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Psycho physiological and family predictors of adjustment of the intellect and motivation of achievements*

The literature analysis in the framework of the problematics of this research showed that level and conceptual characteristics of the intellect as well as motivation of achievements are linked to, on the one hand with such parameters of the environment as the styles of the parental upbringing [4; 5; 6; 9], and on the other hand, particularities of hemisphere organization of the brain [8].

However family predictors (styles of the parental upbringing) and psychophysiological predictors (interhemispheric functional asymmetry), responsible for adjustment of the intellect and motivation of achievements remain still unexplored.

173 declining families took part in our study. The adolescents at the age from 13 to 17, students of secondary school №1 of Essentouky, and their parents were the respondents.

We have used in our study: method of the registration of electroencephalograms; conversations, tests and methods of mathematical statistics.

To register EEG we used a certified electroencephalograph "Entsefelan" version "Elitnaya-M" 5.4-10-2.0 (13.02.2004), made by MTB "Medikom" in Taganrog.

It uses 16 standard leads with unipolar scheme and ear ipsilateral referents to register electric brain waves. To assess interhemispheric functional asymmetry we used the coefficient of the frequency asymmetry (CFA) and absolute coefficient of the asymmetry (ACA). Computer processing of results is made by the programme Statistica 6. Methodical tools include: «Test of achievement motivation», created by A. Mekhrabian [7]. To reveal the level of the psychometrical intellect we applied the "Progressive matrices" by G. Raven [1]. To identify the styles of parental upbringing we used a test – a questionnaire of the parental attitude by A.Y. Varga, V.V. Stolin [3]. Methods by N.N. Braguina, T.A. Dobrokhotova were used to determine a motorial, sensory and general functional assymentry. [2]. All the sampling of children was exposed to the procedure of the qualitative evaluation of the intellect level and achievement motivation. We have distinguished three levels of achievement motivation: high (that corresponds to a longing for success), medium (that corresponds to a medium level of achievement motivation) and low (that corresponds to a motivation to avoid failure). On the basis of the intellect we recognize three levels: high (high and very high), medium (medium and a good standard), low (a reduced level, bordering level and a handicap).

In our study as we wanted to study adjustment of the intellect and motivation of

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achievements , we assessed the pairs of indices of the intellect and achievement motivation: medium-meduim, high-high, low-low. We considered as the maladjustment all the other pairs of indices. The application of the method of multiple-factor ANOVA let us specify that the significant influence on the intellect and motivation of achievements of children is exerted by such factors of parental upbringing (by Varga A.Y. and Stolin V.V.' questionnaire, like a scale 2 (social desirability or cooperation) ($F=26,559$, $p<0,001$), scale 1(acceptance-rejection), in what connection the adjustment of the intellect and motivation of achievements corresponds to the acceptance in parental style of upbringing $F=10,563$, $p<0,001$).

If we find the maladjustment of the intellect and achievement motivation, in the style of parental upbringing such scales as rejection ($F=26,559$, $p<0,001$), "a little looser" ($F=9,485$, $p<0,001$) and a symbiosis ($F=18,669$, $p<0,001$) are predominated.

To clarify the influence of FIA upon the adjustment of the intellect and achievement motivation we also used multiple-factor ANOVA. It was revealed that, in the group with adjusted level of the intellect and achievement motivation there was a sinistrocerebral type of functional assymetry. But in the group with the maladjustment of the intellect and achievement motivation there was a dextrocerebral type of functional interhemispheric asymmetry.

The significant discrepancy was received for both groups in accordance with the factors "asymmetry of the vision sense" ($F=4,17$, $p<0,05$) , "asymmetry of sense of hearing" ($F=10,682$, $p<0,01$), "tactile asymmetry" ($F=25,552$, $p<0,001$), "motorial asymmetry" ($F=4,814$, $p<0,05$), "general asymmetry" ($F=12,544$, $p<0,001$).

To find the intercommunication between indices of interhemispheric asymmetry and the level of the psychometrical intellect we applied the correlation analysis of the results according to G. Raven' test and indices of CFA (coefficients of frequency asymmetry) of frequency bands α, β1 in the background sample of EEG.

As the results we can cite the significant coefficients of band correlation in α –band for the pair of leads F7-F8 ($r=0,55$; $p<0,05$), in β–band for the pair of leads Fp1-Fp2 ($r=0,58$; $p<0,05$). In theta-band the significant coefficients of band correlation with indices of psychometric intellect were received for absolute coefficients of asymmetry (ACA) in the pair of leads F7-F8 ($r=0,29$; $p<0,05$), as well as for relative coefficients of asymmetry in the same pair ($r=0,32$; $p<0,05$).

The multiple-factor ANOVA was used to assess the influence of interhemispheric asymmetry on the level of psychometric intellect. The expressed interhemispheric asymmetry in theta and β– frequency bands in front leads has a great influence on the level of psychometric intellect: for the pair of leads Fp1-Fp2 in theta band ($F=3$; $p<0,05$), F7-F8 ($F=1$; $p<0,05$); for the pair of leads F3-F4 in β–band ($F=6$; $p<0,01$).

With the help of the multiple-factor ANOVA, we appraised the influence of the interhemispheric asymmetry on the level of achievement motivation. The significant influence was recorded in pairs of leads C3-C4 in α –band ($F=2,39$; $p<0,05$). According to received data in our study, there is a direct correlation dependence between achievement motivation of children and their parents. ($r=0.31$, $p<0.05$). However

"mother's" and "father's" effects are not equal. So, it was discovered, that the correlation of achievement motivation in pairs "mother-son" is inversely proportional ($r=-0.43$, $p<0.05$), but in pairs of relatives "father-son", the correlation of achievement motivation is directly proportional ($r=0.8$, $p<0.01$).

Conclusions. In pairs of relatives of the first degree of propinquity (parents-children) there is a significant correspondence according to indices of motorial asymmetry. In pairs of relatives "father-son" there is a significant correspondence of indices of the motorial, sensory and general functional assymentry. Higher level of psychometric intellect of children corresponds to a deeply expressed sinistrocerebral asymmetry of front and centre parts of cortex. The expressed sinistrocerebral functional asymmetry according to electroencephalogram is a predictor of adjustment between the level of the intellect and achievement motivation, the expressed dextrocerebral functional asymmetry testified by EEG is a predictor of maladjustment between the level of the intellect and achievement motivation. Such styles of parental upbringing as the rejection and hostility are in the inverse dependence with children's achievement motivation, but acceptance and cooperation, positive interest are in direct dependence with high level of achievement motivation of children. The achievement motivation is also linked to the achievement motivation and age of the parents.

THE LITERATURE

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