate way, developing the speech, more or less close to normal.

Cochlear implant was introduced in our country 11 years ago. In the ENT Clinic of Cluj County Clinical Emergency Hospital the first three cochlear implants were performed in November 2003. From 2003 to 2009 56 cochlear implants were performed, both on children and adults. Most children had prelingual hearing loss, while adults had postlingual hearing loss. Auditory-verbal rehabilitation was done in most cases by speech therapists from Cluj-Napoca's Hearing Impaired Special High School.

This paper is intended to be the assessment of the results obtained by our cochlear implanted children during this period.

## MATERIAL, METHODS

### 1. Study group

The study group consisted of 50 patients diagnosed with pre/perilingual severe to profound bilateral sensorineural hearing loss, unilaterally cochlear implanted in ENT Clinic Cluj-Napoca, from 2003 to 2009.

The inclusion criteria in the study group were:

- Severe to profound bilateral sensorineural hearing loss;
- Pre/perilingual hearing loss ;
  - Unilateral cochlear implant;
  - Experience with a cochlear implant for at least 6 months;
  - Age under 18 years at the implantation moment.

Exclusion Criteria:

- Other hearing loss than severe or profound sensorineural;
- - Postlingual onset of hearing loss;
- - Experience with cochlear implant under 6 months;
- - Age over 18 years at the moment of implantation

## **2. Auditory-verbal assessment of pre-and postoperative cochlear implant patients**

### **2.1. Evaluation of hearing threshold**

All patients were evaluated preoperatively in the audiological department of Cluj-Napoca's ENT Clinic, by pure tone audiometry, auditory evoked potentials (Maico device MB21 and IHS), immittance tests (Hortmann tympanometer), Transient Evoked Otoacoustic Emisions and ASSR (auditory steady state response) (device IHS). Pure tone audiogram was also done preoperatively with hearing aids, in free field conditions.

Postoperatively, after the cochlear implantation, we performed free-field audiometry before every fitting session. Depending on the audiogram profile we've adjusted the speech processor's MCL (most comfortable level) and THR (auditory threshold minimum) values for each electrode in order to improve the speech perception. We took into account or considered the 250, 500, 1000, 2000 and 4000 Hz frequencies, both preoperative and postoperative values from every fitting session.

### **2.2. The global assessment of speech perception and production**

**1).** CAP<sub>R</sub> (Revised Categories of auditory performance) is a score evaluation developed by S. Archbold et al (1995) (1,2) and revised (3) quantifying the patient's auditory skills in the natural context. CAP<sub>R</sub> is a global scale of auditory perception, used especially in cochlear implanted children, which evaluates the auditory performance in a 9-point scale, with increasing difficulty, from no perception of environmental sounds to the ability to speak on the telephone with an unknown person. It is a simple, easy way to evaluate auditory perception in both older and young children. At preoperative evaluation the child was assigned a certain score, depending on the skills, the second evaluation was performed at 6 months after the cochlear implant activation, then at 12, 18, 24 and 36 months. CAP<sub>R</sub>

**Table 1.**  
**Revised Capacities of Auditory Performance Scores**

<b>Revised Capacities of Auditory Performance Scores</b>
1. is unaware of environmental sounds
2. is aware of environmental sounds
3. can identify some environmental sounds
4. can understand a few simple spoken words
5. can understand some common phrases
6. can understand a spoken conversation with a familiar person
7. can understand a spoken conversation with an unfamiliar person
8. can use the telephone with a familiar person
9. can use the telephone with an unfamiliar person

**2).** **SIR** (Speech Intelligibility Rating) is an evaluation score developed by Allen et al. (1998) (4), assessing the individual's capacity to use natural speech in context. It is a five point's scale which assesses the global progress of the child's verbal skills, the absence of spoken language, and the ability to have an intelligible conversation. (Table 2) The child's spontaneous language is assessed observing him while playing or engaging in various activities, while communicating with other children, when looking up a book, etc.

**Table 2.**  
**Speech Intelligibility Rates**

<b>Speech Intelligibility Rates</b>
1 No spoken language
2 Unintelligible speech
3 Speech which is intelligible to a familiar listener in context
4 Speech which is intelligible to a listener with little experience of deaf children
5 Speech which is intelligible to all.

The evaluation was done on a scale from 1 to 5 points depending on the child's abilities, both by direct observation of the child in different situations and based on parental reports. The assessments were made preoperatively then postoperatively at 6 months after that at 12, 18, 24 and 36 months after cochlear implant activation.

The collected data were processed using SPSS 17.0 for Windows and Excel.

## RESULTS

### 1. Demographics data

The study group consisted of 50 patients younger than 18 years at the time of implantation. Age at last evaluation was between 19 months and 219 months, all patients with pre/perilingual sensorineural hearing loss.

The group was split into two groups, G1 ( $N = 27$ ), patients operated before the age of 5 years (60 months) and G2 ( $N = 23$ ), group of patients over the age of 5 at the moment of surgery.

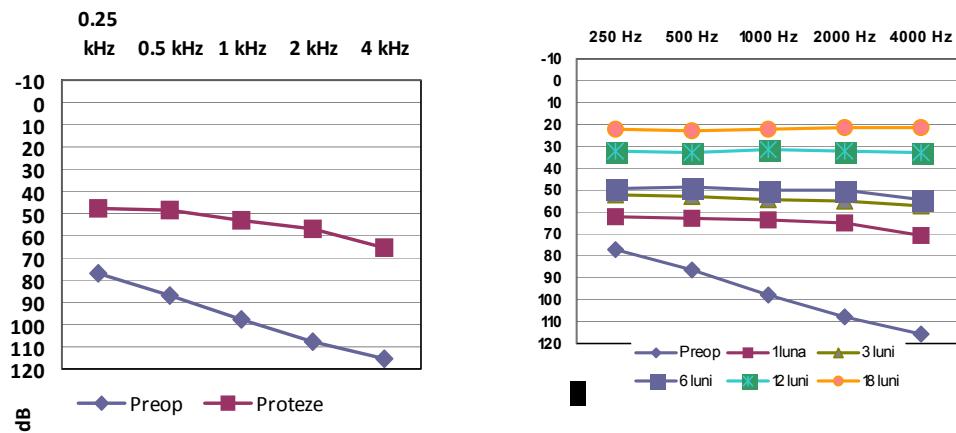
In group G1 chronological age ranged between 19 and 75 months with an average of  $52.30 \pm 19.95$  (months) and median of 53.0 months. Age of implantation ranged between 12 and 60 months, with an average of  $35.44 \pm 12.31$  months and median of 35.33 months. Hearing loss onset was before the acquisition of language, between 0 and 9 months, with an average of  $0.59 \pm 1.92$  months and median of 0.36. The average duration of implant use was  $15.26 \pm 12.78$ , ranging between 6 and 60 months and median of 11.0 months.

In group G2 chronological age ranged between 97 and 219 months with an average of  $133.78 \pm 44.95$  (months) and median of 135.67 months. Age of implantation ranged between 68 and 191 months with an average of  $110.87 \pm 37.73$  months and median of 103.33 months. Hearing loss has been occurred between 0 and 4 months, the average being  $0.35 \pm 0.98$  months and median of 0.27. Duration of implant use was  $21.43 \pm 19.75$ , ranging between 6 and 62 months and median of 13.0 months.

In both groups the etiology of hearing loss was unknown in most of the cases, 48.1% in group G1 and 30.4% in group G2. The second as frequency was the genetic etiology (18.5% to 26.1% in G1 and G2) and then the ototoxic etiology (14.8% to 21.7% in G1 and G2).

## 2. Evaluation of hearing threshold in patients with cochlear implant

The preoperative thresholds were established in our audiology department using the pure tone audiometry with headphones before the surgery, or using auditory evoked potentials and ASSR (Auditory Steady State Response). After the first fitting the thresholds were measured using free-field audiometry.



**Figure 1.** 1A. Audiograms before surgery with and without hearing aids;  
1B Audiograms before and after surgery

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Hearing aided thresholds measured before the surgery have had average values ranging from  $47.56 \pm 6.53$  at 250 Hz to  $65.61 \pm 5.49$  at 4000 Hz. (Fig. 1A) These low thresholds impeded proper perception of environmental sounds and speech. Using the cochlear implant, thresholds improved after each fitting session coming after a year and a half for a 20-25 dB HL on every measured frequency. (Table 3) The differences between measurements were statistically significant ( $p < 0.001$ ), with two exceptions, from 3 to 6 months, for frequencies of 250 Hz ( $2.90 \pm 1.333$ ,  $p=0.641$ ) and 4000 Hz ( $2.70 \pm 1.349$ ,  $p=0.974$ ) when the level improvement was not statistically significant. (Figure 1B).

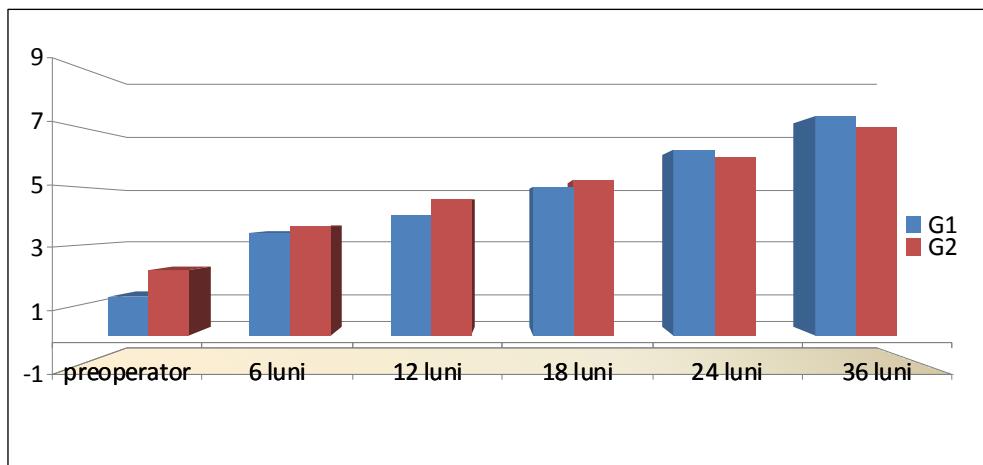
### 3. The overall assessment of speech perception and production CAP<sub>R</sub> Score

**Table 3.**  
Table shows the scores of pre-and postoperative assessments. Preoperative assessment scores had mostly low values (1 and 2), but as the patients were gaining auditory experience these scores increased gradually to maximum values.

CAP	preoperator		6 luni		12 luni		18 luni		24 luni		36 luni	
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2
1	19	5										
2	8	10	4	2								
3		7	11	9	3							
4		1	10	8	7	7	3	2				
5				3	3	3	1	5	2	4		1
6			2	1		2	1	2	1		1	3
7							1	1	1	2	1	
8									1	1		1
9										1	2	
<b>Total</b>	27	23	27	23	13	12	6	10	5	7	1	7

In both groups we calculated the differences in scores from one assessment to another, using Wilkoxon ranks test for ordinal values. Coefficients z and statistically significant p values ( $p < 0.05$ ) showed improvements in both groups, with one exception, in G1 group of small children, where between 2 and 3 years the improvements were not considered statistically significant ( $z = -1.633$   $p = 0.102$ ). (Table 3)

To compare the groups, at every evaluation, we used ANCOVA test which showed us that there were statistically significant differences between the two groups only before surgery  $0.878 \pm 0.187$ ,  $p < 0.001$ , CI 95% =0.501-1.254, while in the other assessments the differences were small with no statistical significance. Before surgery and during the first 18 months the difference was in favor of G2 group. At two years assessment the difference was in favor of the G1, although these differences were not statistically significant (Figure 2).



**Figure 2.** CAP<sub>R</sub> score before and after surgery in the two groups, comparatively; beginning to 2 years assessment the results started to be better in G1 group

Spearman correlation coefficient used for ordinal variables indicated a positive and significant correlation between the CAP<sub>R</sub> score and duration of implant use, moderate for G1 group ( $\rho=0.60$ ,  $p=0.001$ ) and strong for the group G2 ( $\rho=0.866$ ,  $p<0.001$ )

We estimated the duration of use required to achieve different scores. Thus, on average about seven months after cochlear implant use, children operated before the age of 5 years started identifying environmental sounds; about one year after implant activation they achieved the performance to identify some simple words; 2 years after implantation they understood simple conversations with someone familiar. At 3 ½ years, four years, these children could or were able to speak on the phone reach the performance to talk on the phone with strangers, they understood a conversation with a stranger, without lipreading.

Children in group G2 needed more time to achieve high scores compared with children in group G1. In the group of children operated over the age of 5 years at the beginning the performances were better, after a year they understood simple words, after a year and a half they understood simple phrases and after 2 ½ years they could understand a conversation with a familiar person. Between four and five years some of these children could speak on the phone with a familiar person, they could understand a conversation with a familiar voice without lip reading (Table 4).

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**Table 4.**  
**Estimated period of implant use to reach different CAP<sub>R</sub> levels**

CAP <sub>R</sub>	G1		G2	
	Media	Eroarea std.	Media	Eroarea std.
2	6.000	10.643	6.000	9.030
3	7.250	5.322	6.000	7.373
4	10.923	2.952	6.333	7.373
5	20.333	6.145	16.857	4.827
6	24.000	6.145	32.600	5.711
7	39.000	10.643	-	-
8	24.000	10.643	62.000	12.770
9	39.000	10.643	50.500	9.030

**SIR Score**

**Table 5.**  
**Table shows the frequency and percentage of speech intelligibility scores obtained by the patients at each evaluation.**

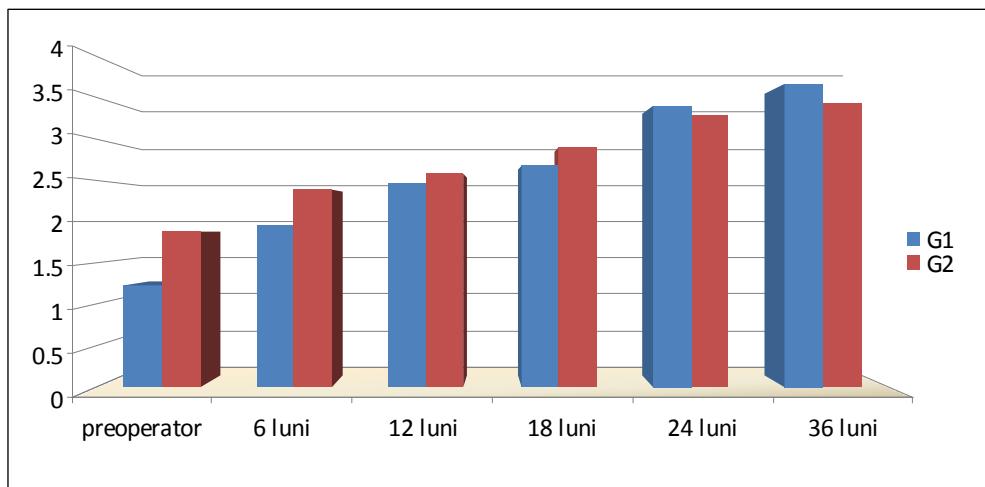
SIR	Preoperator		6 luni		12 luni		18 luni		24 luni		36 luni	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
<b>1</b>	21	8	2									
	77,8	34,8	7,4									
<b>2</b>	6	10	24	14	7	5	2	1				
	22,2	43,5	88,9	60,9	53,8	41,7	33,3	10,0				
<b>3</b>	5	1	9	6	7	4	9	3	5	1	4	
	21,7	3,7	39,1	46,2	58,3	66,7	90,0	60,0	71,4	33,3	57,1	
<b>4</b>									1	2	2	3
									40,0	28,6	22,7	42,9
<b>5</b>	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>27</b>	<b>23</b>	<b>27</b>	<b>23</b>	<b>13</b>	<b>12</b>	<b>6</b>	<b>10</b>	<b>5</b>	<b>7</b>	<b>3</b>	<b>7</b>

Speech intelligibility score increased from one evaluation to another in each group, as shown in table 5.

For each group we analyzed the statistical relationship between scores obtained from one assessment to another, using Wilcoxon ranks test, for ordinal variables. SIR score values increased statistically significant between preoperative and 6 month postoperative evaluations, both in group G1 ( $z = -4.472$ ,  $p = 0.000$ )

and group G2 ( $z = -2.972$ ,  $p = 0.003$ ), then between the 6 months to 1 year assessment, for G1  $z = -2.828$ ,  $p = 0.005$  and for G2  $z = -2.236$ ,  $p = 0.025$ . From one year to 18 months evaluations only G2 group had a statistically significant increase ( $z = -2.000$ ,  $p = 0.046$ ) of SIR score. In G1 group there was a statistically significant increase between 18 months and 2 years evaluation ( $z = -2.000$ ,  $p = 0.046$ ). From 2 years to 3 years assessments the mean score increased in both groups but it was not statistically significant ( $p = 0.317$ ).

To compare the scores between the two groups at each evaluation, we have used the ANCOVA test. The differences were statistically significant only preoperatively ( $0.647 \pm 0.170$ ,  $p < 0.001$ , IC95% = 0.305-0.990) and at 6 months postoperatively ( $0.428 \pm 0.119$ ,  $p = 0.001$ , IC95% = 0.189, 0.668). The differences at 2 years and 3 years assessments were in favor of the G1, but without statistical significance (Figure 3).



**Figure 3.** SIR scores before and after surgery, comparing the 2 groups

The Spearman correlation test for SIR score and duration of implant use, showed a statistically significant, positive and moderate correlation of SIR with duration of cochlear implant use for both groups ( $\rho = 0.736$ ,  $p = 0.000$ , to G1 and  $\rho = 0.609$ ,  $p = 0.002$  for G2).

Children operated in the first five years of life progressed rapidly, reaching an average speech intelligibility score of 4 in 34 months, while older children needed about 4 ½ years to reach the same score.

## DISCUSSION

Pure tone audiometry is a valuable indicator of cochlear implant functionality. Pure tone audiometry performed before each fitting session helped adjust the speech processor parameters, the most comfortable level and the threshold (THR) adjusting them in order to achieve a satisfactory level of threshold on each frequency. These parameters were increased progressively within 12-18 months to give auditory pathway time to develop under the influence of sound stimulus.

Preoperative auditory performance score was lower in the group implanted before the age of 5 years, compared with the group of older children, who had more preoperative auditory training than younger children. Postoperative sound stimulation and the auditory-verbal training improved the auditory performance, the scores were better from one assessment to another; the progress was visible every six months in both groups. Between children implanted before the age of 5 and children implanted at older ages there were statistically significant differences only in preoperative evaluation after that the results became comparable, improving with increasing duration of cochlear implant use, that is proportional to the experience of hearing.

Because of selection criteria older children started with a slight advantage in hearing experience by wearing hearing aids, but this advantage disappeared over time, small children showing faster progression than older children.

Children implanted under the age of 5 years could have a conversation with a familiar person after two years of using the implant and about three years and a half they could use or speak on the phone with unknown persons. Children implanted over the age of 5 years had a slower evolution, they could understand a simple conversation with a familiar person after 2 ½ years of implant use and only after 4-5 years some of them could have a phone conversation.

Speech and language development is a slow process, both for toddlers and older children. Between the two groups there were differences only in the first two years, then the younger children started to have better performance than the older. By using a cochlear implant, because of auditory stimulation, the performance was improving from one assessment to another in both groups.

Development of speech involves not only the auditory stimulation, but an intensive auditory-verbal training, conducted by qualified persons, training which has to be continued at home, by the family, continuously stimulating the child, motivating him, with a strong effort from all of those who are around the child.

According to estimates, children implanted under the age of 5 years could have an intelligible conversation with a familiar person about 2 years after implantation and around three years could begin to speak in order to be understood, perhaps with some difficulty, by people less familiar with their speech. Children implanted at a young age have a chance to learn to speak more properly, clearly, and may reach the performance to be understood by everyone, including people less or not at all familiar with hearing impaired speech.

Children who were operated at an older age and had learned to articulate before implantation need to correct their speech, the manner of articulation, and in many cases, despite a huge effort they don't reach the performances of early implanted children. Sometimes they fail to articulate in a way that can be generally understood and speech quality could be affected.

Children's speech development creates prerequisites to integrate them into mainstream schools, with close-age children. Success of integration depends besides on the auditory perception and spoken language development, on child's cognitive abilities, educational and intellectual level, and family and teachers involvement. Teachers from mainstream schools should know more about these problems, about hearing impaired and cochlear implanted children and they should support these children's integration.

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## **TEACHERS' KNOWLEDGE ABOUT DIFFERENT FEATURES OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER**

**PÉTER ESZTER\***

**ABSTRACT.** The present study examined the teachers' knowledge about three important aspects of Attention-Deficit/Hyperactivity Disorder: symptoms and diagnosis, treatment, and general information. One hundred and eighty-nine kindergarten and elementary school teachers filled out the KADDS questionnaire of Scututto et al. (2000). The scores of the three factors differed significantly from each other with symptoms and diagnosis achieving the highest score. Teaching experience, prior exposure, and self confidence in efficiently working with children with ADHD had a positive effect on the score, while the degree of study did not make a difference.

**Keywords:** *ADHD, KADDS, evaluation of teachers' knowledge, diagnosis of ADHD*

**ZUSAMMENFASSUNG.** Evaluation der Kenntnis von Lehrern über die verschiedenen Merkmale der Aufmerksamkeitsdefizit-Hyperaktivitätsstörung (ADHS). Die Studie untersuchte die Kenntnis von Lehrern über drei wichtige Aspekte der Aufmerksamkeitsdefizit- Hyperaktivitätsstörung (ADHS): Symptome und Diagnose, Behandlung und allgemeine Angaben. Einhundertachtundachtzig Kindergarten- und Grundschullehrer bearbeiteten den KADDS Fragebogen von Scututto et al. (2000). Es ergaben sich signifikante Unterschiede zwischen den drei Faktoren mit Höchstwerten in der Kategorie Symptome und Diagnose. Die Faktoren Lehrerfahrung, Vorerfahrung mit ADHS und Selbstbewusstsein im Arbeiten mit Kindern mit ADHS beeinflussten die erreichten Werte positiv, während das Bildungsniveau der Lehrer keinen Effekt hatte.

**Stichwörter:** *ADHS, KADDS, Evaluation des Wissens von Lehrern, Diagnose von ADHS*

### **Introduction**

Attention-Deficit/Hyperactivity Disorder is the most common behavioral disorder of childhood (Barkley, 2006). It is described in DSM-II as developmentally benign: "The disorder is characterized by overactivity, restlessness, distractibility

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and short attention span, especially in young children: the behavior usually diminishes by adolescence.” (APA, 1968) As a result of many years of study detailed diagnostic criteria have been created. To accurately diagnose a child with ADHD DSM-IV-TR requires that: “Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).” (APA, 2000)

As the child spends a good amount of time with his or her teacher in the school the opinion of the teacher is important. The opinion of the teacher about the child can be expressed in an interview focused on the specific nature of the child’s problems in the school environment or by filling out a questionnaire.

Usually the diagnosis of ADHD is made based on a packet of questionnaires filled out by the parent and the teacher of the child. The parent fills out the Child Behavior Checklist (Achenbach, 2001) or the Behavior Assessment System for Children (Reynolds & Kamphaus, 2004) or the Conners Rating Scales – Revised (Conners, 2001) while the teacher fills out the same questionnaires tailored for them. However it should be clear, that parents’ and teachers’ responses to behavior rating scales are opinions and are subject to the oversights, prejudices, and limitations on reliability and validity inherent in such opinions, but apart from the interview there is no other means of obtaining important standardized information with so little investment of time. Even when children exhibit significant ADHD symptoms both at home and in school the clinician must combine this information with his or her specialized knowledge in differential diagnosis in order to render the ADHD diagnosis. (Barkley, 2006)

The knowledge about ADHD of kindergarten and elementary school teachers is important because the number of children with ADHD diagnosis is increasing (Barkley, 2006) and they will have to contribute to the diagnosis and treatment in school settings of these children. Wehmeier, Schacht, and Barkley (2010) found that 3 – 7 % of school-aged children can be diagnosed with ADHD, and that boys are 2 – 9 times more likely to be affected than girls.

This paper is concerned with exploring the knowledge of kindergarten and elementary school teachers about ADHD. The tool we have chosen to achieve this goal is the Knowledge of Attention Deficit Disorders Scale (KADDS) devised by Sciuotto et al. (2000, 2008). The questionnaire is based on three domains of interest regarding ADHD: symptoms and diagnosis, general information, and treatment. We are interested in the information that the teachers possess and lack about ADHD. We have also measured how the teaching experience, degree of studies, and prior exposure to children with ADHD affects the number of correctly answered questions.

Misidentification and mistreatment of ADHD is a serious issue and thus it is important to measure the knowledge of the teachers in order to be able to correct their misperceptions and provide the missing information.

## **Participants**

One hundred and eighty-nine kindergarten and elementary school teachers (all female) filled out the questionnaire of the study. Out of these, 43.9% taught in kindergarten, 49.2% taught in elementary school and 6.9% did not specify their workplace. Regarding special education, 18.9% taught in special education classes, 73.7% taught in classes without need for special education and 7.4% did respond to this question. The participants could choose between four degrees of study, 1.6% claimed to have no pedagogical qualification, 50.8% claimed to have finished pedagogical high school (13 classes), 13.8% claimed to have a college degree (3 years of study), and 30.2% claimed to have university degree (4 years of study), while 3.7% did not answer. The participants reported an average of 14.21 ( $SD = 11.65$ ) years of teaching experience.

The question about requesting the examination of a child suspected of having ADHD was answered positively by 24.7% and negatively by 69.5% of the participants (5.8% did not answer). Only 32.6% of the participants claimed to have taught children with ADHD.

## **Procedure**

The questionnaire was administered to both Romanian and Hungarian kindergarten and elementary school teachers in their own language, mostly from Cluj Napoca and its surroundings. Filling out the questionnaire takes 20 – 25 minutes. Most of the time after receiving the questionnaire, the teachers took them home, filled them out, and brought them back the next day. They did not have to state their name if they did not wish to do so.

## **The questionnaire**

The Knowledge of Attention Deficit Disorders Scale (KADDS) was devised by Scιutto et al. (2000, 2008). It contains 36 items with three possible answers: true, false, or don't know. The items are all based on well-documented and empirically supported features of ADHD. They represent three major factors: symptoms and diagnosis of ADHD, the treatment of ADHD, and general information about the nature, causes and outcome of ADHD.

As KADDS was originally devised in English and the participants of this study are Romanian and Hungarian teachers, it needed to be translated into Romanian and Hungarian. Each translation was done by two persons with university degrees in Psychology and evaluated for grammatical correctness and understandability by five kindergarten and five elementary school teachers with college degrees in Pedagogy. After this step, the questionnaire was translated back into English by two people who did not know the original. Finally, the four English variants were

examined to see how much of the original semantic content of the questions were preserved. Wherever semantic differences were observed, the translated versions were clarified to better reflect the original semantics of the question.

Finally a pilot study was run with ten kindergarten and elementary school teachers who could make observations regarding the ease of understanding of each item. Their suggestions were incorporated into the final version of the questionnaire.

The questionnaire also included a few demographic questions about the age, gender, years of teaching experience, degree of studies, and prior exposure to children with ADHD. The participants also rated, along a 7 point scale their self-efficacy in working with children with ADHD. Answering to these questions was not compulsory.

## Results

Teaching experience (in years) positively correlates with the number of correctly answered questions ( $r=0.162$ ,  $p=0.032$ ).

The confidence in the ability to teach children with ADHD efficiently does not correlate with teaching experience ( $r=0.137$ ,  $p=0.078$ ), but it correlates positively with the number of questions answered correctly ( $r=0.256$ ,  $p=0.001$ ) and it correlates negatively with the number of questions answered with “don’t know” ( $r=-0.320$ ,  $p<0.001$ ).

Using the Scheffe post-hoc pairwise comparison in ANOVA, there was no significant difference found in the number of correctly answered questions with regards to the four groups based on the academic degrees of the participants ( $F=0.781$ ,  $p=0.506$ ).

The number of correctly answered questions of the participants who had previously taught children with ADHD was significantly higher than the score of the participants who had no prior exposure to children with ADHD, based on the independent samples t-test ( $t=3.082$ ,  $p=0.002$ ). The participants who had prior exposure to children with ADHD answered significantly fewer times with “don’t know” than the participants who had no prior exposure to children with ADHD, as shown by independent samples t-test ( $t=-4.112$ ,  $p<0.001$ ).

With regards to the three factors measured by KADDS, the participants with prior exposure to children with ADHD had significantly higher scores than the participants who had no prior exposure to children with ADHD in the factor of general information ( $t=3.695$ ,  $p<0.001$ ) and the factor of treatment ( $t=2.363$ ,  $p=0.019$ ).

Testing the importance of teaching in a special education class with independent samples t-test found no significant difference in the number of questions correctly answered of the participants who teach in special education classes and those who do not ( $t=1.459$ ,  $p=0.146$ ).

The descriptive statistics of the number of questions answered correctly can be seen in Table 1 decomposed into the three factors.

TEACHERS' KNOWLEDGE ABOUT DIFFERENT FEATURES OF ADHD

**Table 1**  
**Descriptive statistics of the KADDS**

Factor	No. items	Mean	SD
General information	15	5.39	2.50
Symptoms/diagnosis	9	6.08	1.48
Treatment	12	3.97	2.09
Total	36	15.44	4.82

To compare the three factors of the questionnaire (general information, symptoms, and treatment) ANOVA was used with Scheffe post-hoc pairwise comparison that indicated that the scores achieved on each factor differed significantly from each other ( $F=51.071$ ,  $p<0.001$ ). The symptoms/diagnosis factor has the highest score that is significantly higher than the score of the general information factor that in turn is significantly higher than the score of the treatment factor.

It is interesting to examine the items that were answered correctly, incorrectly or with "don't know" most of the time. The first five items answered correctly by most participants are shown on Table 2.

**Table 2**  
**The five most common correctly solved items.**

Item no.	Content of item	Factor	%
9	Children with ADHD often fidget or squirm in their seats.	S/D	96.8
26	Children with ADHD are disorganized.	S/D	88.8
3	Children with ADHD are frequently distracted by extraneous stimuli.	S/D	87.3
21	It is necessary for a child to exhibit relevant symptoms in two or more settings in order to be diagnosed with ADHD.	S/D	83.0
16	Current diagnosis of ADHD identifies two clusters of symptoms: inattention and hyperactivity/impulsivity.	S/D	79.3

The five items that were mostly solved incorrectly are shown on Table 3 where the percentage of correct answers is shown in increasing order.

**Table 3**  
**The five most common incorrectly solved items.**

Item no.	Content of item	Factor	%
34	Behavioral treatment of ADHD focuses primarily on attention problems rather than non-compliance.	T	6.3
1	ADHD occurs in approximately 15% of school-age children.	G	10.5
23	Reducing dietary intake of sugar or food additives is effective in reducing symptoms of ADHD.	T	10.5
4	Do ADHD children tend to be more compliant with father than mother?	G	12.6
27	ADHD children have more problems in novel than in familiar situations.	G	13.7

The five items that were answered with “don’t know” most of the time are shown on Table 4.

**Table 4**  
**The five most common items answered with “don’t know”.**

Item no.	Content of item	Factor	%
35	Is Electroconvulsive Therapy an effective alternative treatment for severe cases of ADHD?	T	75.6
6	Is there a family history of ADHD (i.e. first-degree relatives)?	G	63.4
15	What are the side effects of stimulant drugs used for treatment of ADHD?	T	62.9
12	What are the long-term outcomes of ADHD following treatment?	T	60.8
23	Reducing dietary intake of sugar or food additives is effective in reducing symptoms of ADHD.	T	58.2

## Discussion

The results of our study are similar in the most salient features to the results of Scututto et al. (2000) that introduced the KADDS instrument to measure the knowledge and misperceptions of elementary school teachers about ADHD. Also the literature review of Murray (2009) depicts a similar picture over all the studies that have addressed the question of teachers’ knowledge about ADHD.

It is not surprising that the teaching experience gathered over many years and the confidence in the ability to teach children with ADHD have a positive effect on the number of correctly answered questions.

It is interesting to note from a pedagogical point of view that the academic degrees obtained by the participants did not influence the number of correct answers. This can be explained by the fact that the participants are not evenly distributed in the four categories of academic degrees. More than half of the participants who provided information have a pedagogical high school degree and their teaching experience is significantly higher than the rest of the participants, as shown by independent samples t-test ( $t=3.680$ ,  $p<0.001$ ). It is probable that their teaching experience compensates for the lack of higher academic degree.

As expected, exposure to children with ADHD significantly increases the number of correct answers, but the symptoms of ADHD are known just as well by the participants with no prior exposure to children with ADHD. This result offers support for the validity of KADDS.

Children with ADHD attend regular schools so the participants who teach in special education classes have less exposure to them and so their knowledge about ADHD is not significantly different from the knowledge of participants who teach in normal education classes.

## TEACHERS' KNOWLEDGE ABOUT DIFFERENT FEATURES OF ADHD

The result that the participants of the study know the least about the treatment of ADHD is explained by the fact that they have no direct knowledge about the treatment of their students. In the best case, the medication treatment is accompanied by behavior modification techniques during which the therapist asks for the opinion of the teacher in form of reports, but the medicinal treatment is sometimes not revealed to the teacher by the parent.

The participants scored highest on the symptoms and diagnosis of ADHD factor because either they have direct experience with this facet of ADHD or they can easily gather information from the media about these issues.

Regarding the items answered correctly most of the time, three of the top five can be found in the top five of Scιutto et al (2000), four of the five items answered least correctly can be found in the corresponding list of Scιutto et al, and three of the five items answered usually with "don't know" can also be found in the corresponding list of Scιutto et al.

As ADHD is one of the most frequent psychiatric disorders among school-aged children (APA, 2000) and its frequency is increasing it is important to enrich and deepen the knowledge of the professionals working with children affected by ADHD through trainings and workshops.

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## EFFECTS OF KNOWLEDGE-BASED INFERENCES TRAINING ON PRIMARY GRADE CHILDREN WITH READING DISABILITIES

VIOREL MIH<sup>\*</sup>

**ABSTRACT.** Student development and use of effective reading comprehension strategies is one of the most important goals for content area reading instruction. Therefore, strategy instruction should be part of the total school curriculum, and students should be taught to apply strategies in various content area classes. Students with reading disabilities in primary school grades need assistance in content reading to integrate new information with their prior knowledge, to obtain important information from the text, and to remember what they have read. Thus, content area reading instruction is an important component of curricula and includes strategy instruction in comprehension skills. The purpose of this article is to assess the impact of introducing inference training to less skilled comprehenders. Children 3-ed grades, classified as skilled or less skilled comprehenders, were instructed on how to make inferences from and generate questions about a text over a period of seven sessions. Comparison groups of control and experimental were trained in standard comprehension strategies. The experimental group showed a significantly greater improvement in inference generation than the control group. It is concluded that the value of explicitly teaching children inferential skills is that the enjoyment of the task of reading is enhanced and is therefore more likely to be undertaken readily, even by pupils who may have initially found reading difficult.

**Keywords:** *inference, reading, text comprehension*

**ZUSAMMENFASSUNG.** Eines der wichtigsten Ziele des Unterrichts ist die Entwicklung und die Anwendung der wirksamen Lesestrategien. Somit müsste das Erlernen der Lesestrategien ein wichtiger Teil des Schulcurriculums sein, denn man müsste Schülern ganz konkret unterrichten, wie sie diese Strategien in verschiedenen Kontexten einsetzen können. Schüler aus den Klassen 1-4, die Lese- oder Verstehensschwierigkeiten aufweisen, brauchen Hilfe, wenn es um die Integration der neuen Informationen in deren Wissensbasis, um den Auswahl der Hauptideen des Textes oder um die Erinnerung an dem Gelesenen geht.

Der vorliegende Artikel nimmt sich vor die Auswirkungen eines inferenziellen Trainings bei Lesern mit Verstehensschwierigkeiten zu evaluieren. In diesem Sinne hat man mit Schüler einer dritten Klasse sieben Trainingseinheiten durchgeführt. Die Schüler sind je nach ihren Verstehensfähigkeiten in verschiedenen Gruppen eingeteilt worden (gute Leser vs. schwache Leser) und haben gelernt Inferenzen zu

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ziehen und anhand einiger gelesenen Texte Fragen zu formulieren. Bei der Gruppe hat man eine bedeutende Verbesserung der Fähigkeit Inferenzen zu ziehen festgestellt. Abschließend kann man sagen, dass es möglich ist Fertigkeit Verstehen durch Training (Inferenzen) zu verbessern, so dass man die Leseaktivität, auch bei Kindern die anfangs Leseschwierigkeiten aufwiesen, in eine angenehme Beschäftigung umwandelt.

***Schlagwörter:*** Inferenz, Lesen, Textverständnis

The process of generating inferences is central to most mental operations (Cain., Oakhill, Barnes, & Bryant, 2001; Garnham & Oakhill, 1996; Long, & Chong, 2001; van den Broek, 1994). Thus, according to Rips (1988) it is common for all forms of thinking. Therefore, research on generating inferences has practical relevance apart from the field of reading. For instance, children invest the world around them with meaning by making inferences about differences and similarities between what is new to them and what they already know (Cain, 2003; Hansen & Pearson, 1983). If we refer to reading, on the one hand an inference results from linking the content of the text with the knowledge base of the reader and, on the other hand, forms the associations that the reader makes between the information read in the text and the products resulted from prior information processing. The capacity to make inferences is the ability to use two or more pieces of information from a text in order to arrive at a third piece of information that is implicit. Inference can be as simple as associating the pronoun 'she' with a previously mentioned female person. Or, it can be as complex as understanding a subtle implicit message, conveyed through the choice of particular vocabulary by the writer on the reader's own background knowledge. Inferencing skills are important for reading comprehension, and also more widely in the area of literary criticism and other approaches to studying texts (Kispal, 2008).

Most of the prior research on reading argues that knowledge plays a primary role in understanding text. Thus, it was considered that the extent of text comprehension depends on the lexis size and the subject's knowledge base represents one of the most important indicators for successful understanding (Long et al., 1996; Casteel, 1993). Cain et al. (2001) also underlined the indispensable role of general knowledge: indeed, relevant background knowledge for a passage is a better predictor of fourth graders' ability to generate inferences from and elaborate on that text than is their comprehension skill. The relationship between background knowledge and inferencing is not reciprocal. Elaborative inferences cannot be drawn without the prerequisite knowledge. However, just because a reader has that background knowledge does not automatically guarantee that the reader will necessarily make the inference (Kispal, 2008). Swanson (1999) conducted a metaanalysis based on 95 studies on the effects of training, which targeted the influence of lexical abilities on text comprehension. He found a significant effect of instructions regarding vocabulary

on understanding the text one has read. Stahl & Jacobson (1986) argue that the training based on knowledge improves, but this **does not eliminate** problems about understanding. Moreover, Trabasso & Magliano (1996) explains the importance of basic lexical training for generating inferences and implicitly, for improving comprehension. He considers that the general knowledge base of the reader and his prior knowledge related to the content of the text he has read represent very important preconditions for understanding written text. Surely, the knowledge base represents a crucial premise (absolutely necessary condition) for understanding a text. Without understanding basic concepts from the text or the formulated questions, a person cannot construct inferences. But, as the study by Pressley & El-Dinary (1997) concludes and many other studies from this field support, a person's knowledge about reality is not sufficient to produce effective understanding.

Effectively understanding a text implies combining the size of the knowledge base with the subject's ability to adequately combine this information. Consequently, there are students who have a knowledge base that is comparable with that of students of the same age but who have serious difficulties in operating with this knowledge in ecological conditions (McNamara & Kintsch, 1996).

In the present study we aim (a) to develop the optimal ability to use knowledge (generating inferences) in pupils who are less skilled comprehenders (LSD) and at the same time (b) to evaluate the degree of knowledge transfer. In order to increase the participation of students in the instruction process, Rosenshine & Meister (1994) recommend teachers to adopt a pro-active attitude. In order to augment the engagement levels of pupils we designed a generative intervention program (similar to that proposed by Witrock, 1989). This involves engaging participants by writing summaries and offering generating responses. We believe that this kind of activities will significantly improve text comprehension. A generative model implies that the student discovers some linguistic elements concerning location, timing, action, motivation etc. A second type of support consists of the methods derived from the concept of reciprocal teaching (Lederer, 2000; Reutzel & Cooter, 1991). The procedure requires a reciprocal exchange of roles between teacher and student. Thus, the teacher is not only the person who models and teaches, but he also answers questions and learns, and pupils take on the teacher role. The theoretical background of this procedure is based on the concept of "proximal development zone" developed by Vygotsky (1978). The author suggests that cognitive functioning first emerges at the social level (inter-psychological), and only later is transferred to the individual level (intra-psychological). Starting from the theories of Vygotski and Wretsch, Palincsar & Brown (1984) designed the method of "reciprocal learning" with the aim of improving reading. The intervention based on the mentioned method, implies interactive learning through games, where the instructor and the student successively conduct a dialogue based on a text fragment. Initially, the teacher is the one who addresses questions, summarizes and makes predictions for each studied fragment. Gradually, the student takes on the role of the teacher, through a progressive

delegation of responsibility from the teacher to the student. Lederer (2000) and Pearson (1985) present a series of advantages of such a role exchange. The hypothesis of the present study is that the inferential training based on reciprocal inferences generation will improve the text comprehension capacity through generating a series of inferences by the LSD.

### **Method**

*Subjects.* A number of 24 LSD took part in the experiment. The age of participants varied between 9 and 10 years old. They were pupils in four schools (two from Cluj and two from Sighet). Half of the students were included in the experimental group and the other half in the control group. The pupils were selected based on the scores they received at the comprehension tests (TCC, Mih, 2004). Thus, only students with scores in the first four normalized classes were included. The period allocated to reading instructions was 50 minutes.

*Experimental design.* We used a multifacotrial design. The independent variable was the group type (experimental or control), and the dependent variables were the scores from the tests. There was no significant difference between the two groups in what concerns the initial comprehension abilities  $t(22)=0.84$ ,  $p > .69$ . The training was conducted by four trainers, who were Pedagogy students. Data were analyzed in accordance with a set of research questions derived from the formulated hypotheses.

**Table 1.**  
**The lesson about inferences generation**

1. Lesson	Location deduction	Children were taught to generate inferences about location were it happen an event.
2. Lesson	Subject deduction	Children were taught to generate inferences about person who made a thing.
3. Lesson	Timing deduction	Children were taught to generate inferences about time when an event it happen
4. Lesson	Action deduction	Children were taught to generate inferences about action a person made
5. Lesson	Causal deduction	Children were taught to generate inferences about who / what made an effect or a result.
6. Lesson	Effect - cause deduction	Children were taught to generate inferences about an effect or a result of one action.
7. Lesson	Recapitulate	It takes again above inferences.

*The trainers instruction.* The four trainers involved in the study participated in two instruction sessions prior to the experiment. These sessions were conducted by the authors. Trainers were asked not to talk to each other during the experiment about the teaching methods or lessons content. The four trainers were trained separately,

namely two were instructed concerning one teaching method and the other two received training on the other teaching method. This was done in order to avoid the possible contamination that would have resulted from collective training.

Tutors from the two groups received the lesson content and the instruction procedures corresponding to each lesson. The trainers from the control group received the content for 7 lessons they had to teach in a classical way. On the other hand, tutors from the experimental group received the same lessons, but the teaching method they were instructed to apply was a generative one. They were instructed on the quality of explanations, demonstrations and spontaneous examples. Also, the importance of providing detailed descriptions of the inferential operations and not just labeling them (i.e. action) was emphasized.

*Instructional procedures.* The two groups (experimental and control) participated 7 days, at the interval of one week in 50 minutes sessions and received reading instructions. Trainers received assistance through guiding instructions depending on the occurring problems.

*The experimental group.* The content of the lesson regarding the generation of inferences was designed to include 6 deductions (inferences) selected from a set of 10 deduction types proposed by Johnson & Johnson (1990). The content of each lesson is synthesized in table 1. Each lesson comprised 4 instruction stages.

- (1) *Introduction.* In this section of the lesson, the tutor introduced a new inference category and summarized the inferences that were taught previously. The students identified the key words for elaborating the inference. They themselves also generated short passages, similar to those provided by the teacher. Afterwards, the teacher explained the correctness/error of the inferential response offered by the student. The teacher emphasized the vocabulary indicators identified by the student as well as the ones omitted while generating the inference. The aim of the exercise was to highlight the function of the different text components (lexis) in the elaboration of inferences.
- (2) *The objectives and motivation for the lesson. Modelling.* The objective of each lesson was presented by the teacher so that the students should be informed on the method that they can be helped to particularly understand some materials and become better readers. Based on the different passages, the tutor exemplified the target inferential ability and also, explained the role played by this skill in the reading activity. Moreover, the tutor demonstrated the way in which a certain skill can be learned. The responsibility to gain new knowledge was gradually transferred from the tutor to the pupils. Also, the trainer constantly evaluated the extent to which the students understood the information that was taught.
- (3) *Practice and application.* In this stage of the lesson, the students played the role of detectives. They had the task to look for certain key words that would justify the deductions that were made. Thus, the method of

generating inferences was applied. The students were initially grouped in pairs. In the beginning, each student had made a list of key words corresponding to the type of deduction that was taught that day and also during the previous lesson. Based on this list, pupils generated their own passages. Each student generated and highlighted the key words in the passages generated by other students. They made an inference and at the same time explained the inference that formed the basis for that particular passage. The student who wrote that passage would tell him/her if the inference was correct or not.

- (4) *Offering feed-back.* At this last stage of the lesson, a discussion was initiated and conducted by the teacher. Often, he would use passages generated by the pupils as examples for the other participants from the group.

*The control group.* The tutors who were allocated to the control group taught the students basic sequences of the lessons, using the usual teaching methods.

*Evaluation materials.* In order to build the two students groups, the TECC was applied in the beginning. In parallel, 3 comprehension tasks that targeted the following dimensions were developed: (a) an immediate transfer task, (b) a distal transfer task, (c) an inferential responses task (offered for the questions based on a passage).

(a) *The immediate transfer task* comprised 12 short passages (grouped two by two), corresponding to the six types of inferences for which the training was made. The passage was followed by one question that asked the pupil to generate a specific inference. The generated inference was one of location, timing, object, etc. One point was given for each correct answer to the questions. Answers were coded by two persons (instructors) who were trained to do this.

(b) *The question-answer task.* This task was elaborated starting from two passages that comprised 100-150 words each. This corresponded to a third grade difficulty level. Each passage was followed by two literal questions (answers could be found in the text) and three questions that targeted the generation of inferences (responses could be offered based on combining information in the text with those from the knowledge base of the subject) (Pearson & Johnson, 1978). One point was given for each correct response. The maximum score for the literal questions was for and for the deduction questions was six.

(c) *The distal transfer task.* The task was developed based on two text passages of 100-150 words each. The difficulty level was evaluated by two instructors to be suitable for the third grade level. Similar to the task from point b, each passage was followed by two literal questions and 3 deductive questions. The coding scheme was the same as for the previous task.

*Evaluation procedures.* The four evaluations were made at the end of the training phase. The first 3 tasks were applied two days after the training. The transfer test was applied one month after the training in order to measure the long-term duration of the training strategies.

## Results and discussions

In order to measure immediate transfer and long term transfer ANOVA was used.

**Table 2**  
**Comparisons of transfer task by group**

Evaluation types	Question types	Group types		t	p
		Experimental group	Control group		
The procedural transfer	Inferential questions (max= 12)	M σ	8,64 (2,15)	6,43 (2,24)	2,59 .02
	Literal questions (max= 4)	M σ	3,53 (0,67)	2,81 (0,83)	2,34 .05
The immediate transfer	Inferential questions (max= 6)	M σ	4,12 (0, 91)	2,98 (0,80)	3,26 .01
	Literal questions (max= 4)	M σ	3,24 (0,45)	2,38 (0,81)	3,95 .01
The distal transfer	Inferential questions (max= 6)	M σ	4,32 (0,67)	3,18 (0,65)	3,22 .01
	Literal questions (max= 4)	M σ	3,11 (0,45)	2,65 (0,54)	2,43 .05

Table 2 presents the means and standard deviations of the results in the two groups of participants with low comprehension abilities (from the control and experimental conditions). Results correspond to the evaluation tasks presented above. The effect strength of the training procedures on the two participants' groups resulted from the use of the „t” test.

The table 2 shows the presence of significant differences between the two groups of pupils for more tasks. The results of the study demonstrate that following the inferential training, SD showed improvement for the following skills: (a) key words identification in the text, (b) generating a list of words and personal passages, (c) the transfer of knowledge gained for solving deduction passages generated by others, (d) inferential transfer for unfamiliar materials. The effect of the generative intervention task was reflected in the superior performance of the experimental group, for more types of inferences like: action, cause and effect deduction. On the other hand, results for location deduction and timing were not influenced by the training tasks.

Data analysis from table 2 imposes the general remark: the skills learned following the training (a) identifying key words, (b) linking content form the text with the knowledge base and (c) inferential text elaboration starting from the key words offered by the tutor are transferable. The transfer effects can be observed in the responses of the pupils to the inferential questions corresponding to the used tasks. It is

important to highlight the fact that the effects of the generative training were maintained in time. Consequently, we conclude that the training based on the described algorithm significantly improves the inferential skills of less skilled comprehenders.

Results lend support to data from previous studies from the field (Reutzel & Cooter, 1991). The mentioned authors name a series of experimental data to prove that the significant improvement of comprehension happens following a sustained training that involves time investment (Gersten, Fuchs, Williams, & Baker, 2001). The second observation concerns that fact that important acquisitions will not significantly deteriorate with time. It is possible that a training that involves a longer period of time will highly improve the participants' performance. Results based on the proposed procedures can be further tested in inferential studies for other knowledge, highlighting the role of inferential transfer in improving the comprehension activities.

The study also emphasized the fact that not all types of inferences that were taught are influenced to the same extent by the training procedures. We bring three arguments to explain the discriminative influences of the instruction procedures: (a) first, it is possible that the duration of some tasks was too short, (b) second, the used training procedures could have needed high complexity level processing that were above the actual operating capacity of LSC. (c) third, it is possible that the instructions for generating the six types of deductions were not explicit enough.

It is important to highlight the fact that even though the study focused on the improvement of generating inferences, an unexpected effect of improving literal questions performance was registered. A possible explanation is that the proposed procedure implies different processing levels. Consequently, the first phase focused on a superficial processing level, namely on the literal text form. Only afterwards, more advanced processing levels were required. This differentially influences the literal and inferential understanding. From the analysis of the study tasks such a phenomena does not emerge.

We conclude that higher performances at the literal and inferential tasks of the participants from the experimental group can be explained by: (a) looking for important information in the text, (b) the implicit effort to link information from the text with the knowledge base, (c) generating inferences based on some passages elaborated by others.

All these operations imply a deeper level of text processing, with beneficial consequences for retaining information for longer time periods.

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**PSYCHOMOTOR DEVELOPMENT, SOCIAL-EMOTIONAL  
FUNCTIONING, QUALITY OF THE RELATIONSHIP  
WITH THE CAREGIVER AND MENTAL HEALTH  
IN EARLY CHILDHOOD, UNDER SEVERE RISK**

**CARMEN COSTEA-BĂRLUȚIU\***

**ABSTRACT.** Interpersonal relationships are essential in early childhood and adaptation to interpersonal stress constitutes one of the main adaptive tasks during this period. Sixty-eight infants and toddlers at severe risk were included in our study, in order to investigate the impact of the relationship with the primary caregiver on the child's psychomotor development and mental health. We found significant associations between mental health status and psychomotor development, relationship functioning and psychomotor delay, as well as between social-emotional functioning and severity of the child's developmental delay. Several implications for the clinical practice with infants and toddlers were derived.

**Key words:** *infant/toddler mental health, relationship with the caregiver, social-emotional functioning, psychomotor development.*

**ABSTRAKT.** „**Psychomotorische Entwicklung, gesellschaftlich-gefühlsmäßige Arbeitsweise, Qualität der Beziehung mit dem Pfleger und psychische Verfassung in der früheren Kindheit unter ernster Gefahr**“- Die zwischenmenschlichen Beziehungen sind wichtig in der früheren Kindheit und die Anpassung zu zwischenmenschlicher Stress bezeichnet eine der wichtigsten Anpassungsaufgaben dieser Zeit. Neunundsechzig Säuglinge und Kleinkinder mit ernster Gefahr wurden in dieser Studie einbezogen, um die Auswirkung der Beziehung mit dem ersten Pfleger der psychomotorischen Entwicklung und psychische Verfassung zu untersuchen. Wir haben bedeutende Assoziiierungen zwischen der psychischen Status und die psychomotorische Entwicklung, wirkende Beziehung und psychomotorische Retardation, als auch zwischen, gesellschaftlich-gefühlsmäßige Arbeitsweise und die Ernsthaftigkeit der Retardation des Kindes gefunden. Einige Auswirkungen für das klinische Praktikum mit Säuglinge und Kleinkinder wurden abgeleitet.

**Schlüsselwörter:** *psychische Verfassung des Säuglings/des Kleinkindes, Beziehung mit dem Pfleger, gesellschaftlich-gefühlsmäßige Arbeitsweise, psychomotorische Entwicklung.*

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In a psychodynamic perspective, infant and toddler mental health disorders originate in disorders of the relationship between the child and the caregiver, namely the mother (Emde, 1983). Maternal rejection, anxiety, hostile motherhood, aggression from the mother lead to infantile psychosomatic disorders that affect the child's development. The impossibility of maintenance of an emotional relationship with the mother, the insufficient interaction determine the occurrence of increasingly severe symptomatology (Parke, 1992). Emde (1983) considers that maternal deprivation is the most important factor that affects infant development, while deprivation in other areas (either sensory or motor) can be compensated by the adequate relationship with the mother.

More recent theories of development confirm that the lack of social interaction in the first years of life has important effects on the child's development later in life (Stack, 2004). Though a number of factors from the child's environment are associated with non-organic developmental disorders, among which nutrition holds a privileged place (Pollitt, Gorman and Metallinos-Katsaras, 1992), if the child's emotional needs are being met and proper treatment is insured where necessary, the child can overcome certain obstacles encountered on the developmental path, such as malnutrition, without severe sequelae.

Child institutionalization, though unrecommendable, can become a valid alternative to a disordered mother – child relationship, especially if a proper maternal substitute is found for the child (Bornstein and Tamis-LeMonda, 2004). Thus, maternal deprivation does not necessarily have to be a causal factor for child psychopathology.

Child development in the light of the attachment theory occurs in the context with the sensitive and responsive relationship with the primary caregiver. The attachment figure, that needs to be a consistent presence in the first years of life, fosters development by the three main functions it holds: (1) it represents the target for the proximity seeking behaviors, (2) it constitutes the child's „safe heaven” in difficult periods, (3) it represents the child's „secure base”, allowing the child to fulfill his/ her needs in a safe environment (Mikulincer and Shaver, 2007, Wallin, 2010). According to attachment theory, the real or expected disappearance of the attachment figure generates separation distress. As a reaction to stress, the increase in cortisol level may lead to perturbations in neural functioning, that leads to deficits in the mental functioning, with consequences on the child's adaptive capacity (Mircea, 2008). On the other hand, the interaction with significant persons attenuates the activation of autonomous nervous system and the hypothalamic – pituitary – adrenal axis during stressful experiences, holding regulatory influences on the perception of threat at the cerebral level (Coan, 2008).

According to Bowlby (Bretherton and Munholland, 2008), from the cradle to the grave, the human being mental health is strongly related to the relationship with attachment figures, that provide emotional support and physical protection. Early social relationships influence and are being influenced by developmental psychopathology (DeKlyen and Greenberg, 2008), as they influence the central processes involved in it: construction of cognitive - affective expectancies, emotional and behavioral

regulation ability, stress coping strategies. Attachment security was considered, in the light of the above mentioned arguments, important factor of resilience (DeKlyen and Greenberg, 2008, Weinfield et al., 2008). The influence of attachment on psychopathology needs to be considered within the child and family ecology, the adult's capacity to deliver the responsive and sensitive care that the child needs is strongly influenced by the context (stress, financial difficulties, frequent residence change, violence within the proximal environment) and the way that the mother – child dyad adapts to difficulties in their environment needs to be approached in future research (Kobak and Madsen, 2008).

As a consequence of research on the effects of maternal deprivation on the children, reactive attachment disorder was included in the third edition of the DSM and special attention to early childhood mental health issues was considered necessary, leading to fulminant development of the infant mental health field. The Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (Zero to Three, 1995, 2005) is considered an important step forward in this field (DeKlyen and Greenberg, 2008), as it includes a special axis on which the parent – child relationship functioning is assessed. The revised edition of the manual used the term „deprivation/ maltreatment disorder” to replace the nosologic category „attachment disorder” specified by the DSM.

As the association between early childhood mental health issues and child development is indisputable and deriving from practical necessities, our study aimed at analysing the association between psychomotor delay in infants and toddlers at risk and mental health issues, in the context of parent – infant relationship quality, child emotional and social functioning and characteristics of the family environment and psychosocial stress. We hypothesized that: (1) the psychomotor delay is significantly higher in children from inadequate social environments, compared to children from adequate environments, (2) the psychomotor delay is significantly associated with the quality of the parent – child relationship, (3) the psychomotor delay is significantly associated with emotional and social functioning of the child, (4) the quality of the parent – infant relationship is significantly associated with the emotional and social functioning of the child.

## **Method**

### ***Participants***

Sixty-eight hospitalized infants and toddlers were selected for a larger study. The whole sample of children came from atypical social environments and suffered from various forms and degrees of malnutrition. Children with severe neurological disorders (cerebral palsy), sensory disability and acute illnesses were excluded from the study sample, with the purpose of obtaining a homogenous sample. Ethical principles, referring to confidentiality, avoidance of stigmatization and discrimination, non-intrusiveness of assessment were respected.

The age variance was 2 to 27 months, with a mean age of 8.40 ( $\pm 5.59$ ), a similar percentage of male children (55.9% of the total number) and female children (44.1%). The sample distribution based on the severity of malnutrition was: 8.8% of the total sample presented first degree malnutrition, 2.9% degree I/II (included in the group with first degree malnutrition), 40.6% second degree, 15.9% degree II/III and 31.9% third degree malnutrition.

### ***Instruments and procedure***

*Developmental level* was established on the basis of semi-structured observation (Costea-Bărluțiu, 2010) for five areas: (1) gross motor; (2) fine motor; (3) cognitive; (4) language and (5) social-emotional. The difference between chronological age and developmental age was considered developmental delay in each area.

*Infant mental health screening* was performed by means of The Mental Health Screening Tool (children 0 to 5 Years), MHST 0-5 (California Institute for Mental Health, 2000). Detailed *assessment* of infant mental health status was achieved using both the DSM-IV-TR (American Psychiatric Association, 2000) and the multiaxial scheme from the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood, original and revised editions (DC: 0-3/ DC:0-3R, Zero to Three, 1994, 2005). The five axes of DC:0-3 are: (1) Clinical disorders, (2) Relationship classification (Parent-Infant Relationship Global Assessment, PIR-GAS), (3) Medical and developmental disorders and conditions, (4) Psychosocial stressors, (5) Emotional and social functioning. The assessment tool was designed specifically for the assessment of mental health in early childhood, it is a developmentally oriented instrument that provides a diagnostic profile of the child, guiding the intervention. The assessment was performed during several meetings with the child (3 to 5 observations, 30-60 minutes each) in different contexts and situations and the fulfillment of criteria for a clinical disorder was interpreted as a risk and not as a label for the child. Close cooperation with the child's pediatrician and hospital personnel was essential for the assessment process.

The statistical package used for data analysis was SPSS 13.0 for Windows, statistical procedures were performed according to the study objectives and the type of data gathered. We used Kruskall-Wallis (H), Pearson correlation (r), Cramer's (V) tests and regression analysis ( $\beta$ ), depending on the variable type and the required processing.

### **Results and discussion**

All the infants and toddlers in our study were admitted to hospital with nutrition disorders and we found that most of the children presented various degrees of *psychomotor delay*, quantified as the difference (in months) between chronological and developmental age within five areas: gross motor, fine motor, cognitive, language and social-emotional. Of the five areas investigated, language was the most affected

for the children included in our sample, proving that whereas motor development may progress even in the case of children coming from atypical environments, language development is most probably affected in the case of children lacking the adequate scaffolding.

The severity of psychomotor delay was not significantly different in male and female children ( $p>.05$ ) and was significantly higher as the degree of malnutrition increased, but only for language [ $H(3)=7.81$ ,  $p=.05$ ] and social-emotional [ $H(3)=11.39$ ,  $p=.01$ ] developmental areas, whereas in the case of gross motor, fine motor and cognitive areas the differences were not statistically significant ( $p>.05$ ).

We analyzed the impact of the caregiving environment characteristics on the child's psychomotor delay within the five developmental areas, considering three main characteristics: (1) family economic conditions (precarious/ poverty vs. acceptable/ above poverty level), (2) family cultural level (low vs. medium), (3) family living conditions (inadequate vs. adequate housing). As all the children in our sample came from atypical social environments, the differences at the level of the above mentioned characteristics are small.

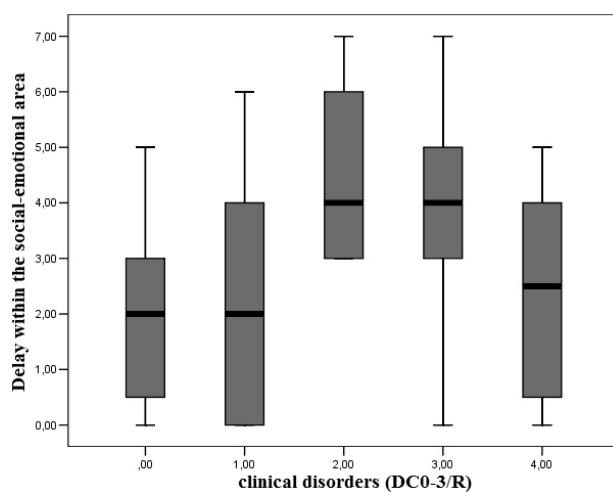
The differences found for the severity of psychomotor delay were not significant between children coming from families suffering from poverty (families with no income), as compared with children from families with acceptable economic conditions (employed parents), for any of the five developmental areas we investigated ( $p>.05$ ). Similarly, the family cultural level was not relevant for the differences in severity of the psychomotor delay, the children coming from families with low cultural level (no/ minimum schooling, illiteracy etc.) did not present significantly higher delay within the five developmental areas under investigation ( $p>.05$ ), as compared with children coming from families with medium cultural level (literate parents, with minimum schooling). The family living conditions was not a relevant factor for the severity of psychomotor delay within the five areas ( $p>.05$ ), the differences between children from families with inadequate housing and those from families with appropriate housing were not significant for any of the five developmental areas.

As for the mental health screening, our results show that the psychomotor delay increases as the child's mental health screening score increases. The higher the child's risk for mental health problems, the higher his/ her delay in gross motor ( $H=15.03$ ,  $p<.01$ ), fine motor ( $H=12.81$ ,  $p<.05$ ), cognitive ( $H=18.17$ ,  $p<.01$ ), language ( $H=13.12$ ,  $p<.05$ ) and especially socio-emotional ( $H=28.78$ ,  $p<.001$ ) areas was. The differences were particularly high between the children with 0 to 3 points and those with 4 points to the test. Although all areas of the psychomotor development investigated were affected, the highest differences were found for the social-emotional and cognitive areas.

Most of the study participants presented, of the *clinical disorders* described on axis I of the DC 0-3/R, Deprivation/ matltreatment disorder (47.1%), of which type 1: emotionally withdrawn/ inhibited pattern (26.5%), type 2: indiscriminate/ disinhibited

pattern (17.6%) and type 3: mixed (2.9%). Another clinical disorder detected was Sensory processing regulation disorder (23.5% of the total sample), with two of its subtypes: undersensitive/ underresponsive (14.7% of the participants) and hypersensitive, type A: fearful/ cautious (8.8%). A percentage of 7.4% of the participants presented Multisystem developmental disorder, a percentage of 2.9% Prolonged bereavement/ grief reaction and a percentage of 1.5% Infantile anorexia. A number of 12 participants, representing 17.6% of the total sample, did not fulfil the criteria for any of the clinical disorders described in the manual. Thus, the DC 0-3/R represents a useful instrument for the assessment of infant/ toddler mental health, as it operationalizes an important number of clinical disorders of infancy and early childhood that are not described in the DSM-IV-R (APA, 2000).

Due to small number of participants, the association between clinical disorders, as specified on axis I of the DC 0-3/R, and the psychomotor delay was not possible. The differences found between categories of disorders and the severity of psychomotor delay were not significant for gross motor ( $H=3.41$ ,  $p>.05$ ), fine motor ( $H=2.18$ ,  $p>.05$ ), cognitive ( $H=4.10$ ,  $p>.05$ ) and language ( $H=.576$ ,  $p>.05$ ) areas and significant in the case of the delay within social-emotional area ( $H=12.04$ ,  $p<.05$ ). As shown in figure 1, the delay in social-emotional development for children with regulation disorder of sensory processing, hypersensitive type, as well as for children with deprivation/ maltreatment disorder, inhibited type, is significantly higher than the delay in the case of children with regulation disorder of sensory processing, hyposensitive type, in the case of children with deprivation/ maltreatment, disinhibited type and especially compared with children that do not fulfill the criteria for any clinical disorders described in the DC 0-3/R.



**Fig. 1.** Comparison between the severity of social-emotional delay (in months), among the most frequent clinical disorders encountered

- 0 – no disorder;
- 1 – regulation disorder of sensory processing, hyposensitive type;
- 2 – regulation disorder of sensory processing, hypersensitive type (fearful/ cautious);
- 3 – deprivation/ maltreatment disorder (type 1, inhibited);
- 4 – deprivation/ maltreatment disorder (type 2, disinhibited)

In the case of the association between psychomotor delay and multisystem developmental disorder, prolonged bereavement/ grief reaction, infantile anorexia and deprivation/ maltreatment disorder, combined pattern, we could not derive any general conclusions, due to small sample size. Due to the severity of these conditions, the delay assessed was, not surprisingly, very important (between 11.2 and 13 months in the case of multisystem developmental disorder). Further investigations are needed in the case of these children, in order to detect the impact of the clinical disorders on the child's general development.

The assessment of parent-infant relationship was strongly associated with the severity of psychomotor delay of the child for all the developmental areas we assessed: gross motor ( $r=-.36$ ,  $p<.01$ ), fine motor ( $r=-.33$ ,  $p<.01$ ), cognitive ( $r=-.39$ ,  $p<.01$ ), language ( $r=-.38$ ,  $p<.01$ ) and socio-emotional ( $r=-.47$ ,  $p<.01$ ). The more problematic the relationship with the parent, the more severe the child's psychomotor delay was. The intensity of the correlations is a support for the idea that the relationship between the pairs of variables may be mediated.

The severity of psychomotor delay tends to decrease as the parent-infant relationship approaches the adequate functioning, the differences within the severity of delay among children that had difficulties in the relationship with the primary caregiver and children that had adequate relationships with the primary caregiver are small. Our results are consistent with data from the literature (Zero to Three, 2005), stating that in the case of relationship difficulties, the parent-infant relationship maintains a certain adaptive flexibility, both parent and infant's developmental progress may be unaffected, the difficulty does not generate any symptoms, despite the discomfort and stress it entails.

The severity of problems within social and emotional functioning (assessed globally, on axis V from the DC 0-3R, depending on the child's age) was positively, moderately correlated with the gross motor ( $r=.38$ ,  $p<.01$ ), fine motor ( $r=.35$ ,  $p<.01$ ), cognitive ( $r=.38$ ,  $p<.01$ ), language ( $r=.33$ ,  $p<.01$ ) and socio-emotional ( $r=.46$ ,  $p<.01$ ) delay, in high consensus with data from the literature. Our results confirm that the more affected the infant/ toddler's social and emotional functioning, the more severe the delay within the five areas assessed tends to be. Thus, the psychomotor delay appears to be significantly associated both with the social and emotional functioning and with the relational difficulties. The moderate correlation supports the possibility of a totally or partially mediated relationship.

Thus, the severity of psychomotor delay was not significantly associated with the precarity of living conditions, low family economic and cultural conditions and was significantly associated with infant/ toddler mental health, functioning of the relationship with the caregiver, social and emotional functioning. As such, we consider that relational and emotional factors are most prevalent for development in early childhood, as compared with ecological, socio-cultural factors.

The severity of malnutrition was not associated with the presence or absence of a clinical diagnosis, as specified in the DSM-IV-TR and DC 0-3/R ( $p>.05$ ), the presence of a clinical disorder is related to other factors, independent of the severity of malnutrition. Similarly, the characteristics of the caregiving environment before admittance to hospital were not associated with the presence or absence of a clinical disorder ( $p>.05$ ).

For the functioning of the relationship with the primary caregiver, most of the children of our sample (51.5%) had scores specific to a disordered relationship (less than 40 points at the PIR-GAS), followed by the children that presented features of a disordered relationship (30.9% of the total), exposed to transient risk factors and the children with adequate relationships with their caregivers, prior to admission to the hospital (17.6% of the total sample).

No significant differences were found within the relationship functioning, depending on the child's gender ( $p>.05$ ), severity of malnutrition, while in the case of environmental factors, our results show no significant association between family economic and housing conditions ( $p>.05$ ) and the relationship assessment and significant association with the family cultural level ( $V=.40$ ,  $p<.01$ ). An adequate relationship between parent and infant tends to be more frequent in families with a medium/ high cultural level and difficult to disordered relationship tend to be specific to families with low cultural level. Our results hold great clinical and therapeutic implications, but due to small sample size we recommend caution in generalization.

The qualitative association between the nature of relational difficulties and psychosocial stressors to which the children were exposed (quantified on axis IV of the DC 0-3/R) revealed that severely disordered relationships were associated with stressors such as: child abandonment, risk of child abandonment due to high number of children in the family, due to parental cognitive impairment, due to single motherhood, child institutionalization (either as a consequence of abandonment by the parent, or due to child withdrawal from the family by the child protection services), parental intellectual impairment, single illiterate mother, child neglect due to high number of children in the family or maternal immaturity (teenager mother), domestic violence. Maternal mental illness was associated with severely disordered relationships with the child if the illness was severe (ex., schizophrenia) and with features of a disordered relationship if the illness was less severe (ex., maternal anxiety). Other stressors associated with features of a disordered relationship were: single motherhood

(mature mother, over 18 years old), frequent hospitalizations of the child and high number of members in the family. Adequate parent – infant relationship was assessed in the case of dyads exposed to stressors such as poverty and inadequate housing, in absence of other psychosocial stressors.

Regarding the nature of the clinical disorders, severe disorders within the parent – infant relationship were assessed for children that presented deprivation/ maltreatment disorder and all its subtypes (on axis I of the DC 0-3/R) and reactive attachment disorder, according to the DSM-IV-TR, with prolonged bereavement/ grief reaction and multisystem developmental disorder, according to the DC 0-3/R (corresponding to pervasive developmental disorder in DSM-IV-TR). The features of disordered relationship were found in children with regulation disorders of sensory processing and infantile anorexia, according to the DC 0-3/R (respectively, in a smaller number of cases, with reactive attachment disorder, disinhibited type, according to the DSM-IV-TR), while adequate relationship with the parent with the absence of clinical disorders, both according to the DC 0-3/R and the DSM-IV-TR. Our data support the ideas that the disorders of sensory processing may affect the parent – infant relationship (Zero to Three, 2005). Surprisingly, in the case of children that had an adequate relationship with the primary caregiver, no clinical disorders as described in either DC 0-3/R or DSM-IV-TR were diagnosed, despite the difficulties that the child encountered, both at the somatic level (the malnutrition and its associated problems) and at the environmental level, factors that can at any time become severe risks for infant/ toddler mental health. Given that most of the children from our sample were exposed to various degrees of psychosocial stress, we cannot infer a causal relationship between these factors and clinical disorders of the child. The association between psychosocial stressors and clinical disorders of the child needs to be further investigated, on larger samples.

The emotional and social functioning (assessed on axis V of the DC 0-3R) was not significantly different for male and female children ( $p>.05$ ) and family environment characteristics (poverty, poor housing) were also not significant factors for the differences found in the child's emotional and social functioning. The severity of malnutrition is, however, a significant factor that accounts for the differences found in the emotional and social functioning of the infants in our study ( $H=16.58$ ,  $p<.01$ ), the emotional and social functioning tends to decrease as the severity of malnutrition increases.

A high level of emotional and social functioning was associated with several of the clinical disorders identified using the DC 0-3/R: deprivation/ maltreatment disorder, disinhibited and mixed types, while a low emotional and social functioning was predominantly associated with: regulation disorder of sensory processing, hypersensitive type (fearful/cautious), multisystem developmental disorder, deprivation/ maltreatment disorder, inhibited type, infantile anorexia, prolonged bereavement. The regulation disorder of sensory processing, hyposensitive type, was associated

both with high and low emotional and social functioning. Of the disorders described in the DSM-IV-TR, without correspondent in the DC 0-3/R, the rumination disorder was associated with adequate emotional and social functioning, while the stereotypic movement disorder with low functioning.

The emotional and social functioning was significantly associated with the quality of the parent – infant relationship ( $r=-.63$ ,  $p<.001$ ), a high correlation intensity showing that the more problematic the child's emotional and social functioning, the more affected his/her relationship with the parent was and vice versa. Moreover, the functioning of the relationship with the primary caregiver holds a significant causal effect on the child's emotional and social functioning ( $\beta=-.63$ ,  $p<.001$ ), a problematic relationship with the parent leads to low emotional and social functioning of the child.

As discussed above, our results show that the child's emotional and social functioning, as well as the quality of the parent – child relationship are significantly correlated with the severity of delay within the five areas we assessed. Due to the low intensity of the correlation, we tested the possibility that this association may be mediated. We also found a significant association between the child's emotional and social functioning and the quality of the relationship with the primary caregiver.

Data for each variable was standardized (Sava, 2004), so that the differences in their measurement were eliminated. Subsequently, we tested the mediation analysis models, according to our hypothesis (relationship quality as an independent variable, psychomotor delay within four areas as a dependent variable and emotional and social functioning as a mediator variable).

**Table 1**  
**Regression coefficients of the mediation models**

Model	$\beta_2$ (mediator - dependent)	$\beta_3$ (independent - dependent)	Aroian test
1 (gross motor delay)	.27	(-.37**) -.20	1.76
2 (fine motor delay)	.26	(-.35**) -.19	1.67
3 (cognitive delay)	.24	(-.40**) -.25	1.64
4 (language delay)	.18	(-.39**) -.28	1.17

Note: \*\* $p<.01$

The four mediation analysis models were not valid, revealing a direct causal association between the parent – infant relational quality and child gross motor, fine motor, cognitive and language development, without the mediation of the child's emotional and social functioning. Thus, the relational disorders cause delay within the four above mentioned developmental areas as early as the first months of life (due to the maternal understimulation of child development, the child's diminished curiosity for the exploration of the environment, as the adult does not represent a secure base for exploration).

Interestingly, the child's emotional and social functioning was not a significant cause of delay within the four developmental areas, revealing the prevalent role of the relationship with the caregiver over child characteristics on psychomotor development at this age. The task of finding other possible mediators of the causal association between the quality of the relationship with the caregiver and child developmental delay remains a subject for future research.

### **Conclusions and implications**

Although subjected to methodological difficulties, research in the field of early childhood mental health, in association with child development and risk factors contributing to development at this age detains high practical and clinical relevance, given the multiple implications for subsequent development of the child. We recommend caution in the generalization of our results and further research on larger samples for their confirmation and enrichment. As such, the small sample size is one of the main limitations of our study, along with other limitations specific to cross-sectional design and observational design.

Our results confirmed that in the case of children exposed to medical and psychosocial risk, the psychomotor development is strongly associated with the quality of the parent – child relationship and no significant associations were found with factors of the caregiving, family environment, such as poverty, cultural level of the family and housing conditions. We recommend the comparison of children from highly atypical environments, such as those included in our study, with children from regular family environments, much less well represented in our present study. Despite the study limitations, we confirmed the high importance that needs to be given to social, emotional and relational factors by specialists working in early intervention with children with developmental delay. Also, mental health in infancy and early childhood needs to be considered when approaching the developmental needs of these children. Evaluation and treatment planning for infants and toddlers at risk should consider both the assessment and the intervention within the family, besides considering the mental health challenges and developmental disorders, as both relationship quality and family environmental stress contribute to child development and emotional well being, as confirmed by our results.

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## **IMPROVING COMMUNICATION DEVELOPMENT AND LANGUAGE EDUCATION TOOLS IN THE CASE OF YOUNG LEARNERS**

**MARIA CLAUDIA CUC\***

**ABSTRACT.** Language and communication are psychological mechanisms at hand and subject of personal conduct adjustment and of the conduct of others. If the system images, concepts and ideas, formed through operational mechanisms of information were not to be used, then they would have no practical use, they would not be able to influence and inter-influence, but at the same time they should not be retrieved and returned to the circuit knowledge and should not have any impact on human activity. Communication, understood as an act of transactional action inevitably becomes essential to life, to the personal and social life of the individual. Pedagogical approaches used to encourage communication and development, while enriching and educating students in primary school includes space, adequate time and a set of tools meant to drive innovation and uniqueness through their involvement in the educational activity, in the well grounded educational institution. This requires the targeting of teaching based on psychological knowledge of the capabilities, skills and educational interests of students for effective action.

**Keywords:** *communication skills, language, young learner, education*

**ABSTRAKT.** Die Sprache und die Kommunikation sind die psychologischen Mechanismen die dem Subjekt zur Verfügung stehen um seinem eigenen Verhalten zu regulieren, und das Verhalten der anderen. Wenn das System der Bilder, der Konzepte und der Ideen, der mit Hilfe von Information-operativen Mechanismen gebildet würde nicht verwendet und verbreitet wäre, dann würde es keine praktische Verwendung geben, es würde nicht in der Lage sein zu beeinflussen, aber gleichzeitig konnte man das System nicht abrufen um in den Wissenskreislauf wieder gelegt zu werden und es würde keine Auswirkungen auf die menschliche Aktivität haben. Kommunikation, als ein transaktionales Akt, wird zwangsläufig notwendig grundlegend für das Leben, als auch für das persönliche und soziale Leben des Einzelnen. Psycho pädagogische Ansätze, zur Förderung und Entwicklung der Kommunikation und gleichzeitig die Bereicherung und Ausbildung der Sprache der Schüler umfasst Raum, ausreichend Zeit und eine Reihe von Werkzeugen für Innovation und Einzigartigkeit stimulieren durch ihre Einbindung in pädagogische Aktivitäten auf die etablierten Bildungsträger. Diesbezüglich erfordert Ausrichtung der Lehre auf psychologische

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Kenntnisse über die Fähigkeiten, Fertigkeiten, pädagogische Interessen der Studierenden für eine wirksame Maßnahmen ergriffen werden.

**Stichwörter:** *Kommunikationsfähigkeit, Sprache, kleine Schulen, Bildung, Grundbildung*

## 1. General Delimitations

The everyday experience that Romania has been through in the last twenty years, and more recently the economic crisis, the cultural one and the incoherent government policy crisis have lead to the delineation of a new social phenomenon – the lack of interpersonal and why not intrapersonal communication. Paradoxically, the cultural universe of our society begins to revolve around communication and speech. 'Our century is dominated by the immense power of discourse, power in which we can rediscover the great virtues of language as well as its vices (Salavastru, C., 1996, p. 7). Within the educational approach communication has a special significance and so the study area and thus its analysis is extended to all the general sections of the communication process, including the research aspect of semiotics that come to shape the overall image of scientific communication. Pedagogists, psychologists, sociologists through many reports and studies have shown that at the pragmatic level there is a lack of skills in what concerns the meditation on tools, techniques and strategies used in mass communication, which also manifests at the intellectual level. The physical and the verbal violence as well as the aggressive behavior that seems to become more and more noticeable in the Romanian society, has led the individuals towards neglecting the language that is used placing authentic communication beyond language, overburdening the intuitive communication which is an expression of the irreducible character of individual subjectivity. Within the social economy that has been built in the last few years, there are also individuals who consider the word as the creator of a universal reality, not just an instrument of its domination. However, the socio-economic situation of Romania finds its echo in the education and in the instruction of young learners. Both school and family feel the impact of the financial crisis; it can be noticed an increasingly strong individual commitment in destructive collective actions, the emergence of this so-called "subculture of despair", and why not, the immorality of the society in which the aggressive behavior at the language level becomes noticeable from childhood. The maladjustment forms that increasingly affect the young learner and the cause triggering repertory are identified and mentioned as a following effect of the analysis of these problematic cases identified by school counselors. In this context, solving these problems highlights the existence of 'fundamental orientations, which come from the imperatives of the socio-cultural form of life that are strongly related to work and language (Habermans, J., 1983). Language should not be considered only

as vocabulary but also by taking into account the meaning that we ascribe to words and the specific norms in the organization of speech. This way we shall perceive school as an institution in the case of which there is an increasing wish to communicate by all means, in which learning and communication are made at all of the levels, and for any possible socio-cultural or thematic context. The goal of communication in Romanian schools is human achievement, in all of the individual's fundamental moments of existence and in all possible conditions. The development of verbal creativity in learners -as the final objective of the instructive educational process - has a chance of fulfillment by adopting creative learning from the first year of school. If the specific creative learning activities are considered together, both at the methodological level and in the branches of the Romanian language discipline according to the new functional communicative model, then students' creativity will be specifically stimulated, having a much greater opportunity of expression.

The language used indicates a certain level of understanding and knowledge of ideas and feelings. To speak and write means to create the introspection of the inner and of the outer world, to communicate with others through language that is used as a tool of thought. Profound thinking imposes a rich vocabulary and the soul nuances require language nuances. The main objective of the study of Romanian language and literature in primary school, according to the primary school curriculum is the development of learners' oral and written communication skills, becoming familiar with literary and non-literary texts that are significant for young learners between the age of 6/7 to 10/11 specific to the usage of the language in concrete communication contexts. The new model of Romanian language teaching and learning in primary school - the functional communicative model requires for creative learning as a specific functional didactic strategy to be adapted to the psychological conditions of this school age, to the specific context of intra-inter-trans-disciplinary relations. The Romanian language discipline plays the main role in the general process of learner training, representing the main means of communication and information, and through all of its levels it contributes to the development of thinking and to the spiritual modeling of learners offering them the necessary support for their intellectual evolution and the possibility of integration in social life.

## **2. The psychological and language peculiarities in the case of young learners**

Through language, the learners convey their own needs and requirements, they develop and communicate their thoughts, their joys and sorrows, and they organize their activities. Language gives the young learner autonomy and the ability to easily move within the environment. Language as a psycho-individual manner of language usage becomes the most expressive way of personality revelation, of the originality and singularity of the human subject. Between communication and the cognitive level there is a unitary connection; at a more evolved level there is no thinking without language, and speech without meaning or cognitive content is a simply form without content.

Playing within the human psychic a critical role, language is somehow an axle within the human psychological system that makes the phenomenon of consciousness possible. Language determines the form of communication. It is in fact the communication code that connects the person who transmits information- the transmitter and the person who receives it- the receiver. Given the importance of language in life, the teacher should always capitalize any possible student verbal expression in the case of all of the activities that are performed in school. In kindergarten the learners' educational needs have been fulfilled, the learner masters to some extent the language system but his/her skills are not yet solid, thus at the language level there are subjects in the case of which language deviations can be noticed, deviations that are determined by the cultural environment in which they have developed and who are also influenced by the specific language deviations in the area they live. There can be identified a discrepancy between the active and the passive vocabulary as well as the oscillations occurring during the creation of words. The child's verbal experience in his/her first six years of life influences his/her entire psychological development. When starting school the child has a certain intellectual and verbal experience. The child can understand people around him speaking and he/she is capable of making him/herself understood by expressing thoughts in correct sentences and phrases. The learner is aware of the differences between various objects and phenomena; he/she is capable of understanding irony and of getting involved in contradictory discussions and their wishes and preferences are expressed much clearly. This verbal expression is facilitated by the relatively large vocabulary capacity of about 3500 words, 700- 800 of which are part of the active vocabulary. The shift is made from the specific preschool situational language to the contextual language, the language that develops coherently and that is well structured. The pronunciation defects that are often encountered in the case of young learners are: the replacement of j with z, the replacement of sounds that are more difficult to pronounce such as L and R, the exclusion of certain sounds, the misuse of the genre and of the article. It is in primary school that the basic intellectual skills are formed: reading, writing and the math skills. The social status of the child is continuously changing, the child becomes a student who has obligations and at the same time rights; the relationships that had been previously established with the family and with other children change as well and are structured through other principles that are considered at this stage. The young learner gradually becomes more secure, he/she pays attention to his/her gestures and is capable of focusing on things much better now; within the instructive educational process voluntary attention is created , the stability and the distribution of attention is increased so that the learner can now take part in learning activities for longer periods of time. The child becomes more attentive to himself, he /she is more aware of his/her own inner self and at this stage things cannot be easily modified. In this context, the process of internal language formation enhances the young learner's capacity of planning his/her activities mentally and of always adjusting them. By talking to him/herself, the child finds solutions and orders his/her own actions. Language is of great importance for the child's intellectual development,

because inner language is the underlying mechanism of thought. During this period of time, the phonetic side of language constantly develops, although the pronunciation of words is not entirely correct due to peculiarities of the vocal tract, of the verbal-motor analyzer and of the hearing analyzer. Children learn the background lexicon as well as the significance of words, concepts. But the most important issue in the case of young learners is learning the grammatical structure of the language.

### **3. Developing communication skills in the case of young learners**

Developing communication skills at young school age is one of the major objectives that is achieved gradually, by increasing the number of verbal interactions with people surrounding the children, in the context in which the children manifest the curiosity of object knowledge, of an interrogative attitude regarding the origin and the cause of various phenomena. The evolution of language in itself implies a whole series of gradual interests: in the beginning, the child only uses nouns, indicating known objects, then, in his/her vocabulary there can be noticed the verbs, the conjunctions, the adjectives, the numerals and finally the pronouns. This sequence of occurrence is constant, independent of the age at which language and various ways of learning it develop. By developing communication skills, the child goes through certain stages of speech learning: a. the global vision period, in which there can be differentiated more or less outlined ensembles; b. the analysis stage, which gives rise to mental images; c. the schematic stage, created through the fusion of mental images and reduced to the essence of the object that forms the concept to which the word label is being given and where it remains. In the idea of developing communication skills in the case of young learners, the teacher must consider the essential characteristics of language at early school ages:

- the increase in expressiveness achieved through content and sentence structure, through epithets and comparisons;
- the transition from inner to outer language;
- the morphology and the speech synthesis development (the correction of pronunciation and of grammar accordance);
- simultaneous language development and appearance of the communication functions, of cognitive experience fixation and activity organization;

During this time, the teacher must continuously stimulate communication between children, take into account their need of spontaneous communication, of cultivating this tendency, intervening in the process of style correction and for the clarification of the ideas expressed by the learners. In order to enhance the quality of language and vocabulary the interest is not so much on the number of new words learned from any layer of the language, but rather on the number of words of higher frequency in everyday speech and first of all on words from the main language lexicon. The teacher can use didactic methods for creating oral communication content: conversation, story telling, role play, exercise, problem-solving, explanatory reading,

exposition, the phonetic, analytical-synthetic method and so on. The teaching methods gain their own value through the efficiency of the activity in which they are engaged, through the way in which they are implemented by the teacher in the instructive educational process.

### **The Experimental Part**

The education and the development of communication in the case of young learners must be consistent with current needs and social demands and also with defining requirements of formative education favored by the Romanian educational system. According to theoretical assumptions, an ameliorative psycho-didactic intervention that aims at identifying and giving value to certain means of perfecting the educational practice first in the case of the Romanian language discipline and then, as an extension of its effect in the case of all of the subjects provided in the curriculum and which are mandatory, optional or facultative for pupils in elementary school to follow is necessary. The main object of the research was the analysis of the issue of development of communication skills of young learners, of the methods and strategies used during the instructive educational process. The inclusion of all the responsible factors: teachers, counselors, psychologists and of other educational partners: the family and the cultural institutions represent an important aspect. In the case of the intervention that was made the starting point was the assumption that if in the case of the teaching and learning activities higher attention is paid to their organization as such or as situational games based on communication, by using interactive group techniques and strategies adequate for the learners and which are consistent with everyone's own work pace, evaluated by scientific criteria, the formation and the development of a real efficient communication competence and language education premises that target the diminishment of difficulties in communication and at the same time the development and the enrichment of vocabulary as a necessary condition for the increase in school performance in the case of primary school students will be created.

#### **Research variables:**

- the independent variable – revaluation of educational techniques by using adequate interactive group techniques and strategies and by taking into account every learner's own work pace, evaluated by scientific criteria
- the dependent variable, objectified in effects, expectations, achievement targets, the diminishment of communication difficulties and at the same time the development and enrichment of vocabulary, as a necessary condition for the increase value of school performances

The specific objectives that were considered are:

- the creation and the development of communication and language education abilities for the instructive-educational activities that are organized and directed as a state of communication.

- the shaping of a more accurate picture of the actual situation in the case of the Romanian Language discipline as the result of an initial evaluation
- the determination of the degree of development of verbal, nonverbal and Para-verbal learner communication skills
  - the identification of the level of poor communication and the elaboration of an ameliorative intervention program, in collaboration with teaching practitioners, methodologists, parents as important educational factors in the shaping and the influencing of a communication style, of an adequate language norm, on the basis of certain formative-educational activities, at the experimental stage
  - the students' practice of techniques and processes of enrichment and education of language
    - recording, monitoring and comparing the results obtained from initial, formative and final assessment
    - the design and the development of the language education activities by using interactive group strategies, applied in different forms of activities, either individually or in groups
    - the development of students' vocabulary and of their communication skills as the result of constant use of interactive strategies

The research methods and tools that were used have had as main purpose the collection of data, whose analysis should verify the hypothesis, but at the same time provide answers on the research topic. Methods such as the interview, the questionnaire, the observation, the teaching experiment, in all the stages that were psycho-didactically investigated were used as well as the application of different communication methods (story telling, explanation, heuristic conversation, dialogue discussion, questioning, reading), and of different work techniques, which enabled the analysis of the advantages and disadvantages of the applications of such methods so as to underline their efficiency in stimulating learners' communication through language, respectively writing at early age, during the first year of school.

The pedagogical intervention has been conducted for over four months on two parallel classes, consisting of 54 students, 29 of which were girls and the rest of 25 of which were boys from the First Grade. They were six or seven years old. The qualitative sizing of the sample of subjects was based on the use of class samples: the control sample and the experimental sample that were created by considering the age criteria. The advantage in the case of this type of sampling is represented by the natural environment in which the investigation could take place, by the natural organization of the educational process.

The pre-experimental phase lasted 3 weeks. The subjects were given a wide range of tests meant to determine their level of development of verbal, nonverbal and Para verbal skills. In parallel, a 10 item- questionnaire was given, with the main purpose of identifying the familial communicational, affective and educational climate of the subjects.

After analyzing the results obtained in the case of the given questionnaire, the following results could be noticed:

Percentual Distribution:

- 98% is the percentage of children who know their full names and surnames as well as those of their parents
- 55% is the percentage of subjects who have an intrinsic motivation for learning and getting good grades; 25% of them have an intrinsic motivation for obtaining very good grades, and 30% of them are extrinsically motivated
- 20% of the subjects are helped by their grandparents in doing their homework, 20% of them are helped by their mothers 5% of them are helped by their fathers, and 55% of the subjects are supervised while doing their homework and this way they do their own homework.
- 66% of the subjects give their family members information about their educational activity at school and 34% of them do not offer their families any kind of information about their school results
- 45% of the parents are interested in what the subjects are reading, 64% of the parents do not monitor students' reading, nor provide other suggestions.

**Pedagogical intervention**

During the experimental phase, which lasted three months, there have been given evaluation samples and formative tests of applied knowledge for the experimental sample with the purpose of checking the degree of assimilation and understanding of knowledge and acquisition, of establishing the values of the dependent variables and for adopting certain ameliorative measures. During language and communication classes there have been used various work techniques applied on different forms of activity (story telling, the didactic game, reading, visual literacy, conversation, memorization) in order to become aware of the effectiveness of each working method with the purpose of achieving the objectives of developing oral/written message reception and expressions abilities. The following indicators were important: the signaling methods, the prompt, immediate correction of mistakes, the way in which they were explained with the learners' help or through the intervention of the teacher as well as the way in which such explanations were received, the learner's degree of implication in working either in groups or in the case of differentiated, individualized tasks, the learners' degree of involvement in discovering what was new to discover, new information, the relationship between quantity and quality in the case of the teaching materials used as support, new information, the rapport between the quantity and the quality of certain teaching materials, the objective notice of the typology and symptomatology of the difficulties encountered in enriching the vocabulary and in handling communication according to the interpretation grid, the changes in students' behavior as well as in teachers' behavior, according to the independent variables, the rhythm and the increase in amplification of school performance, the

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diminishment of communication and language education difficulties, the identification of the encountered obstacles- the way in which they could be solved by the students, the teacher, the diversity of the formative activities within the psycho-pedagogical experiment.

Effective intervention proposals meant to aid the learners in creating a more viable system of enrichment and education of the language, of communication in verbal coordinates (oral and written) and non-verbal ones and in developing a new perspective were made after the research.

- the development of parental educational involvement skills
- appropriate and effective communication, by developing confidence in students' opportunities and abilities to relate to other people and assume responsibilities
- School has an educational and socializing role; its intervention in stimulating activities, in enhancing the communication, intellectual, emotional and creative potential of the child for the induction of positive states is necessary
- Tutoring and counseling activities, leading to reduction in the number of errors commonly encountered in speech, making a didactic class project that should have as primary objective the increase in efficiency of the communication skill development tools
- Groups of social and personal development by encouraging creativity in the group, the spirit of competition and by supporting the students' free and spontaneous manifestation
- cultural-educational activities meant to reduce the time spent by students on harmful educational actions, encouraging interactive participation and an active spirit
- Availability of day care centers and of special programs for children from families of lower socio-cultural level, whose parents do not have the necessary financial potential to support some costs for educational programs that might lead to developing communication and language education skills

By analyzing the personalized intervention on the sample group it was noticed that 78% of the students have improved their communication skills and at the same time have enriched their vocabulary and that the feeling and social educational retreat was gone. This intervention has outlined another aspect, namely the reduction reduced by more than 28% in what concerns the potential of the subjects, the improvement of the parents' social skills, of interaction and communication with the students.

Thus we believe that we want the concretization of the effective intervention through various instruments, means of involvement in the achievement of the educational communication objectives, through interculturalism and through efficient educational management, by educating the communication behavior, school cultivates and strengthens the role of the interlocutor, of the student's partner (co-responsible and co-interested) in its own making and allows students to gradually build a positive self image in a favorable and appropriate climate for their own expression and for the reunited interpersonal communication.

### **Conclusions:**

Human communication is defined and understood as the interpersonal relationship in which the man gives meaning and value to the message that has been received or sent. This way, communication represents all the forms of manifestation of the individual in relation to himself, or another individual or to the environment. The improvement in communication requires a lot: exercises and the mastery of methods, techniques and strategies. At the same time, communication learning implies profound motivation and personal effort. The teacher simulating life situations helps the student to practice various roles, it outlines his self-esteem and the esteem for his partner, and it endows him with a set of norms of moral conduct. The game stimulates the formation and the development of the concept of communication, the establishment of a positive educational climate, active, empathetic listening. Armed with classical and modern strategies, the competent teacher will ensure proper use of the Romanian language in receiving and producing messages in various communication situations. Cooperative learning strategies provide students the opportunity to materialize their need to work together, to communicate and share ideas in a collegial atmosphere of encouragement and mutual support. The group enables the assessment of ideas, the revision of opinions and the development of interpersonal intelligence. Teamwork has significant effects on the students' personality, the presence of the partners in interaction representing an intellectual and triggering of information exchange in communication. This construction involves teamwork, a detached view of the development of perfection, of the change in attitudes and it leads to the increase in dynamics of the communicational universe.

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## THE EFFECTS OF WORKING MEMORY TRAINING VS. METACOGNITIVE TRAINING ON MATH PERFORMANCE OF LOW ACHIEVING STUDENTS

CARMEN DAVID\*, ANCA MAIER\*

**ABSTRACT.** In the current study we investigated the efficiency of two different types of training on the mathematical performance of students with low achievement in Mathematics. We chose to select a direct training of domain-specific working memory and a training of metacognitive skills as applied to Mathematics. It seems that domain-specific working memory deficits are encountered in children with Math learning difficulties. Moreover, it seems also reasonable to consider a program that is based on metacognition, as many mathematical activities are approached in a systematic and algorithmic manner. Both programs were efficient in enhancing operation fluency in simple and complex math problems. Results can be used in the direction of adding to the behavioral profile of children with Math learning disabilities, but also in designing efficient intervention programs for poor Mathematicians.

**Key words:** *math low achievers, domain-specific working memory, metacognition, training, prediction strategy, evaluation strategy.*

**ZUSAMMENFASSUNG.** In der vorliegenden Studie habe ich die Wirksamkeit zweier Trainigmethoden bezüglich der mathematischen Leistungen von Schülern mit schlechten Ergebnissen im Fach Mathematik untersucht. Ich habe ein direktes Trainingprogramm für das spezifische numerische Arbeitsgedächtnis ausgewählt und ein Training der metakognitiven Fähigkeiten mit Anwendung im Bereich des Faches Mathematik. Auch ein Interventionsprogramm basierend auf metakognitiven Techniken ist angebracht, da viele mathematische Tätigkeiten in einer systematischen und algorithmischen Weise angegangen werden. Beide Programme waren wirksam, was die Aufbesserung der Rechnungsfähigkeit bei einfachen Rechenübungen angeht, aber auch bei Operationen mit hohen Zahlenwerten. Die Ergebnisse können verwendet werden, sowohl als Ergänzung des kognitiven Profils der Kinder mit Lernprobleme im Bereich der Mathematik, als auch für das Planen von effektiven Interventionsprogrammen für Schüler mit schlechten Ergebnissen im Fach Mathematik.

**Schlüsselbegriffe:** *Schüler mit schlechten Ergebnissen im Fach Mathematik, spezifisches numerisches Arbeitsgedächtnis, Metakognition, Training, Voraussagestrategie, Bewertungsstrategie.*

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## 1. Introduction

Learning mathematics is becoming imperious in modern societies. Even though, the tendency in Romania is towards simplifying the Math curricula and to expend the content over several school years, the societal expectancies, reflected in curricular objectives and selected Math content, increased. In this context, Math learning problems that appear in the formal learning are obvious, and the interest in designing and investigating efficiency of remedial interventions continues to increase. Even so, the number of studies that investigate the efficiency of this kind of interventions for improving Math performance is low as compared with the number of studies on other topics in the literature on Mathematical education and cognition. Scientifically validated interventions are only at the beginning, and treatment protocols on the current cognitive theories (Geary, 2010) are to be developed. Meanwhile, such a low number of studies on this topic can be explained by high costs and implementation difficulties (Wilson & Räsänen, 2008). Interventions for students with Math learning difficulties can also be categorized based on the psychological approach in constructivist interventions (in which the student builds math knowledge step by step), behaviorist interventions (model the algorithm and practice the procedure until it becomes automatic) cognitive interventions (students achieve learning strategies and also metacognitive strategies, to use when solving math problems), interventions that develop internal representations of math concepts, interventions based on situated learning (Wilson & Räsänen, 2008). A different direction in intervention goes towards improving working memory abilities of students with math learning difficulties, based on cognitive theories of working memory deficits as responsible for poor Math performance (Geary, 1993; 2004). In a comprehensive synthesis, Geary (2010) mentions such studies that address the efficiency of working memory interventions in stimulating attention control (Holmes, Gathercole and Dunning, 2009), and inhibitory control (Diamond et al., 2007; Thorell et al., 2009). Results on stability in time and generalization of trained skills are mixt (Geary, 2010).

Our objective is to investigate the efficiency of two types of interventions built on different theoretical models, over fluency and accuracy in solving arithmetic problems. These programs are considered cognitive interventions, not explicit interventions.

Without a doubt working memory plays an important role in school achievement (Gathercole and Pickering, 2001). However, it is not clear how to interpret the relation between low math abilities and the performance profile in working memory tasks of Math learning disabled. Some researchers sustain that learning disabled students have a working memory deficit (Geary, 1993, 2004) that will result in difficulties in making associations between the arithmetic operation and the result as a rapid decay of the memory trace occurs. Others sustain the idea of selective working memory deficits such as domain specific deficits of numerical nature (Sigel and Ryan, 1989) or selective deficits in working memory components, such as the central executive component. Hitch and McAuley (1991) obtained important

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differences between the Math learning disabled students and the average achieving in working memory tasks that involved counting but not comparison. Also, on working memory span, counting on concrete materials and verbal counting, those children had poorer performances than the typical achievers. Siegel and Ryan (1989) compared the Math learning disabled students with a control group on two working memory tasks: listening span and counting span. 9-10 years old and 11-13 years old students with math learning disabilities (MLD) had a lower counting span, but not listening span which led them to hypothesize a deficit in a domain specific working memory that is involved in arithmetical tasks. Also, Passolunghi and Siegel (2004) found important differences between MLD and the control group in counting span tasks. These findings come in support of the idea of a working memory deficit in numerical domain. However, a similar performance could be explained by means of low attention control as a result of higher demands raised by numerical tasks in which children with MLD perform poorly. (Raghubar, 2010). Our hypothesis is that, if the MLD students show a lower attention control because of numerical material and / or numerical processing, than training this function in specific mathematical situations will improve Math performance in arithmetical problems, especially in additions and subtractions (not so often in multiplications), where arithmetical facts are not automatic and therefore an active manipulation with numerical material is needed, together with a temporary storage of partial results and intermediate steps.

Metacognition influences the use and hold of cognitive strategies in learning, and also in learning Mathematics. Most of the studies underline two major components of metacognition: metacognitive knowledge and metacognitive strategies. The most efficient approaches in developing metacognition involve the developing of knowledge about cognitive strategies and processes, and offering opportunities for practicing cognitive strategies and metacognitive ones. Neither seems to be efficient when applied separately. Rourke (1993), Geary (2004), Montague (1992) indicated metacognition as an important area for students with learning disabilities. The low metacognitive ability students don't have knowledge about their own cognitive processes, their products or anything that connects with them (Flavell, 1976, apud Garrett, Mazzocco, Baker, 2006); they can't judge what kind of problem they are able to solve. They experience failure in planning the operations they need to make to solve the math tasks, show difficulties in monitoring of procedures they use, most of the time they fail in identifying the errors they make (Lucangeli, Cornoldi & Tellarini, 1997, apud Garrett, Mazzocco, Baker, 2006). Prediction abilities allow them to distinguish between the simple problems and the difficult ones, to identify those that need more time, more effort, and more skills to be solved. The students with better prediction abilities are capable to distinguish between real difficulties and apparent ones, when they predict the performance they will have. The evaluation abilities help them reflect on the solutions and to identify the possible errors they made. If they have low evaluation abilities, their monitoring abilities

will be low, too. They won't be able to judge if the solving plan is the right one or if the solution is right (Garrett, Mazzocco, Baker, 2006). Several studies found positive effects of metacognitive training on Math performance (Pennequin et al., 2010; Ozsoy and Ataman, 2009; Gillies et al., 1995). However most of them investigate the effects of such training on performance in word problems and not in arithmetical problems. So, knowing that metacognition supports learning, we can assume that it is equally important in arithmetical problems that also involves planning, steps monitoring, estimation of task difficulty. A metacognitive training will increase Math performance by developing metacognitive knowledge and strategies necessary in performing complex algorithms. No effect is hypothesized for simple single digit calculation.

## 2. Method

### *Participants*

Participants were third graders from a school in Cluj-Napoca. Of the four third grades in the school, three had a teaching program in Romanian language and one in Hungarian. Since the training programs were in Romanian, we selected only the grades with native speakers of Romanian language. Those were administered the pre-test assessment, after obtaining parent consent in proportion of 94% of the cases. All students are enrolled in regular programs; none had a clinical diagnostic. Pretest was administered to a number of 72 children of the three grades, all third graders. Based on pre-test results, participants with low scores were selected and assigned to the three groups, of which two were administered the training conditions. One was the control group. We only considered low achievers in Mathematics, based on whether their performance was at least one standard deviation under the mean of the group. Each group consisted of an equal number of students from each grade, in order to avoid any influences of the teaching style and pace of teaching. Appendix one displays descriptive statistics for the three groups for the calculation fluency task. An ANOVA between groups test was administered. No significant differences were found between groups in the pre-test condition (addition,  $F(2, 33) = 1, 34, p < .20$ ; subtraction,  $F(2, 33) = .20, p < .80$ ; multiplication,  $F(2, 33) = .70, p < .50$ ). No differences were in between groups based on scores of the other measures (see table 2).

### *Procedure*

One week before the training, participants were tested with a calculation fluency task, a working memory task, and a metacognitive instrument. One week after the training, post-test measures were administered and participants were rewarded.

### *Measures*

Calculation fluency measures consisted of a sheet with 81 single-digit arithmetical problems. Children had to solve as many as possible in 90 seconds per each sheet. One sheet contained simple single-digit additions, one single-digit subtractions, and one single-digit multiplications.

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Third grade mathematical knowledge test is an informal instrument developed together with the Resource teacher, based on third grade Math curriculum and long range plans. It contains several arithmetical problems: multiple digit additions and subtractions, multiplication by 10s, simple division and order of operations with all four operations and round parenthesis.

### Metacognitive measures

The Evaluation and Prediction Assessment (Desoete, 2001) is an instrument that allows for the assessment of mathematical knowledge and metacognitive skills of prediction and evaluation. In order to assess predictive strategies in students they are required to mark on a Likert scale (1- no, I don't know the right answer, 2- I don't know whether I am able to solve it correctly, 3- yes, I know the right answer) whether they know the right answer for each of the arithmetical problems, without solving them. Second phase consists of giving the students a page with the same arithmetical problems with the instruction to solve them. In the third phase, the evaluation instrument is given. Students need to appreciate whether they were able to solve the problems correctly (1- no, I did not give a right answer; 2- I don't know; 3- yes, I gave the correct answer). Metacognitive questionnaire assesses declarative, procedural, and strategic metacognitive knowledge, as well as prediction, planning, monitoring, and evaluation metacognitive strategies. Working memory measures: Digit span subscale from Wechsler Intelligence Scale for Children (Wechsler, 2003) was also administered to measure working memory abilities with numerical material.

### 3. Description of the training programs

*Duration:* both trainings were conducted over a 3 week period, with 2 weekly sessions of 50 minutes each. Sessions were conducted in small groups of 4-5 children to facilitate group discussions and to reduce the demands on the working memory group tasks. All sessions were conducted in school, in the Resource room, apart from their classrooms.

*The metacognitive training* was created to improve the metacognitive knowledge and metacognitive strategies of students with low performance in Math. It was designed on Dolly model. The first training session was introductory and consisted of a short presentation of the training and of the Dolly model (Glava, 2009), with its four stages: modeling stage, the practice stage with teacher's support, the cooperation stage, and the individual practice stage. In the second session we discussed the importance of metacognitive questions in each of the stages. Semantically similar questions were formulated by the group and written down on colored cards (What do we know and what do we need to find out? What is the given data?; What strategies are more appropriate to solve this arithmetical problem?; What is similar to/different from other problems solved before?; Am I able to solve it independently?; What were the difficulties that I encountered when solving the problem? ; How can I check the answer?; Is there another way to solve it?; Which one is the more efficient way to solve it?).

In the third session we discussed the first two stages: the modeling stage and the practice stage with teacher's help; their importance, the way of developing the stage, working on a specific arithmetic problem. The fourth session we discussed the other two stages: the cooperation stage and the individual practice stage. During the fifth session, students in this training condition practiced this model on different arithmetic problems. The last meeting consisted of underlying the importance of this model and the way it could influence school performance. Several guidelines based on previous studies were considered when implementing the program (for more details, see Glava, 2009 ).

*Domain-specific working memory training*

This type of training addressed the enhancement of working memory abilities specifically in the numerical domain and it contained not only numerical material, but also numerical processing. All activities were designed in order to contain concomitantly temporary storage of numerical information and processing, according to current definitions of working memory (Engle et al., 1999). All training sessions were presented as games for motivational purpose. In the first session, children played the numbers game which consisted of filling in an incomplete number chart with numbers from 0-100. Each child received only a fourth of the chart to complete. After completion, they were asked to recall the numbers they wrote. In the calculation game, they were asked to solve multi-digit vertical additions. After completion, they were asked to recall the numerical material. The calculation results were not corrected. In the second session, we used a well-known working memory task, such as counting span (Case et al., 1982) and we adapted it to be applicable simultaneously to groups of 4 children. Children were given cards with dots. Dots were green and yellow on blue background and were randomly distributed on the card. Dots were the same size. The set size varied from 6 yellow dots to 14. The task consisted of counting the yellow dots and recalling in order of presentation all the counted amounts on four cards. The processing task was to decide who among them had the card with greatest number of dots and in each counting trial. The child with the greatest number had to raise his/her hand to signalize it.

In the "One meter of numbers" game, children were given numbers from zero to nine written in words on a single row on a long paper strip (seven to eight number words). They had to read them silently, memorize them and make the sum of the last two. When recalling the numbers, a piece from the strip was cut containing the numbers recalled correctly. At the end, all the pieces were put together and measured to see if the group has managed to add up to a meter of strip.

In session three, three activities were included. In the "Where does the phone ring" game, children received small cards with phone numbers of six to seven digits with the first three digits identical and in the same order and the last four digits were randomized. Children had to memorize the digits in the given sequence and make the sum of the last two. Afterwards, the trainer "dials" a phone number and the children have to recognize the number and say "ring ring". "Sudoku numbers" game required

the children to fill in Sudoku charts with numbers from one to four. On a small card there were four Sudoku squares assigned to four children (each child had one square to fill in). The rules were explained and a trial session was run previously. Children were given few seconds to identify the missing numbers according to Sudoku rules. Each child had to name and ask for the two missing numbers on his square after the square was removed. “Geographical superlatives” game was presented as a general knowledge contest. Children had to listen to a statement with geographical superlatives and numerical information that probes them. Afterwards, they were asked a processing question referring to other information from the same statement. After answering the question children are asked to recall the number. In session four, “Chain addition” game developed after a Luria task was played. The children were sitting in a circle. A starting point (a random number) was established by the trainer. The first child had to add six to the given number. The second had to add six to the sum obtained by the first one and so on. When given a wrong answer the child received a penalty card that stopped him for the next trial. The game continued until all children had difficulties with the addition. In session five, we played the classical game of “the Orange”. The children had to roll a pair of dice and had to remember the numbers obtained. The trainer starts the game by saying “I would like to eat (e.g. 4)\_\_\_ oranges”. The child that recognizes his number answered “Why 4 and not e.g. 6? The child to recognize the number six will do the same by choosing a different number. In “Alternative addition”, children were supposed to make a chain addition (same as the previous game described in session four), this time adding alternatively number six and number five. The same rules were applied.

#### **4. Results**

ANOVA statistical procedure was used to analyze the data obtained in pre and post intervention phases for all three groups. Results showed no difference among groups (two experimental and one control) before the training. After the training the results showed significant differences between groups on all measures except on subtraction and evaluation strategy assessment. The detailed results (F values and p) are presented in table 1.

The result sustains the rejection of the null hypothesis showing differences among groups but it doesn't allow us to say where exactly the differences are. For this reason, we run a post hoc analysis (Tukey test). Prior to this analysis a Levene test was run to assess the equality of variances in different samples. The results were not significant allowing us to assume equal variances. Based on this assumption we selected the Post Hoc Tukey test in order to compare the results between each measure. Table 3 presents the mean values of differences and p – values between all three groups.

**Table 1.**  
**ANOVA results between groups (pre and post intervention).**

	Fpretest			Fpostest		
	Fpretest		N	Fpostest		N
	(2,33)	p		(2,33)	p	
Addition	1.34	0.20	36.00	3.30	0.05	36.00
Subtraction	0.20	0.80	36.00	2.04	0.10	36.00
Multiplication	0.70	0.50	36.00	4.90	0.01	36.00
Direct recall	1.70	0.10	36.00	14.70	0.01	36.00
Backward digit span	1.40	0.24	36.00	5.30	0.01	36.00
Total score metacognition	0.33	0.70	36.00	4.00	0.02	36.00
Prediction	0.20	0.80	36.00	3.80	0.03	36.00
Solving	0.50	1.00	36.00	3.32	0.05	36.00
Evaluation	0.1	0.9	36.00	1.67	0.2	36.00

**Table 2.**  
**Post Hoc analyses between groups**

POST HOC - Tukey	WM Training		MC Training	
	MD	p	MD	P
Addition	6.8	0.05	6.33	0.05
Subtraction	-			
Multiplication	7.41	0.01	6.4	0.01
Direct recall	3.9	0.01	2.16	0.01
Backward digit span	1.91	0.01	0.25	1
Total score metacognition	1.6	0.1	2.1	0.03
Prediction	0.66	1	1.91	0.03
Solving	2.6	0.05	2.4	0.05
Evaluation	-			

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After the domain specific working memory training children's performance on working memory improved significantly as compared to the control group. Their computation fluency improved but not in the case of subtraction. Also in the case of informal calculation assessment their overall performance increased significantly. The statistical analyses showed that metacognitive training was efficient in increasing Math performance as well as in improving prediction strategy in children with low achievement. Again, no improvement was obtained in the case of subtraction. The other math measurements recorded significant improvements.

### 5. Discussion

Based on the results we can conclude that students with low mathematical achievement can benefit from a domain specific working memory training as applied to Mathematics. The gain was recorded at the level of enhancing calculation speed of addition and multiplication and also in accuracy of solving complex arithmetical problems. Not only the calculation speed improved, but also the accuracy in calculation. No improvement was obtained in the case of subtraction and this can be explained by the fact that the memory training program involved working memory skills with a load on the phonological loop and that a different mechanism is involved in performing subtraction. Moreover, these results come in support to the idea that working memory can be specifically trained in elementary children which is consistent with the previous data from the literature (Holmes et al., 2009). The activities selected for the training program were designed to have a higher ecological validity than classical working memory task. This was accomplished by modeling real life situations in which Mathematics can be applied. We can presume that this fact will also facilitate the transfer of working memory abilities to other mathematical tasks required from the student for school success. Among metacognitive strategies, predictive strategy skills were enhanced after the metacognitive program. Predictive strategies required the students to anticipate the results of the solving process and to estimate the level of difficulty of a certain arithmetical problem. After the training, children were better at estimating more accurately the difficulty of complex arithmetical problems and to self assess their own solving skills. In the case of the evaluation strategy there was no significant improvement. This can be explained by the fact the training overall addressed less this particular skill. These results should be considered with precaution since a follow up study was necessary to establish the achievements stability in time. Also, even though intensive (in frequency and duration), trainings were conducted over a relatively short period of time.

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Descriptive statistics

	WM Training				MC Training				Control			
	PRE-test		POST-test		PRE-test		POST-test		PRE-test		POST-test	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Addition	21	4.6	29.83	6.91	22.5	4.23	30.33	7.5	24.17	5.23	24	5.39
Subtraction	22.75	6.89	28.75	8.17	24.33	5.69	27.58	6.09	23.83	5.42	23.33	6.27
Multiplication	14.75	6.46	19.67	6.67	18.5	9.45	23.5	4.85	16.83	7.08	16.08	5.71
Direct recall	7.08	1.31	10.08	2.1	5.75	1.91	8.33	1.87	5.92	1.24	6.17	1.19
Backward digit span	6.17	2.2	7.58	1.88	5.5	1.67	5.92	1.67	6.92	2.15	5.67	0.92
Total score												
metacognition	6.5	2.06	6.25	1.65	5.67	2.67	6.75	2	6.17	2.75	4.58	2.1
Prediction	6.33	1.96	7	1.8	6.75	1.81	8.25	1.65	6.83	2.36	6.33	1.67
Solving	6.5	2.43	8	1.85	6.5	1.93	8.33	1.61	6.5	2.97	6.33	2.8
Evaluation	7.17	1.89	7.08	1.78	6.92	1.83	8.33	1.82	7.08	2.02	7	2.33

## TEACHER BURNOUT AND PROFESSIONAL STRESS

VASILE RADU PREDA\*

**ABSTRACT.** Professional exhaustion (“burnout”) is the result of chronic stressful conditions and of the feeling that at the work-place there is a discrepancy between personal abilities and the real working conditions. The objective of this study is a research of the level of perceived stress in case of teachers and that of dimensions professional exhaustion a) the connection between the level of perceived stress and that of emotional exhaustion; b) the connection between the level of perceived stress and that of the depersonalization at the level of interpersonal relations.

**Keywords:** *perceived stress, teacher burnout, emotional exhaustion, depersonalization of interpersonal relations, educational management.*

**KURZFASSUNG.** Das **Burn-out-Syndrom** ist das Resultat unterschiedlicher Bedingungen, die fortwährenden Stress erzeugen und das Gefühl produzieren, dass am Arbeitsplatz Diskrepanzen zwischen den persönlichen Fähigkeiten und den wahren Arbeitsbedingungen existieren. Ziel der vorliegenden Studie ist die Vorstellung einer Forschung bei Lehrern über ihr Stressniveau, verbunden mit dem a) Niveau der beruflichen Erschöpfung und b) der Beziehung des gefühlten Stresses und der Unpersonifizierung der zwischenmenschlichen Beziehungen.

**Schlüsselwörter:** *gefühlten Stress, berufliche Erschöpfung, emotionelle Erschöpfung, Unpersonifizierung der zwischenmenschlichen Beziehungen, Erziehungsmanagement.*

### 1. Burnout: definitions and features

In 1969, Loretta Bradley was the first to state that *burnout* is a specific process related to stress, one linked to the demands and to the conditions offered at the work-place. The term *burnout* was then used in 1974 by H. J. Freudenberger, and by Christina Maslach in 1976, in their studies on professional exhaustion. There are many definitions of the term *burnout*, some of these mentioned at the following online source:

[http://fr.wikipedia.org/wiki/Syndrome\\_d%CAepuisement\\_professionnel](http://fr.wikipedia.org/wiki/Syndrome_d%CAepuisement_professionnel)

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Here are some definitions of the term ***burnout***:

- *Burnout* is a state of emotional exhaustion, of depersonalization and of diminished performance, likely to occur in the case of persons working in jobs like Public Relations (Christina Maslach, Susan Jackson, 1986).

- Maslach (2001) sees *burnout* as a syndrome of physical and emotional exhaustion implying the development of negative self-esteem and of a negative professional attitude, leading to loss of involvement and to a lack of positive feelings. *Burnout* is a syndrome of emotional exhaustion, of depersonalization and of diminished involvement in professional development (Susan Jackson, Michael Leiter, Christina Maslach).

Professional exhaustion is, therefore, the result of chronic stressful conditions and of the feeling that at the work-place there is a discrepancy between personal abilities and the real working conditions.

Maslach and co.(1981, 1986, 1999), Aluja, Blanch, Garcia (2005), identified *three dimensions of professional exhaustion*.

a) ***Emotional exhaustion*** (excessive emotional demand, the feeling that one is at the verge of emotional collapse);

b) ***Depersonalization or the dehumanization of interpersonal relations*** (seen as a decrease in empathy, insensitive relations, aloofness-detachment, indifference and/or cynicism towards those who normally are the beneficiaries of one's services);

c) ***Diminishing motivation and professional involvement, a decrease in performance*** (accompanied by a feeling of incompetence, of inability to accomplish anything, of a reduced work capacity).

There are several types of ***professional exhaustion symptoms***:

a) *Psychosomatic and somatic symptoms*;

b) *Psychological symptoms*;

c) *Psycho-social and occupational symptoms*.

The onset of professional exhaustion is progressive, and its evolution takes a significant amount of time. Burnout has negative consequences that incur *psychological costs* in the individual's case, *financial costs* for the *organization* and *social costs* for the family and for the community.

## 2. Models regarding the sources of burnout and professional stress

Along the years many different models regarding the sources of burnout and professional stress have been devised.

***The “Demand-Control” Model*** elaborated by Karasek (1979, 1998) is, according to Fessier and Moulin (2005, p. 34), one of the most renowned models that explain professional stress. This model focuses for two dimensions: a) “*psychological job demands*”, namely the organizational requirements and limitations imposed on the individual; b) *the freedom of making decisions* granted to the employee, namely the opportunities to decide and to control what goes on at the work-place.

Fessier and Moulin, in “*Santé et bien-être des enseignants en Suisse romande*” (2005), show that Karasek’s model was reused, completed and developed by many researchers based on the particularities of their respective fields of activity and the results of their own research. Here are some **versions of Karasek’s model:**

**a) Payne, Fletcher** (1983) and **Doudin, Curchod-Ruedi, Peter** (2009) added to Karasek’s model a third dimension: **the social support**, which refers to three aspects: a) *hierarchical support* (directive), having two components: the practical support and the emotional support; b) *peer support*; c) *extra-professional support* (within the family, among friends, etc.).

**b) Friedman’s model** (2000), in which the onset and the evolution of burnout are examined in two different ways: a) on the cognitive level, it is seen as resulting from the feeling of personal and professional failure; b) on the emotional level, when the teacher feels overwhelmed by work overload, a state that may be followed by emotional exhaustion. Stressful events have a negative impact on the person either on one of these levels or on both.

**c) Lourel and co.** (2005) put forward a **multi-factorial model** according to which job demands and freedom of decision are seen as interrelated exogenous variables that have a direct impact on the three dimensions of burnout, whose residual variables are correlated.

**d) Some researchers who worked on establishing models pertaining to the causes of burnout in the case of teachers** and proposed causal model of vocational teacher stress (Adams, 2001), also take into consideration *the idealistic expectations of the teachers*, especially of the ones new to the field, *expectations often not met by the reality of school-life*. Other models include *the inappropriate organizational structure and the insufficient social support* (Janos, Georges, Parent, 1998).

### 3. Research regarding teacher burnout

Numerous studies have shown that a huge number of teachers have suffered from stress or professional exhaustion (Dionne-Proulx, J., 1995; Adams, 2001, Cox and co., 2005; Corten and co., 2004; 2007 )

*Perceived stress* plays the role of a mediator in the relation between social support, on the one hand, and perceived performance on the other hand. *Perceived control* is based on the assessment of the threat and on the personal resources. The environmental and the situational factors of the perceived stress and of the perceived control are: the nature of the situation, of the event, its duration, its ambiguity, its controllability and the available support (Bruchon-Schweitzer, 2001, p. 73-74). The benefic effects of the perceived control are a result of both the assessment of the aversive situation that the individual performs, and of the individual’s assurance that s/he is capable of an efficient behavioral response.

*The European Trade Union for Education (ETUE)* devised a project entitled “*The Optimisation of the Expertise on Teachers’ Professional Stress and of the*

*Assistance Offered to Organisations which Are ETUE Members.*" The project was devised between November 2006 and December 2007 and was based on the answers given to the Professional Stress Questionnaire by teachers from 27 European countries, Romania being one of them. Data analysis pointed to similarities but also to some differences in the way that teachers from different countries classify stressors and stress indicators. In Bulgaria, **Romania** and Hungary there featured a relatively high number of stressors and stress indicators.

The figure 1 below outlines our comprehensive model of the influence that stress factors have on professional exhaustion in the case of teachers.

### 3.1. Research methodology

**The objective of this study:** Pointing the level of perceived stress in case of teachers and that of dimensions professional exhaustion (burnout).

#### Specific hypotheses:

**1) Perceived stress** is higher in the case of female teachers than in the case of male teachers. In the case of female teachers the frequency of **perceived stress** is higher than in the case of their male counterparts.

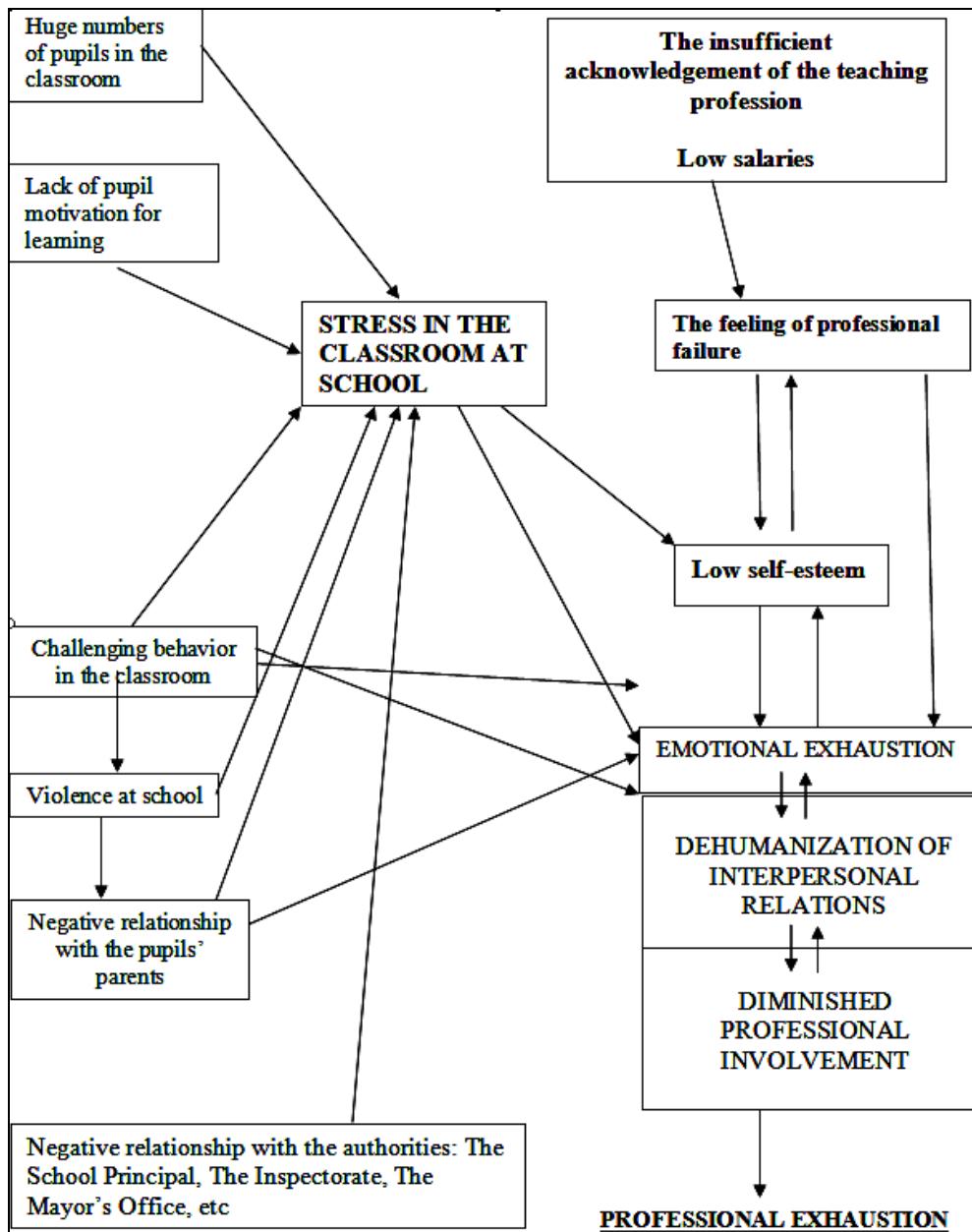
**2)** For both female and male teachers there is a strong connection between **the level of perceived stress and that of emotional exhaustion**. Female teachers are especially predisposed to emotional exhaustion when the level of perceived stress is above-medium.

**3)** For both female and male teachers there is a strong connection between **the level of perceived stress and that of the depersonalization** at the level of interpersonal relations.

#### Participants of study:

**Table I**  
**The socio-demographical characteristics of the sample of teachers (N=236)**

	<b>Women</b>	<b>Men</b>
<b>Total number of participants (N=236)</b>	<b>155</b>	<b>81</b>
<b>Age-groups (N):</b>	<b>N:</b>	<b>N:</b>
23 - 30 years of age	38	15
31 – 40 years of age	45	26
41 - 50 years of age	42	25
51 – 57/60 years of age	30	15
<b>Age: average / standard deviation</b>	38.6 (12.4)	42.5 (9.5)
<b>Teaching experience: mean / standard deviation</b>	19.5 (11.4)	23.6 (10.8)
<b>School type:</b>	<b>N:</b>	<b>N:</b>
<b>Primary-school</b>	40	21
<b>Secondary-school</b>	50	30
<b>High-school</b>	65	30



**Fig. 1.** The model showing the influence of stressors on teachers' professional exhaustion  
(V. R. Preda)

The research was carried out during the 2008-2009 and 2009-2010 school years. The investigation was performed at the respective schools, but sometimes the teachers filled in the forms home and at other times they were consulted during different training courses.

### **3. 2. Research instruments:**

**1) The Perceived Stress Scale**, elaborated by Cohen and Williamson in 1988 – translated and adapted – is a self-assessment type of questionnaire that measures the feeling of daily stress. The scale was designed starting from the transactional approach to stress. The internal coherence of the scores obtained by Lourel, Gana and Wawrzyniak (2005, p. 231) with the *Perceived Stress Scale* has proven to be satisfactory (alfa coefficient = 0.82).

**2) The stress level self-assessment questionnaire** (translated and adapted from P. Légeron). This questionnaire contains 12 statements with reference to the frequency and the intensity of the perceived stress.

**3) The Maslach Burnout Inventory (MBI)** – translated and adapted – is a 22-item questionnaire, in which the items are assigned to three groups, in order to assess three dimensions on a Likert-like scale of intensity/frequency:

- **emotional exhaustion**, defined as the feeling of exhaustion on the emotional level that results from one's activity at the workplace, is assessed using 9 items (numbered 1, 2, 3, 6, 8, 13, 14, 16, 20);

- **depersonalization (dehumanization of interpersonal relations)**, taking the form of indifference, insensitivity towards the people that one comes in contact with at the workplace, is assessed using 5 items (numbered 5, 10, 11, 15, 22);

- **personal professional involvement/development task (fulfillment)**, consisting in the feeling that one is competent and benefits from rewarding achievements in one's professional life (self-accomplishment), is assessed using 8 items (numbered: 4, 7, 9, 12, 17, 18, 19, 21).

### **3. 3. Data analysis and the interpretation of the results regarding perceived stress and its effects in the case of teachers**

**The hypothesis** that a higher number of female teachers display greater levels of perceived stress than male teachers do **was confirmed**. *We have also confirmed the hypothesis that in the case of female teachers the frequency of perceived medium-level and above medium-level stress is higher than in the case of their male counterparts.*

In order to verify the hypothesis that female teachers display a level of perceived stress which is higher than that of their male counterparts, we have processed the data obtained from 155 female teachers and from 81 male teachers working in an urban environment who were asked to fill in **the stress level self-assessment questionnaire** (translated and adapted from P. Légeron). *We must add that these were the only samples of teachers willing to fill in this questionnaire and proved us with the completed forms.*

The data regarding the level of perceived stress that we obtained after the administration of the **stress level self-assessment questionnaire** to the group of participants are presented in the table below and in the diagrams.

The statistic processing was made by using the *SPSS 13 program*.

**Table II**

### **The classification of teachers (%) function of the level of perceived stress**

Stress level	Stress below medium-level (Global score of 6 to 12)	Medium-level stress (Global score of 13 to 20)	Stress above medium-level (Global score higher than 20)
<b>Women (N= 155)</b>	<b>31.81% (N=49)</b>	<b>9.09% (N=14)</b>	<b>59.10% (N=92)</b>
<b>Men (N= 81)</b>	<b>44.45 % (N=36)</b>	<b>22.22% (N=18)</b>	<b>33.33% (N=27)</b>

The data presented above show that *we have verified the hypothesis that female teachers display a level of perceived stress which is higher than that of their male counterparts. We have also confirmed the hypothesis that in the case of female teachers the frequency of perceived medium-level and above medium-level stress is higher than in the case of their male counterparts.*

### **3.4. The degree of burnout occurrence manifestation of female and male teachers**

Taking into account the significance of the scores for the three burnout dimensions, here is a comparison between the level of manifestation of the professional exhaustion symptoms in female and male teachers investigated by using The Maslach Burnout Inventory.

**Table III**

### **The comparison of female and male teachers function of the different degrees of manifestation of the burnout dimensions (male teachers: N=81; female teachers: N=155)**

Burnout dimensions	Emotional Exhaustion	Depersonalization of interpersonal relations	The feeling of professional involvement/ fulfillment
<b>Burnout degree</b>	<b>High Medium Low</b>	<b>High Medium Low</b>	<b>High Medium Low</b>
<b>Female Teachers (N) (%)</b>	<b>53 65 37 34.19 41.93 23.88</b>	<b>61 49 45 39.35 31.61 29.04</b>	<b>66 47 42 43.22 30.32 26.46</b>
<b>Male Teachers (N) (%)</b>	<b>15 45 21 18.51 56.25 25.24</b>	<b>19 25 37 23.29 30.92 45.75</b>	<b>35 24 22 43.20 29.62 27.18</b>

The table III above shows that both female and male teachers display medium scores for the dimensions of *emotional exhaustion* and the *depersonalization of interpersonal relations*. However, male teachers exhibit a *lower degree of professional involvement/fulfillment*, which means that they are less motivated than female teachers. Moreover, many female teachers whose score was above medium are more actively involved in the instructional/educational activities with their pupils, due to their increased empathy and motivation.

*The female teachers are more predisposed to emotional exhaustion under increased professional stress than male teachers.*

- When the Chi-Square ( $\chi^2$ ) test was administered, highly significant differences ( $p < 0.000$ ) were noticed in what regards the effect of perceived stress on emotional exhaustion, not in the case of all teachers who displayed below and above average perceived stress, regardless of gender. For female teachers with above average perceived stress levels, emotional exhaustion appears more frequently and reaches higher levels.

However, in both female and male teachers emotional exhaustion and personal relations dehumanization do not influence negatively to a great extent the feeling of professional involvement and fulfillment. Thus, only 27.18 % of the male teachers and 26.46 % of the female teachers declared that they have reduced feelings of **professional involvement and fulfillment**, such feelings rating high in the case of 43 % of the teachers interviewed. Consequently, despite emotional exhaustion, only about  $\frac{1}{4}$  of the teachers display diminished motivation and lower degrees of professional involvement.

**Thus, the hypothesis that there is a strong connection between the frequency and the intensity of stress, on the one hand, and teachers' emotional exhaustion, on the other, has been confirmed.**

The data obtained through our research, which are in agreement with that of other researchers (Adams, 2001, Genoud, Brodard and Reicherts (2009), shows that various stressful contexts and situations which constitute part and parcel of the teaching profession can cause negative emotions due to pupils' behavior, to the lack of social appreciation when it comes to their activities and efforts, to the low salaries, to the much too great amount of work due to an overloaded curriculum, due to time management problems, to the inappropriate environment in schools, and, last but not least, to the lack of organizational support. Besides these stressors, there are also others, such as confusing issues in what regards the roles and responsibilities of people supposed to take part in the school's social environment (different persons from the City Council, the Mayor's House, the Inspectorate, etc.); the paradoxical requirements of a society that casts violent criticism at the school, making unrealistic demands of this institution, as if the school could on its own regulate each and every instructional or/and educational issue of each student.

### **3.5. The correlations between the Dimensions of Professional Exhaustion**

Regarding the correlations between the three dimensions of professional exhaustion (table IV), data analysis points to correlation coefficients (r) that have a smaller value than the one of those obtained by Maslach and Jackson (1986), by Dion and Tressier (1994) and by Genoud, Brodard and Reicherts (2009).

The analysis of the results shows that **emotional exhaustion** is an important factor in the process of **professional exhaustion**, a fact previously noticed by Maslach and Jackson (1986) and by Dion and Tressier (1994).

**Table IV**  
**The correlations (r) between the three dimensions of professional exhaustion**

Burnout dimensions/Correlation coefficients	A	B	C	D
Emotional exhaustion - Depersonalization of interpersonal relations	0.45**	0.52**	0.34*	0.48*
Emotional exhaustion - Degree of professional involvement/fulfillment	- 0.32*	-0.22	-0.27	- 0.33*
Depersonalization of interpersonal relationships - Degree of professional involvement/fulfillment	- 0.28	-0.26	-0.26	- 0.32*

\*  $p < 0.05$ ; \*\*  $p < 0.001$ ; A – our study ( $N=236$ ); B – Maslach and Jackson's study ( $N = 1.067$ ); C – Dion and Tessier's research ( $N=228$ ); D – Genoud and co. ( $N=787$ ).

In the case of teachers we witness **a certain connection between the frequency and the intensity of perceived stress and the degree of depersonalization of personal relationships**. Thus, upon the administration of the Pearson Chi-Square ( $\chi^2$ ) test we noticed that the differences regarding the effect of perceived stress on female teachers with above-average levels as compared to those with average or below average levels of perceived stress are of little statistical significance ( $p = 0.02$ ). However, in the case of the female teachers with above-average levels of perceived stress the depersonalization of interpersonal relationships occurs more often and with greater intensity.

Upon the administration of the Pearson Chi-Square ( $\chi^2$ ) test we noticed significant differences ( $p < 0.000$ ) in what concerns the effect of perceived stress on the depersonalization of interpersonal relationships in male teachers with above average levels of perceived stress as compared to those with below average levels. In the case of male teachers with above average levels of perceived stress the depersonalization of interpersonal relationships occurs more often and with greater intensity.

- *The hypothesis according to which in the case of teachers there is a strong link between the frequency and intensity of perceived stress and the degree of depersonalization of interpersonal relationships was only partially confirmed.*

*- In the case of teachers there is a certain connection between **emotional exhaustion** and **the degree of depersonalization of interpersonal relationships**, the hypothesis that this link is strong being only partially confirmed. Therefore, we can argue that the depersonalization of interpersonal relationships is the result of cumulative multi-factorial agents, as there are certain personality traits that shape the stressors, thus modifying their impact.*

In the case of **all the male teachers** there is a highly significant very strong connection ( $p < 0.000$ ) between emotional exhaustion and the degree of depersonalization of interpersonal relationships. Our research shows *the existence of a strong link between emotional exhaustion and the degree of depersonalization of interpersonal relationships* (at significance between  $p < 0.02$  and  $p < 0.000$ ) *in the case of male teachers* aged 23 to 50; this link is even stronger for the age-groups 23 – 30 and 31 – 40. On the other hand, the age-group analysis based on the criterion Chi-Square Tests ( $\chi^2$ ) shows that in the case of female teachers there is no significant link between emotional exhaustion and depersonalization. *Consequently, age itself has neither a strong, nor a direct influence on the degree of association between emotional exhaustion and the depersonalization of interpersonal relationships in the case of female teachers.*

*- There are statistically significant differences between the means obtained by the populations from which the two samples (male and female teachers) were extracted in what concerns the **depersonalization of interpersonal relationships**, the significance threshold being  $p = 0.01$ . Due to stressful factors, female teachers exhibit a stronger depersonalization of interpersonal relationships than male teachers do.*

*- There is a certain link between **the teachers' level of perceived stress**, on the one hand, and **their degree of professional involvement and their feeling of professional fulfillment** on the other hand. Thus, even under conditions of above-medium perceived stress, **most female teachers** (58.5 %) *display a medium or an above-medium level of professional involvement*. However, 41.5 % of the female teachers displaying an above-medium level of professional stress *display low levels of professional involvement*, being de-motivated and unsatisfied by the results obtained.*

*- Of the **male teachers** with above-medium levels of professional stress, 25.7 % show decreased professional involvement, being quite de-motivated and unsatisfied with their results and with their professional status.*

*- As different from female teachers, under conditions of **below-medium stress**, fewer male teachers show high levels of professional involvement, (only 8.7 % of the cases), most of them displaying low levels of professional involvement (54.3 %) and some exhibiting mean levels of involvement (37.0 %).*

At first sight, the data presented above may seem surprising, **but we have to take into account the fact that the degree of professional involvement in the teachers' case, be it low or high, is determined by many factors**. Other researchers point out, as well, that there is no direct straight link between teachers' perceived stress and a lower level of professional involvement or their lack of motivation (Dionne-Proulx, 1995; Di Fabio, Majer și Taralla, 2006), and this is due to the many factors involved in personal

professional involvement and development. *The degree of teachers' professional involvement is connected to their feelings of self-efficacy.*

*Successful task accomplishment* provides the most important source of self-competence expectations. Successful experiences increase expectations of task-solving, while repeated failures decrease expectations of professional success.

- Teachers with high-level stress and with an increased anxiety level, as well as with a diminished, predominantly external locus of control, must learn to master efficient coping strategies, by asking for psychological counseling or for psycho-pedagogical interventions, in order to prevent professional exhaustion. Moreover, in schools, it is essential to optimize classroom management, school management and the educational environment.

**Practical recommendations:** Teachers with high-level stress and with an increased anxiety level, as well as with a diminished, predominantly external locus of control, must learn to master efficient coping strategies, by asking for psychological counseling or for psycho-pedagogical interventions, in order to prevent professional exhaustion. Moreover, in schools, it is essential to optimize classroom management, school management and the educational environment.

Therefore, it is compulsory to ensure that the initial training and, especially, the continuous lifelong training of teachers, both offer more intensive psycho-pedagogical training regarding educational management, challenging behavior management and conflict solving management. At present, this can be accomplished mainly by offering such training during the MA program and by designing a specific curriculum for training courses.

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**ROMANIAN EDUCATIONAL SYSTEM AND MULTICULTURALISM.  
CHALLENGES IMPLIED BY THE NATIONAL LAW IN EDUCATION:  
FROM ENSURING MINORITIES' RIGHTS  
TO SEGREGATION DANGER**

**ION ALBULESCU\***

**ABSTRACT.** All educational programs that are based on the idea of multiculturalism must found on the principle of eliminating discrimination and of eliminating the dichotomy between the culture belonging to majority and the culture belonging to minority, as well as on a lot of approaches developed for preserving and valorizing specificity. The National Law in Education from Romania comprises a series of regulations regarding the way schools function, these schools being organized on ethnical criteria, thus, education language within these schools being the language of the respective minority. These regulations can lead, aspect underlined by this research, to segregation and isolation.

**Keywords:** *multiculturalism, education, minorities' rights, segregation.*

**ZUSAMMENFASSUNG.** Jeder Erziehungsprogramm, der die Idee der Multikulturalismus in Betracht nimmt, muss auf dem Prinzip der Aufhebung der Diskriminierung und der Dichotomie zwischen der Kultur der Mehrheit und der Kultur der Minderheiten, sowie auf einer Reihe von Verfahren, die die Aufrechterhalten und Verwertung der Spezifität sich gründen. Das Gesetz über der nationale Bildung und Erziehung in Rumänien enthält eine Reihe von Bestimmungen hinsichtlich der Organisation der auf ethnische Kriterien gestalteten Schulen, wo der Unterricht in der Minderheitssprache gegeben wird. Die Bestimmungen können, so wie wir in diese Studie zeigen, zu Segregation und Isolation führen.

**Schlüsselwörter:** *multikulturalismus, erziehung, minderheitsrechte, segregation.*

### **Introduction**

Pluralism represents a fundamental value in Romanian society, it implying respecting the difference among the various forms of cultural manifestation and, in the same time, consolidating all ethical communities' cultural identity. A national right ensured and guaranteed by constitution for all ethnical minorities from Romania is using mother tongue language within cultural and educational systems. People belonging to different ethnical minorities have the right to be different, serious efforts

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being conducted at the level of the whole social system, in general, and in particular at the level of educational, in order to prevent the annihilation of diversity. Education can be considered due to its anti-discriminating approaches, the guarantee for a multicultural functional society, factor for the democratic stability and for diminishing conflicts.

### **Legislative framework for using mother tongue language in education**

Multiculturalism is a notion with multiple significant valances within the debates regarding educational and cultural policies referring to national minorities. This interpretation is not exclusively due to the reputation of the term and of the set of ideas related within the political and intellectual discourse, but also to a need emphasized by the intellectual debates, the need to find alternatives to the various restrictive discourses regarding the problem of handling ethnical and cultural diversity (G. Andreescu, 1999).

The ideology of multiculturalism promotes the recognition of cultural variety that can be identified within a society and a series of approaches that can be developed for preserving and valorizing specificity. The aim is to make well known, visible minority ethno-cultural groups and, as a consequence, to accommodate and to open perspectives for majority society regarding cultural models belonging to minority groups. This type of approach places on the first position values, objectives and strategies specific for the intercultural and multicultural education.

Education in Romania developed by using the national minorities' languages promotes multiculturalism and implicitly developing a multicultural education. The notion of „multicultural education” refers to the whole amount of educational programs that answer to the needs that comes out in the light due to the coexistence within the multi-ethnical environment. Its aim is to facilitate the affirmation of the ethno-cultural minority groups, and as a consequence, to facilitate the openness of the majority society towards the cultural models particular to them.

The notion of multicultural is to be found in the *National Law in Education from Romania* (2011), according to which people being part of the national minorities have the right to study and to follow educational programs in their mother tongue language, at all the levels, types and form of educational program, from the pre-university educational system component. There are to be mentioned the public Institutions for Superior Education which also have educational programs developed in the language of national minorities, they having the status of multicultural and multilingual universities: Babeş-Bolyai University from Cluj-Napoca (educational programs are developed in Romanian, Hungarian and German languages), The University of Medicine and Pharmacology from Târgu-Mureş (it having educational programs developed in Romanian and Hungarian), the University of Drama Art from Târgu-Mureş (it having educational programs developed in Romanian and Hungarian). All Romanian citizens or citizens coming from European Union countries or from Swaziland confederation, despite their mother tongue language or the language they studied in previously can attend and can study being enrolled in all the educational programs developed in Romanian language, in National minorities languages or in any other international language.

## ROMANIAN EDUCATIONAL SYSTEM AND MULTICULTURALISM.

If within a certain territorial-administrative unity functions more than a single education institution, their activities being developed in the language of the national minorities, at least one institution has to prove judicial representation, for every mother tongue language, no matter the number of the pupils. If at the level of a town or at the level of a village the secondary or college education institutions are the single institutions that develop educational programs in the national minorities languages, they are being offered judicial representation, despite the number of pupils they have enrolled. If in the local home pupils do not have the possibility to study in their mother tongue language they are being covered the transportation costs to the nearest school where the education programs develops in their mother tongue language or they are being ensured for free accommodation and meal in the boarding room.

In pre-university education, teaching and learning activities in the case of native language and literature, in the case of history and the traditions of the respective national minorities and in the case of musical education, develop based on specific programs and methodologies elaborated by experts in that respective national minorities' language and cultural fields, they being approved according to the law. In the secondary education developed in national minorities' languages, *History and the traditions of the respective national minorities*, is introduced as studying object, it being developed in their mother tongue language. Moreover, within the syllabuses and textbooks for history is to be reflected the history and the traditions of the national minorities from Romania. If pupils belonging to national minorities groups attend the education system that develops in Romanian Language or in other language different from their maternal one, they can ask for fallowing as studying object *Native Language Literature*, as well as *History and the traditions of the respective national minorities*.

Within the primary, secondary and college education that develops activities in national minorities languages, the studying objects such as *Romanian history and geography* are being taught in these languages, fallowing syllabuses and textbooks identical with those for the classes taught in Romanian, mandatory being to write and to learn Romanian proper and toponymical names and in Romanian language, too.

Within pre-university education the admission and the graduating exams can be sustained in the language in which the studying took place, under the low conditions.

The didactical materials specific for the studying objects taught in maternal language are ensured by Ministry of Education, Research, Youth and Sport (M.E.C.T.S.). There is also possible to have textbooks elaborated in the teaching language of the national minorities, textbooks translated from Romanian or even imported textbooks, approved by M.E.C.T.S., in the situations when several titles are not edited due to the reduced number of exemplars from a certain edition.

National Minorities have the right to proportional representativeness according to the number of classes, at the management level in a certain education institution, county inspectorates or in equivalent institutions, as long as professional competences criteria are respected. Within the education institution in which the teaching language is also a minority language, one of the managers will be a teacher belonging to that respective minority, having into considerations the professional competences criteria too.

Teachers for the groups or classes that study in the language of the national minorities have to prove professional competence in the language of that respective national minority and have the right to attend training and improving sessions in the teaching language, sessions organized either in our country or abroad. An exception is represented by the teachers that teach Romanian Language and Literature. For ensuring an adequate internal communication and a proper relationship with the parents, in the education system developed in the language of the national minorities teaching language can be used.

Through these types of regulations Romanian educational system supports national ethnical communities for affirming their different culture, in order to facilitate the affirmation of all the citizens, members of our society, as well as for ensuring the affirmation of the ethno-cultural groups. The type of multiculturalism that is promoted in this way ensures tolerance, respect and the positive appreciation from the people towards different cultures from the one to which they belong.

### **The status of Romanian Language**

At the level of pre-university education developed in the language of the national minorities all studying subjects are approached by appealing to their native language, an exception being made in the case of Romanian Language and Literature, this object being taught according to special elaborated, for that respective minority, syllabuses and textbooks. Studying Romanian Language as official language during schooling period is mandatory for all Romanian citizens, no matter their nationality. Romanian Language and Literature is taught at the level of the primary education according to special elaborated syllabuses and textbooks, for that certain minority. At the level of secondary education Romanian Language and Literature is taught according to syllabuses identical to the ones specific for the classes studying in Romanian language, in order to be able to implement this aspect there are specific textbooks for this situation. At the level of college education Romanian Language and Literature is taught according to syllabuses and textbooks identical with the ones specific for the classes studying in Romanian Language. The focus on establishing a conceptual unity between the syllabus and the mandatory feature of studying its thematic content is important in order to offer equal chances during the graduating exams for all pupils.

The first exception, teaching Romanian Language and Literature is organized based on the textbooks used in the education institutions in which Romanian language is the studying language, as a response to parents' or legal representatives' request, as a response to the request elaborated by the national minorities' organization which is represented in Romanian Parliament, to the parliamentary group of national minorities, in case when that respective minority has not parliamentary representativeness. The assessments for Romanian Language and Literature are elaborated based on the special program and the assessment tests, the exams contents, no matter the type of examination, developed at the level of the pre-university and the semester examinations for the pupils who attend an education system developed in national minorities' languages, are elaborated based on the didactical-methodological requests established through the National Curriculum.

### **Multiculturalism and the segregation danger**

Curricular documents adopts multicultural and intercultural education as a positive valorizing tool of the differences and of reciprocal improvement, through the possibility of knowing the other, through the exchanges that are based on reciprocal respect. In this way the dichotomy between majority and minority culture can be eliminated with the aim of a positive attitude, opened towards cultural diversity.

Multicultural education, promoted through the curriculum addressed to the education based on Romania national minorities' education, represents a complex process which requires:

- a) the acceptance of equal rights and the elimination of the discriminatory practices;
- b) reciprocal knowledge through inter-cultural knowledge;
- c) interest towards others problems, promoting the tolerant attitude and reciprocal understanding;
- d) renouncing to stereotypes or false believes and developing „the culture of living together”;
- e) organizing common activities, collaboration and reciprocal help, making decisions and problem solving-all of these developed together.

The open perspective towards other cultures than the one belonging to majority represents one of the directions towards Romanian education system orientates as school is an optimal place for national minorities' affirmation. Thus, pupils belonging to these minorities are ensured the right to express their own identities, being created, in this way, the premises for demolishing false believes and stereotypes. It also has to be underlined that despite the level or the objectives concerning the debates regarding multiculturalism, ethnical boundaries constantly reproduced along time. Even if there are not to be mentioned relationships marked by inter-ethnical tensions, the difference representations facilitated the perception of distinct differentiating lines among ethical groups. This type of distinction that can generate tensions is to be identified at the level of the entire education system, aspect perceived by everyone. In order to prove this aspect we can mention what one of the deans from Babeş-Bolyai University underlines: „For a multicultural university, the way Babeş-Bolyai is, the tensions induced by interpretable regulations referring to the national minorities' rights become dangerous as they can enforce separation. In the XXI<sup>th</sup> century, when we should surpass the stage of working side by side and we should embrace the stage of working together, promoting real value, no matter the ethnical feature, we are forced to step back due to specific favors and momentum political interests” (C. Dobrotă, 2010, p. 128).

An important source for inter-community tensions can be the division of school based on ethnical criteria, education becoming a factor for separation and not for integration, aspect that question its status. The separation process is due to the fact that pupils socialize by using totally different languages, they study by using different textbooks, handling different types of pieces of information, in separated environment, being given financing according to different criteria. The process through which social relationships are weakened and pupils' intercultural interactions are divided is encouraged

in this way. In other words legislation offers the adequate framework for a certain educational politics that has already been functioned, a politics regarding finishing segregation on ethnical criteria at the level of Romania educational system, it spreading negative effects upon the entire society.

Social system can be seen as a combination of cultural models that offers the person techniques for living into society, techniques that allow social interaction and integration, according to certain expectances absolutely necessary in order to socially adapt. It is unanimous accepted that every culture has its own behavior patterns, they being for other people coming from different cultural surroundings strange. This is why every culture has to be studied within the constraints of its own meanings and values, being avoided the ethno-centrally approach, it being defined as „judging the other cultures by comparison with your own” (A. Giddens, 2000, p. 33). All the discourses that assume the requests of the late modernism will approach the term of „multiculturalism” as being in correlation with the one of „inter-culturalism”. A certain culture, according to C. Cucoş (2000), comes out to light by comparison with others, this comparison meaning transfers of values, generator of new practices, it being a source of reciprocal enrichment. The way education in national minorities’ languages in Romania is conceived implies this type of comparison, but it also opens the possibility of ethnical segregation. Education, especially in the case of Hungarian education, turned in even a more segregationist educational practice, it promoting numerically reduced intercultural communication relationships. In this way, Romanian pupils are separated from the Hungarian ones, „not only from a physical point of view, but also from a cultural one, everyone studying his own culture, turning the backside towards the others’ culture” (A. Miroiu, 1998, p. 59). Instead of multicultural programs for multi-ethnical schools and instead intercultural programs that could fit into the national curriculum, in Romanian educational system proves the tendency for segregation, for reclusion within mono-ethnical and ethno-centrally communities. If at a first level the result allows pupils to preserve their ethnical identity, at the second level we will have to face ethnical groups that knows nothing about each other, they tend to ignore themselves and to be defined by the lack of communication among them. Thus, instead of pluralism and integration by promoting the difference we tend towards assimilation or isolation.

Separations and reciprocal closed perspectives towards the others, approaches that lack fertilization and are even generators of conflicts, can be surpass through knowledge, comprehension, approval and respect proved to others’ culture. If the respect and the approval manifested towards the ethno-linguistic minorities’ culture do not represent a problem at the level of Romanian Educational system, the actual knowledge that the majority population has regarding the minority population is insufficient. In a great number of situations, it happens so that minority ethnical groups do not have knowledge about majority culture, the way it is presented through curricular documents such as syllabuses and textbooks.

Within nowadays school curriculum, beginning with *Abecedary*, going to humanistic disciplines, proper names belonging to other ethnical groups, non-Romanian creators, the other ethnical groups contribution to Romanian history are not

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to be identified. The Hungarian, German or Ukrainian writers do not appear in the mandatory textbooks, as if the single creators from Romania have and will have Romanian origin. On the other hand, minority ethnical groups sustain the separation of the schools or at least the separation of the distinct specializations within the schools where studying develops in Romanian language, as well as curricular differences at all levels. The main identified concerned in the case of majority groups which can be characterized through a strong unity is to claim an almost complete extension of mono-lingual politics and to isolated themselves within their own educational community. Intense political efforts are made in this respect, especially by the Hungarian political representatives of the minority they belong, they constantly invoking the right of cultural autonomy and even more.

Assuming cultural pluralism implies the recognition of the fact that every culture produces universally valuable significances, starting from a particular experience. Cultural pluralism raises not only the problem of defending diversity, but also the problem of cultural dialogue in the case when cultures recognize, going beyond the differences that exist among them, that all of them contribute to the enrichment of human experience and that all of them represent an effort of universalizing a particular experience. Promoting multiculturalism through educational system, as a way of defending minorities and their rights, often can lead to opposed situations, to a „closed community, hostile towards the existence of different cultures” (A. Touraine, 1996, p. 292). The right for being different, isolated from all the reflections on intercultural communication, can lead to cultural relativity, it being charged of conflicts.

Restraining the practice of Romanian writing and speaking in school only in the case of Romanian Language and Literature will transform Romanian language status as marginal element at the level of national minorities’ education, it gaining the status of foreign language. Under the circumstances in which there are no ethical constraints, putting into practice the legislation regarding minorities’ representativeness at the school and county inspectorate management level is considered unnecessary. But by applying these regulations local (Hungarian) ethnical minorities are offered supplementary rights, this leading to the situation in which majority ethnical group (Romanian) will be disadvantaged.

Regarding the problem of special textbooks addressed to national minorities, textbooks that could be even imported from abroad. In these circumstances children coming from national minorities groups can face problems in adapting to the social and institutional constraints. This aspect emphasizes willingness in losing control over several cultural processes part of the internal state order.

The main consequence of reducing the use of Romanian language within pre-university education is stressing segregation. Romanian, but also Hungarian young children recognize the existence of different ethnical tensions, they identifying the separation among schools based on linguistic criteria as the main cause for these problems and tensions. Regarding the teachers, both Romanian and Hungarian ones, they identify the same problems and the same solutions: the main source of tensions is the schools separation, this aspect leading to a politically imprinted feature for history textbooks. In other words, Hungarian responsible, teachers and school inspectorates

have already underlined that history textbook has been already politically imprinted; printing it abroad will increase the political-ideological content as curricular control system will depend on different political groups, according to legislation.

*National education law* (2011) approves that the number of pupils belonging to a certain minority to be lower, for having a studying group in minority's maternal language, in the small localities, than the required number. Pupils who have no access to studying in their maternal language in their local homes have the right to be ensured transportation to the nearest school where teaching develops in their maternal language or to be ensured accommodation and meal within those schools boardrooms. This is a type of super-discrimination. Through these regulations minority pupils are enrolled in a discriminating supplementary process. By putting into practice these differences we can face abnormal situations regarding the fact that theoretically there are no restraints concerning the number of kilometers within which a pupil is ensured transportation in order to be facilitated the possibility of studying in his maternal language, whereas any other pupil has a 50 kilometers established limit. Supporting pupils by covering transportation, accommodation and meal costs are other forms of over-support, this leading to a mechanism of privileges by comparison with majority.

Political and ideological considerations, especially in the case of Hungarian communities, increase the efforts for developing educational structures, which under the cover of the principle of autonomy based on ethnical criteria raise the segregation risk. Majorities' language and specific values are often neglected, with the aim of preserving identity, being artificially built barriers in front of communication and inter-ethnical knowledge. In an epoch of internationalism, globalization, integration, the separation and closeness tendencies based on ethnical criteria, are more than anachronic. No serious construction in the education field can admit a „ghetto” education, segregation on language, ethnical and religious criteria. A multicultural perspective characterized by presenting a human group in an autarchic manner, without the possibility of comparison or of „contamination” with other cultures may lead to the situation of fitting own limits and possibilities. An education system which allows the minorities' cultures affirmation must encourage, in the same time, a reciprocal integrality and openness, a certain familiarization with the other's specificity. Multiculturalism that comes out from the foundation of several separated schools or classes for minorities, where education in certain languages is ensured and the transmitted culture mainly focuses on the specific community is not enough. The multiplication of the contacts and of the reciprocal exchanges, possible to be realized through intercultural education, constitutes the manner through which is gained a welcomed inter-knowledge at the level of ethnical communities, a way of valorizing their cultural specificity.

### **Interculturalism necessity**

Education in the perspective of openness towards multiple cultural directions represents a completely justifiable approach as it aims person's a better insertion in a polymorphic spiritual world. This type of openness foresees the individuals' objectives by valorizing several particular or society features ensuring it a certain coherence,

solidarity and functionality degrees. Community solidarity is increased through the way symbols reproduction is handled within the respective cultural space, but also through the way the openness towards others socio-cultural structures. Through intercultural education the human being can be trained for perceiving, for accepting and for respecting the other's cultural specificity. Intercultural education implies that the very educational process to be developed in an interactional environment, by putting face to face the generators of the different cultural expressions.

Intercultural communication at the level of Romanian education system represents the values exchange accompanied by the corresponding significances among persons or groups that are part of different cultures. These exchanges can take place at idealistic, verbal, non-verbal, behavioral, organizational levels. Regarding intercultural communication C. Cucoş (2000) underlines that it implies two different components: personal communication and social communication. The first one claims the accomplishment of a certain competence, structured on three dimensions:

- 1) cognitive (the capacity of knowing the creations belonging to different cultures one meet, the history, traditions, institutions, believes, conceptions, moral rules, specific connecting modalities);
- 2) affective, emotional (the willingness express in order to adapt from an intercultural point of view by gaining emotional and motivational capacity to be empathic with the others);
- 3) operational (one's capacity to behave in a certain way, to try positive intercultural behaviors etc.).

The deeper intercultural communication is, more different would be the dimensions both for the knowledge about the others coming from different cultural settings and their acceptance. Knowing the others, one would get a better knowledge about himself that is why intercultural learning represents an important coordinate for every educational program.

Intercultural education is supposed to direct child's attention towards others' experience, towards his own identity and towards universal human values. A suitable educational politics regarding this aspect have to be based on the fact that if one belongs to a certain community this fact doesn't necessarily imply he completely identify himself with that certain community, on the idea of equal chances regarding education for all the groups within a certain society and on a curricular innovation that takes into account community features, but also community knowledge and inter-community communication. Ethno-cultural tensions, the intolerance and discrimination phenomenon can be avoided through intercultural education, a type of education which can improve the relational aspect in nowadays settings, inter-humane relationships being given a new dimension.

### **Conclusions**

Romanian Educational system allows the education of the persons belonging to the national ethnical minorities in their own language by acquiring their own culture. Both the legislation framework and the school curriculum promote multiculturalism,

allowing pupils' knowledge about their native culture. All in all, an educational system based on multiculturalism faces different risking situations, situations that have been presented, among which there can be mentioned: separation, segregation and isolation, all of them based on ethnical criteria. In order to prevent this types of risks intercultural education is a necessity, this meaning that within this type of education everybody will benefit on the presence of the pupils having different ethno-cultural backgrounds in order to valorize one's own culture and in order to get their attention towards their own cultural specificity, and, in the same time, towards the social cultural diversity. School has to teach pupils to leave together in a universe with different values but those co-exist and are based on reciprocal complementarities.

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