

Interrelation between Extraversion Level, Neuroticism and Aggressiveness

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Aggression is significant problem of modern society. Two main forms of human excessive aggression are described: impulsive and controlled. The first form is seen in patient with depression and is characterized by high emotional reactions and autonomic responses. The second type is revealed in patients with personality disorders and is characterized by low emotional and autonomic responses. We believe that the genetically determined features of neurohumoral status provide the predisposition of organism to impulsive or controlled aggression in humans (to spontaneous and adaptive aggression in animals). In the experiments on animals (submissive and dominant rats) we revealed the dependence of male behavior type on blood plasma testosterone level, tight negative correlation between testosterone level and hypothalamic pituitary adrenal axis hormones, the imbalance between monoamines (noradrenaline, serotonin, dopamine) in frontal cortex, hippocampus, cerebellum. Submissive rats can serve as experimental model of depression. Dominant rats demonstrate adaptive aggression. Before the study of neuro hormonal features in people predisposed to different types of aggression, we decided to investigate the relationship between temperamental characteristics and aggressiveness. The interrelation between extraversion degree, neuroticism level and aggressiveness index was studied in young men.

The aggressiveness index was found to depend on both extraversion and neuroticism. According to the obtained results neuroticism does not depend on the degree of extraversion. The aggressiveness index was lower in introverts as compared with both extraverts and persons with middle level of extraversion. The aggressiveness index of extraverts is higher than that of introverts. But difference between aggressiveness index in extraverts and persons with middle level of extraversion was not revealed.

Although the correlation between extraversion degree and aggressiveness index was not found, moderated negative statistically significant correlation between the above mentioned parameters was revealed in men with middle level of extraversion. It should be noted that in introverts positive correlation between extraversion degree and aggressiveness index was found. But it is statistically insignificant.

The aggressiveness index depended on the neuroticism level. It was lower in persons with low level of neuroticism as compared with persons with both middle and high levels of neuroticism. The aggressiveness index of persons with high level of neuroticism is higher than that of persons with middle level of neuroticism.

Middle positive statistically significant correlation was observed between aggressiveness index and level of neuroticism total group of men. It is very interesting, that in introverts and men with middle level of extraversion the correlation between aggressiveness index and level of neuroticism is absent, but it exists in extraverts.

So the aggressiveness index depends on the degree of extraversion and level of neuroticism. The aggressiveness index is the highest in men with high level of neuroticism. In extraverts the aggressiveness index positively correlates with neuroticism level and in men with middle level of extraversion the aggressiveness index negatively correlates with extraversion degree.

Key words: aggressiveness, neuroticism, extraversion, men.

Work was carried out within research topic of Kharkiv National Medical University "Research of general tendencies of pathologic processes and elaboration of their correction methods" (state registration number 0103U0004546).

Introduction. Aggression is significant problem of modern society. Every year more than 700.000 people worldwide die because of assault [1]. Two main forms of human excessive aggression are described: impulsive and controlled [2]. The first form is seen in patient with depression and is characterized by high emotional reactions and autonomic responses. The second type is revealed in patients with personality disorders and may be found in individuals without emotional or social deficits. It is characterized by low emotional and autonomic responses [3]. We believe that the genetically determined features of neurohumoral status provide the predisposition of organism to impulsive or controlled aggression in humans (to spontaneous and adaptive aggression in animals). In the experiments on animals (submissive and dominant rats) we revealed the dependence of male behavior type on blood plasma testosterone level [4], tight negative correlation between testosterone level and hypothalamic pituitary adrenal axis

hormones [5], the imbalance between monoamines (noradrenaline, serotonin, dopamine) in frontal cortex, hippocampus, cerebellum [5, 6]. Submissive rats can serve as experimental model of depression. Dominant rats demonstrate adaptive aggression.

Incentives and conditions that trigger and provoke manifestations of aggressive and depressive behavior in humans and animals may be different and species specific [3]. At the same time, the neurobiological mechanisms of development are shared [7]. Before the study of neuro hormonal features in people predisposed to different types of aggression, we decided to investigate the relationship between temperamental characteristics and aggressiveness.

Objective of work is the investigation of interrelation between extraversion level, neuroticism and aggressiveness in men.

Materials and methods. The study involved 100 young men aged 18 to 22 years. They were asked to answer Buss-Durkee Hostility Inventory and Eysenck Personality Inventory. Buss-Durkee Hostility Inventory is one of the most popular foreign psychology techniques to study aggression. Eysenck Personality Inventory is aimed at identifying extraversion-introversion and emotional stability-instability assessments (neuroticism). The level of extraversion and neuroticism was assessed in points. The aggressiveness index was estimated in a percentage of the maximum level. Eysenck Personality Inventory provides to estimate the sincerity of answers. If the answers have not been sincere, they were not taken into account.

Statistical analysis of the results was carried out by methods of nonparametric statistics using the package "Statistica 6.0". Nonparametric analogues of dispersion analysis Kruskal-Wallis and median tests – were used to reveal the dependence of parameters on group. Mann-Whitney test and correlation analysis according to Spearman were used to compare groups in pairs.

Results and discussion. The aggressiveness index was found to depend on both extraversion and neuroticism ($H=6.826, p=0.033$; $H=15.27, p=0.0005$, respectively). According to the obtained results neuroticism does not depend on the degree of extraversion (**Figure 1**).

The aggressiveness index was lower in introverts as compared with both extraverts ($p=0.0096$) and persons with middle level of extraversion ($p=0.033$) (**Figure 2**). The aggressiveness index of extraverts is higher than that of introverts. But difference between aggressiveness index in extraverts and persons with middle level of extraversion was not revealed.

Although the correlation between extraversion degree and aggressiveness index was not found in total group of men, moderated negative statistically significant correlation between the above mentioned parameters was revealed in men with middle level of extraversion (Spearman $R=-0.4283, p=0.029028$). It should be noted that in introverts positive correlation between extraversion degree and aggressiveness index was found ($R=0.67$). But it is statistically insignificant ($p=0.14$).

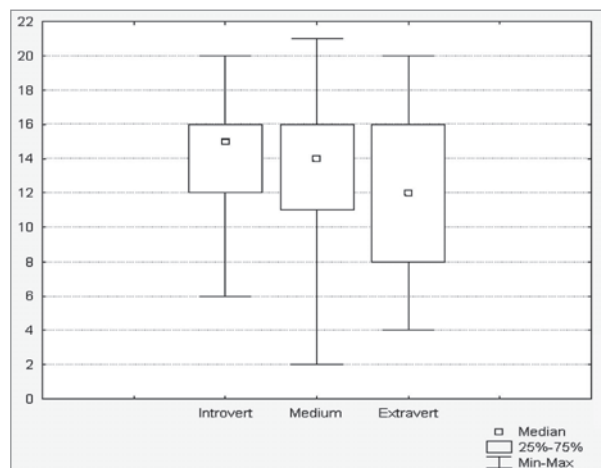


Figure 1. Neuroticism level in men with different degree of extraversion (Me [25%; 75%], min and max).

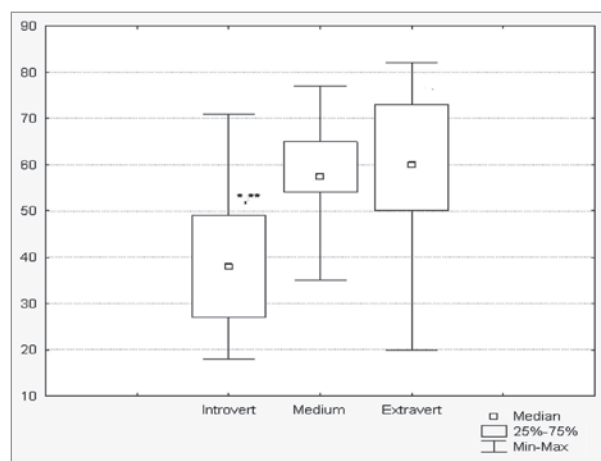


Figure 2. The aggressiveness index in men with different degree of extraversion (Me [25%; 75%], min and max). * $-p < 0.05$ versus medium (persons with middle degree of extraversion); ** $-p < 0.05$ versus extraverts.

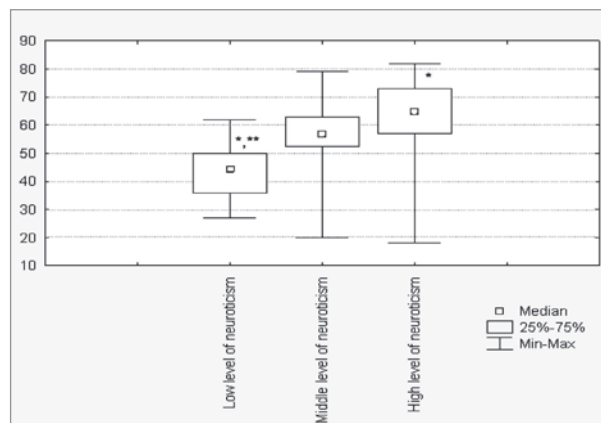


Figure 3. The aggressiveness index in men with different degree of neuroticism (Me [25%; 75%], min and max). * $-p < 0.05$ versus persons with middle level of neuroticism; ** $-p < 0.05$ versus persons with high level of neuroticism.

The aggressiveness index depended on the neuroticism level. It was lower in persons with low level of neuroticism as compared with persons with both middle ($p=0.002883$) and high ($p=0.0042$) levels of neuroticism. The aggressiveness index of persons with high level of neuroticism is higher than that of persons with middle level of neuroticism (**Figure 3**).

Middle positive statistically significant correlation was observed between aggressiveness index and level of neuroticism ($R=0.419, p=0.0063$) total group of men. It is very interesting, that in introverts and men with middle level of extraversion the correlation between aggressiveness index and level of neuroticism

is absent, but it exists in extraverts ($R=0.62387, p=0.000186$).

Conclusions.

1. The aggressiveness index depends on the degree of extraversion and level of neuroticism.

2. The aggressiveness index is the highest in men with high level of neuroticism.

3. In extraverts the aggressiveness index positively correlates with neuroticism level and in men with middle level of extraversion the aggressiveness index negatively correlates with extraversion degree.

Prospects. The research of testosterone, 17β -estradiol and cortisol levels to estimate their interrelation with aggressiveness index in men.

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УДК 159.923:316.62-055.1-053.81(049.5)

ВЗАЄМОЗВ'ЯЗОК МІЖ РІВНЕМ ЕКСТРАВЕРСІЇ, НЕЙРОТИЗМА ТА ІНДЕКСОМ АГРЕСІЇ

Попова Л. Д., Васильєва І. М., Наконечна О. А.

Резюме. У молодих чоловіків було досліджено взаємозв'язок між ступенем екстраверсії, рівнем нейротизму та індексом агресивності. Було виявлено, що індекс агресивності залежить як від ступеня екстраверсії, так і від рівня нейротизму, проте залежності між екстраверсією та нейротизмом не виявлено. Найвищий індекс агресивності був характерний для чоловіків з високим рівнем нейротизму. У екстравертів індекс агресивності позитивно корелював з рівнем нейротизму, а у чоловіків з середнім рівнем екстраверсії індекс агресивності негативно корелював зі ступенем екстраверсії.

Ключові слова: агресивність, нейротизм, екстраверсія, чоловіки.

УДК 159.923:316.62-055.1-053.81(049.5)

ВЗАИМОСВЯЗЬ МЕЖДУ УРОВНЕМ ЭКСТРАВЕРСИИ, НЕЙРОТИЗМОМ И ИНДЕКСОМ АГРЕССИВНОСТИ

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Резюме. У молодых людей была исследована взаимосвязь между степенью экстраверсии, уровнем нейротизма и индексом агрессивности. Было обнаружено, что индекс агрессивности зависит как от степени экстраверсии, так и уровня нейротизма, хотя зависимости между экстраверсией и нейротизмом не выявлено. Наиболее высокий индекс агрессивности характерен для мужчин с высоким уровнем нейротизма. У экстравертов индекс агрессивности положительно коррелировал с уровнем нейротизма, а у мужчин со средним уровнем экстраверсии индекс агрессивности отрицательно коррелировал со степенью экстраверсии.

Ключевые слова: агрессивность, нейротизм, экстраверсия, мужчины.

Стаття надійшла 27.11.2015 р.

Рекомендована до друку на засіданні редакційної колегії після рецензування