THE METHODOLOGICAL PROBLEMS OF CORRELATION (OR COMPLIANCE) AND QUALITY METRIC ASSESSMENTS IN NEUROPSYCHOLOGY

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This article highlights the strengths and weaknesses of to two research directions neuropsychology of domestic and foreign, as well as identifying possible areas of integration. One of the most acute problems is the development of experimental psychological methods to determine the quantitative and expressed characteristics of the psychic phenomena by flexibly combining qualitative and quantitative approaches, with a view to putting into practice foreign neuroscience principles and standards of evidence. An analysis of contemporary publications on neuropsychological diagnosis reveals the need to consider the standardization of neuropsychological research in the context of current approaches, requirements, and psychodiagnostic criteria. In the domestic neuropsychological literature, these issues are need attention: standardized procedures for presenting stimuli are not, as a rule, described; basic psychometric assessment of the results of the tests is lacking; no investigation of their clinical and psychometric validity is carried out. An analysis was made of the nature of the psychometric approach in foreign child neuropsychology, which relies on mathematical procedures of processing qualitative (ordinal) data converted into quantitative indicators. We examined separately the mathematical software for clinical trials (based on the principles of «evidence-based medicine« which relies on the «abnormal» nature of the distribution of clinical phenomena.

Keywords: neuropsychological diagnostics, psychometric approach, norm, qualitative and quantitative assessment of results.

The modern neuropsychology have two different ways of development are native (Soviet or Russian) and foreign which traditional for USA and Great Britain.

Reaching great success in the work out of quantitative methods for researching the effects of brain lesions the American neuropsychology doesn't rely on any general concept (system) of the brain functioning, a common neuropsychological theory that explain the principles of the formation and development of the brain as a whole. The main methodological approach to the study of patients with local brain lesions is the use of standardized quantitative methods of estimate single functions (Astaeva, Berebin, 2008; Wasserman, L.I., & Shchelkova O.J. 2004; Groth-Marnat, 2003; Haladyna, Downing, 2006; Joy, 2001; Rabin, 2005). In the most general form it should be assumed that the purpose of research in foreign neuropsychology is the identification and description of syndromes in terms of quantitative data. All neuropsychological methods are created according to psychometric approach that includes standardized procedures of examination and processing of the data, the presence of age and socio-cultural norms. This approach makes possible ability to obtain data on the test, compared with an average rate of sample. In addition all these methods used must meet all criteria psychometrics (at least, should have an assessment of their representativeness, reliability and validity). The main disadvantages of these methods are diagnostic problems in identifying the structure and mechanisms of disorders, development of adequate individualized strategies for intervention and correction (Glozman, 1999).

Native neuropsychology had been developing in a different direction. Ideas about the structure of the system of higher mental functions according to which every mental function is composed of many parts of a complex functional system presumes that a damage of the same function is manifestation in different ways depending on the lesion (pathology) a particular part (factor) in the structure of a complex functional system. Therefore the main problems for neuropsychological researches in Russia are to define the qualitative specificity of damages but not just a statement of fact disorder of a function or its degree.

Generally should be assumed that neuropsychological research realized according to all the canons of national neuropsychology delivers

quality features intact and disturbed mental functions.

The methodological basis of this direction of neuropsychological diagnosis is clinical (expert) method which is more effective towards the phenomena are poorly amenable to objectification as well as phenomena are highly variable in the study.

Also this kind of psychodiagnostic research is a reliable means of individual diagnosis (Bodalev, Stolin, 2002) reflecting the individual psychological characteristics of the subjects but not their correlation with any statistical indicators. As a result, this approach is not based on psychometric foundations of psychodiagnostics in their literal sense (eg for mathematical-statistical study of reliability, validity and techniques, especially in the evaluation of *z*-transformed distributions of the results). The methods based on this approach allows to reveal the structure and mechanisms of damages but do not provide statistically reasonable evidence of individual psychological differences between subjects from other people especially from the subjects' normal group. Solution of this problem is one of the cornerstones of medical psychodiagnostics problems.

Modern medical psychodiagnostics based on several classifications of research methods (Wasserman, L. I., & Shchelkova O. J., 2004). Among them, the typological classification of methods and techniques (nomothetic, measuring or ideographic, descriptive), classification based on the underlying principles of the methods and techniques (standardized, quantitative or non-standardized, qualitative), classification of methodological approaches (test and measurement or non-testly qualitative methods and techniques). Obviously, these classifications are created by fundamentally grounds different from each other. Therefore, the apparent identity, identity or synonymy of some of these classifications contained in the definitions of the semantics, however, is different. Thus, the term «measurement» is clearly distinct values in the system «nomothetic» and «test». In the first case, «measuring – nomothetic» can be seen in the context of the diagnosis of psychological phenomena as a measure of the severity of the subject's expressions of certain general laws (from Lat. Nomos – law) in terms of various measurement scales. In this case the identified phenomena may represent not only the severity of regular general features, but also to characterize the situation-specific features of the reaction (response) of the participants, which allows us to characterize the «measuring» as assessment. In the second case, «measurement – test» is regarded as committing the behavioral responses of subjects to test tasks that require finding the right answers. In this case, the «measuring» has an obvious objective characteristic (the quantity of correctly performed test tasks) note that in foreign psychodiagnostics the term is «psychological assessment» is almost completely replaced the term «testing» and used in the study of personality in relation to difficulties emerging in her life through the collection and integration of data from predominantly clinical (expert) methods. Obviously the term «test» in this case rightly apply only to procedures (or their «complex») established by the type tests of achievement (ie, containing the job with the only answer). Therefore the main characteristic of the semantic term «test» (and, as a consequence, the characteristic «measurement – test») in this case is the «objectivity», and the basic semantic feature «measurement – nomothetic» – «psychological assessment».

In a similar vein should be seen interpretation's features of the term «qualitativeness – non-testly» and «qualitativeness – non-standardized». In accordance with described arguments «qualitativeness – non-testly» reveals characteristic of «interpretiveness» as psychodiagnostic research data is interpreted in the verbal descriptions forms (qualitative characteristics) of the subjects of the survey by questionnaire, the scale techniques, and other projective techniques («non-test» in the system described arguments). In the second case «qualitativeness – non-standardized» determined by the content of personal experience expert who allow to provide data of studying in a unformalized description of the results of the psychological «measurement» in the system of quality (nominative) scale that did not based on the norms of procedures or sample. This is consistent with the criteria of the expert (clinical) method.

Therefore in this case, the main characteristic of the term semantic «non-test» (consequently the characteristic of «qualitativeness – non-test») is the «interpretiveness» and basic semantic characteristic of «qualitativeness – non-standartized» – «expert».

However this analysis suggests the desirability of maintaining a common terminology in the above classification system of psychodiagnostic methods in the native psychodiagnostics at least.

Thus, the diversity of psychodiagnostic methods and techniques can be distributed in a multidimensional space formed with the poles of the bipolar axes (factors), «nomothetic (assesment) – ideography (narrative)», «standartizing (quantitative, psychometric) – non-standartizing (non-psychometric)» and «test (objective) – non-test (subjectivity)». The legitimacy of this opinion is based the examples of the use of such a method in psychodiagnostics, in particular when considering the results of a survey on how Rorschach interpretive schemes formed axis-approach «nomothetic – idiographic» and «informative – perceptive» (the terminology and transcription of Burlatshuk L.).

In fact, the whole set of psychodiagnostic methods distributed in three dimensions of classification formed these classification vectors. Moreover, the three-dimensional model does not preclude consideration of the characteristics of psychodiagnostic techniques in spaces (planes, axes) formed as a secondary metric. For example, the characteristics of the «measuring» and «qualitative» methods and techniques in this classification system are in the same plane formed by the pole vectors «nomothetic» and a «test» (in the first case), and «non-standartized» and «non-test» in another. Therefore they can be considered as «secondary vectors» of orthogonally oriented space formed by the three axes of independent classifications. These «secondary vectors» organize the mutual orientation of the poles «nomothetic» and a «test» in the first, and «non-standartized», «non-test» in the second. At the same it seems clear, and the bipolar nature of the vectors «measuring» and «qualitativeness». Similar secondary bipolar factors are interpreted primarily in the relation with character of the assessment results (factors «measuring (assessed or objective) character of the result – a subjective descriptive results» and «quantification assessment – qualitative assessment of the results», or factors «measurement – descriptive» and «quantitative – quality»). These features methods and techniques used in foreign neuropsychology can characterize it as predominantly nomothetic, standardized, test, that is, having at least one common characteristic in a multidimensional system we are considering – the «measuring». In turn, the Russian classic neuropsychological methods and techniques (mainly ideographic, non-standardized, non-test) having at least one common characteristic – «quality». Actually it is about the presence of two significantly differing spaces in a multidimensional space qualification of psychological diagnosis (areas considered by us in the three-dimensional system formed by the axes and planes classifications) – «space qualitative analysis of the results of psychodiagnostic research» and «space measurement». This conclusion may seem somewhat trivial, but in the available literature on the theory of psychodiagnostics have not seen similar methodological studies qualification methods and assessments of the study results.

Herewith each method (depending on the metric characteristics of the system of primary and secondary factors of classification methods psychodiagnostics) can be represented as a single variably oriented vector in the corresponding three-dimensional space – «space measuring» or «space of qualitative analysis». The proposed scheme allows reasonably determine the location of psychodiagnostic methods (including procedures of clinical neuropsychological psychodiagnostics) in the existing classification schemes.

Problem of correlation and convergence of national and international systems of neuropsychological diagnostics requires separate consideration. Opposed marked their localization in these systems described in this article requires the definition of approaches to the problem of increasing psychometric capacity of techniques used in native neuropsychological diagnostics. In the graphical representation this problem is demonstrated by the displacement of vector techniques to the poles of the primary vectors «standardized», «nomothetic», «test». Introduction of secondary vectors several changes orientation for solution this problem – to rotate the vector neuropsychological methods in the plane formed by secondary vectors «measuring (assessed or objective) nature of the assessment», and «quantitative assessment of the results». It is this content owned this plane vectors can define it as a «plane of psychometrics». Changing the direction of the vector characteristics of the considered methods in the graphics system takes place in the plane of psychometrics and aims eventually to increase psychometric capacity of techniques. It is obvious

the displacement to the vector quantitative associated with the increased of objectivity (within the meaning of objectivity inherent in achievement tests) and not assessment the results of neuropsychological diagnostics.

However, given their location in opposite areas of three-dimensional space, the fundamental differences are in their underlying methodologies and priori opposed axes forming the space methods and techniques of neuropsychological psychodiagnostics considered by us, it can be assumed that such a merger is fundamentally impossible. In other words the current situation suggests the two approaches should be only one. Subject of integration opposing approaches psychodiagnostics is one of the issues discussed.

A more rational and justified is a solution combining these two approaches. The need to maintain a combination of both approaches (is based on a standardized, normalized techniques based on a qualitative analysis of the results of individual-based neuropsychological 'reasoning research) stated in almost all russian publications on modern neuropsychology and neuropsychological diagnostic (Tsvetkova L.S.; Mikadze Y.V.; Wasserman, L. I. et al.; Glozman J.M.). In considering system the combination of these approaches is the development of techniques combined with consistently amplified by the measuring quantitative psychometric potential. Graphic equivalent of this complex of techniques can be considered a set of vectors in the plane psychometrics, consistently filling space continuum from the qualitative analysis of the results of the study to psychodiagnostic testing space. The theoretical foundation of such techniques may be presented an extensive list from qualitative approach to assessment relying on the subjectivity psychologist, the psychologists' subjectivity to quantify the research data obtained from the application of measurement procedures.

The urgency of the psychometric approach in neuropsychological diagnosis is obvious. The main problem is the choice of specific tools of psychometrics like neuropsychological psychodiagnostic. However, it should be emphasized the importance of formation a modern understanding and filling qualitative analysis in the neuropsychology. At the same time remains a danger risk to select one of the poles of a dichotomous division of researchers who «measures without thinking» and those who «think without measuring» (Andreeva, 1996). It is obvious that can not solve one of the main tasks of neuropsychological diagnostics without the involvement of lacking mechanistic «arithmetic way» is the analysis of neuropsychological tasks factor in the classical sense. This task is performed by the algorithm sufficiently rigorous action researcher, his or her adequate transition from fixing the availability of neuropsychological symptoms and syndromes to establish neuropsychological factor as a kind of abstract construct that reflects the features of physiological and mental functioning of certain areas of the brain in health and disease. In terms of the psychometric approach is required to first provide data formalization of neuropsychological diagnostics – from formalize the results of each completed neuropsychological tests to formalize representation of neuropsychological factors. Second, it requires formalization and use of algorithms forming diagnostic output (for example, the results of the study of formal qualifications in the evaluation of the primary-secondary symptoms' formed, in the system of their cause and effect relate, in the system of the assessments' character detected phenomena as either focal cerebral, assess their lateralization and interhemispheric interaction, assessment of neuropsychological symptoms and syndromes in terms of «security – irregularities» in the structure of mental function. Third, we need a formal assessment of the contribution (weight) of each symptom-qualified formalized in the final presentation of neuropsychological syndrome. Fourthly, we need a formal pattern of neuropsychological factors in general and release of its «core» and related anatomical and functional and mental phenomena, on the one hand, and the formalization of these neuropsychological studies, on the other.

The above arguments are based on the formalization of psychodiagnostic data as a method of quantitative and measuring results are displayed neuropsychological diagnostics. In connection with the above there is a problem of choice of methods, forms and techniques of formalizing materials neuropsychological diagnostics. The above four course of software development psychometric neuropsychological studies clearly, in our opinion, determine the particular qualifications of the research results (including and especially their qualitative and quantitative mapping), and the details of a for-

malized (including measuring and mathematical-statistical) display.

In line with the first objective of formalizing the results of neuropsychological tests, followed by «translation» of the data in the content categories of neuropsychological symptoms, syndromes and factors – native neuropsychology developed some system of observed quality of pathology in the form of certain data point rating system (Astaeva, Berebin, 2008, Wasserman, 1997; Glozman, 1999; Mikadze, 2002). These a point system based on the methods of quantification of the results of neuropsychological diagnostics. Note that, in our opinion, the term «quantification» (from the latin. quantitas – number) did not accurately reflect the essence of the method is the use of this transformation of qualitative data (expressed in terms of nominative scale of the results used non-standardized methods of neuropsychological diagnostics). Assigning points to a survey results depending on the measure of the severity of the observed damages is not actually «quantification» results («splitting apart»), and their representation in the ordinary form – psychodiagnostic investigation results are reflected in the quality as ordered by their nature estimates («low ...», «... moderately» or «severely impaired»), followed by assigning points (rank values disorders). Therefore a more accurate, in our opinion, such an option to handle the quantitative conversion of qualitative data psychodiagnostic study is «ordinations».

In psychometric terms basic problem here is the need to resolve the so-called «uniqueness problem for the theory of measurement» of ensuring the uniqueness of assigning numerical values of the phenomena in line with empirically established relations in every manifestation of the phenomenon and the relationship between the phenomena in general (Suppes, Zines, 1967), and the value is given a score depending on the quality characteristics of the phenomenon under study – the severity of the damage. It should be based on the opinion of D. Campbell (quoted by Suppes, Zines, 1967, p. 57) that for any qualitative properties do not exist empirical operations such as arithmetic operations of addition, and the fact that this kind of quantitative results can be as little mistakes, both as qualitative (Campbell, 1996).

Thus, scoring qualitative data is mathematically non-rigorous attempt a measurement of derivatives by increasing the power of the scale (Campbell, 1996). In this case, the developers of the above scoring systems is recognized, externally apparent equal intervals scale recording the results of psychodiagnostic study presented scores 0, 1, 2, 3 do not really mean equal «growth» pathology (Bizyuk, 2002). As a consequence, the use of parametric methods of processing the results of the qualitative data display is very annoying from a mathematical point of view. In other words, data means of such systems make highly questionable from a mathematical point of view even the use of arithmetic methods are used to scale capacity not higher rank (ordinal, ordinary). Moreover the principles adopted in psychometrics (in particular, the provision in the first place and received a reliable method with the help of results in accordance with the rule «*validity* ≤ *reliability*») require limited in this case, the methods adopted for processing the results of measurements on the rank scale. The solution to this problem can be obtained in the plane rather than psychometric procedures, and on the basis of using the tools developed in evidence-based medicine.

With the development of evidence-based methodology of one of the leading problems in clinical practice is the search for and selection of the best ways to identify diseases or conditions are present in the two groups of patients: symptomatic (actual diagnosis) and asymptomatic (screening examination). Development of methods for the accurate diagnosis is primarily prognostic value in making informed decisions for clinical intervention are required to distinguish between certain sets of features (eg, clinical assessment unsteadiness when walking) and a history of symptoms (for example, information about the patient verbalized that he has a weakness for walking), all of which may indicate the presence of a disease or disorder (McKibbon, Wilczynski, 2009).

At present, evidence-based medicine in preference to the use of diagnostic and screening tests, the new generation, less risky and less invasive, less expensive and simpler to use, more convenient for patients and quickly gave more accurate results, the interpretation of which more than clear.

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О МЕТОДОЛОГИЧЕСКИХ ПРОБЛЕМАХ СООТНЕСЕНИЯ (ЛИБО СООТВЕТСТВИЯ) КАЧЕСТВЕННОЙ И МЕТРИЧЕСКОЙ ОЦЕНОК В НЕЙРОПСИХОЛОГИИ

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Развитие современной психологической диагностики, использующейся для решения клинических задач, требует, в частности, анализа и систематизации сложившихся в отечественной и зарубежной нейропсихологической диагностике тенденций и подходов, с выделением сильных и слабых сторон каждой из них, а также определением возможных направлений их интеграции. В связи с этим к числу наиболее острых проблем относятся методологические вопросы создания экспериментально-психологических методов, позволяющих получать количественно выраженные психологические характеристики нарушений, гибко сочетающих в себе качественный и количественные подходы. Одним из направлений решения такой проблемы может являться внедрение в практику принятых в зарубежной нейропсихологии принципов стандартизации и доказательности. Анализ современных публикаций по нейропсихологической диагностике позволяет сделать вывод о необходимости обеспечения стандартизации нейропсихологического исследования на основе современных подходов, требований и критериев психодиагностики. Однако в отечественной нейропсихологической диагностике эти проблемы решаются недостаточно: не описываются стандартизованные процедуры предъявления стимулов; как правило, психометрические обоснования оценки результатов выполнения проб не разрабатываются; при описании психодиагностических методик не приводятся данные исследования их клинической и психометрической валидности. В то же время для зарубежной нейропсихологии характерен психометрический подход, опирающийся на математические процедуры обработки качественных (порядковых) данных, преобразованных в количественные показатели. Отдельную проблему нейропсихологической диагностики в составе складывающегося в России современного учения о медицинской психодиагностике составляет математическое обеспечение клинических исследований (т. н. принципы «доказательной медицины»), опирающееся на положение о «ненормальном» характере распределения клинических феноменов.

Ключевые слова: нейропсихологическая диагностика, психометрический подход, норма, качественно-количественной оценки результатов.

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