

RELATIONSHIP BETWEEN TEMPERAMENT PROPERTIES AND HEART RATE VARIABILITY INDICES IN EARLY CHILDHOOD

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The goal of the study was to examine the influence of upbringing conditions on the relationship between temperament factors and heart rate variability.

The study involved children aged from one and a half to three and a half years: 48 children aged from 17 to 38 months living in two-parent families (30 boys and 18 girls, mean age $28,7 \pm 7,8$ months) – control group, and 51 children, aged from 18 to 43 months living in the orphans' house "Yolochka" (Simferopol) (31 boys and 20 girls, mean age $32,6 \pm 5,8$ months) – the main group.

To diagnose the temperamental characteristics, the institution's psychologists were asked to fill in the Russian-language adapted short version of the Early Childhood Behavior Questionnaire (ECBQ) which consists of 36 questions describing various elements of children's behavior. There were assessed the three ECBQ factors of temperament: Negative affectivity, Surgency/Extraversion and Effortful Control.

The correlation analysis of the data belonging to the control group of children didn't show statistically significant relationships between the indices of temperament and the HRV. The separate analysis of the girls from the group of children living in families revealed a positive correlation between the level of Surgency/Extraversion and the HRV variation coefficient ($r_s=0,53$, $p=0,04$) and a negative correlation between the same temperament scale and the high frequency component of the HR specter ($r_s=-0,69$, $p=0,004$).

Unlike the main group, the correlation analysis of the psychophysiological indices for the whole main group of institution-reared children provided a number of statistically significant relationships. The Extraversion level negatively correlated with the value of the

total spectrum power of HRV VLC ($r_s = -0,34$, $p = 0,03$). The total spectrum power of the very low-frequency component of HRV, reflecting the activity of the central regulation of levels, apparently, is important not only in vegetative maintenance of the HR in children. To some extent, it reflects the children's individuality because its relative value showed statistical relationship with the level of Negative Affectivity ($r_s=0,33$, $p=0,04$).

The sample of boys from the main group showed even stronger relationship between Negative Affectivity level and the total specter power of the low-frequency component of the HR ($r_s=0,44$, $p=0,03$).

The discovered relationships between temperamental properties and the indices of the HR vegetative regulation complies well with the individuality's psychobiological model by S.R. Cloninger according to which temperamental characteristics are considered to be related to brain's certain biochemical systems.

The data collected in our previous and current research testify to the necessity of the follow-up studies of the temperament nature. It looks quite feasible that further analysis of relationships among brain's total electrical activity, temperament and HRV might help us build one more bridge linking central and autonomous mechanisms underlying the development of children's behavior. This will hopefully help us design the means to compensate for the negative effects of emotional deprivation in children through the use of modern technologies.

Keywords: vegetative regulation, heart rate variability, orphans, temperament factors.

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