

Typology of temperaments "Priority": sustainable development of the organization due to the increase in the personnel work efficiency

Alexander Kosyakov¹ and Alexander Ishkov^{2*}

¹ Soyuz Limited Liability Company, Kripopotkina str., 2/6, Voronezh, 394030, Russia

² Moscow State University of Civil Engineering, Yaroslavskoe shosse, 26, Moscow, 129337, Russia

Abstract. The paper is devoted to the matters of application of the temperaments typologies in the personnel management of organization. The existing typologies use the special properties of nervous system, which are just the secondary signs of the characteristics of nervous system, really defining the temperament type, as the bases (signs) for allocation of temperament types. The purpose of this research is to develop the typology of temperaments, using structural interrelations among the elements of the nervous system, which define the properties of the system from the position of the system theory, for allocation of the temperament types. As the result the authors created the typology of temperaments according to the priority in dichotomies of the nervous system components (typology of temperaments "Priority") allowing to allocate 4 classical types of temperament and 2 optional expanded types of temperament (including 8 types) as well and also 16 complete types of temperament. The authors' belongs to the area of personnel management, psychology of individual distinctions and neurophysiology. The results obtained by the authors can be used in professional selection, professional orientation, personnel selection, team building, managerial decision-making on personnel, psychological counseling, etc. thus contributing to the improvement of personnel management methods of the organization.

1 Introduction

Effective management of the personnel of the organization requires a reliable forecast of individual differences in reactions of the people, involved in the production processes. The typological approach, which allows to divide people into several characteristic groups according to their temperament, can provide the maximum effect.

Theories of temperament were devoted by Hippocrates and Galen [1-3], Kant [4], Heymans [5], G. Yu. Ayzenk [6], R.B. Kettel [7], E. Krechmer's works [8], U. Sheldon [9], Ya. Strelyau [10], I.P. Pavlova [11], B. M. Teplov, V.D. Nebylitsyna [12], V.M. Rusalova [13, 14], I. Trofimova, T. Robbins [15-17]. The listed researchers chose the most various signs for the emphasizing of temperament types, but after the well-known experiments of I.P. Pavlov conducted at the beginning of the XX century, it was recognized that the temperament

* Corresponding author: aishkov@gmail.com

type is defined by the features of the human nervous organization [18]. Most of modern researchers consider, that the temperament is defined by a certain set of properties of nervous system, in particular: by force of nervous processes, steadiness of processes of excitement and braking, mobility of nervous processes, speed of nervous processes, sensitivity of nervous system, excitability of attention, emotional excitability, as well as by the power of emotions, reactivity of involuntary movements, uneasiness, resistance, plasticity-rigidity, activity of strong-willed purposeful activity and so forth. Such quantity of the used properties of nervous system and, respectively, quantity of the offered options of emphasizing of temperament types, proves that the properties of nervous system are only secondary signs of its features, which really define the type of temperament.

At the same time, there are a number of works, which authors use not private properties of the nervous system, but its structure (the internal organization of a system) as the bases for the emphasizing of temperament types. For example, the relation between the cerebral hemispheres of the human [19] or relation between the sympathetic and parasympathetic nervous subsystems [20] can be considered. But it should be noted that the known techniques as the bases for emphasizing of temperament types also use the private properties of the nervous system, not only its structure. Such mixture of the bases (signs) of various level does not allow to achieve the necessary result, i. e. to move to the level of characteristics, which are defining the temperament type unambiguously.

Thus, nowadays the problem of creation of typology, in which the temperament type is defined on the basis of the structure of the nervous system, is relevant. As only such a typology of temperament will provide the exact assessment of mental features of the candidate for employees, it will allow to make more exact decision concerning its position in the organization, to choose constructive methods of interaction with a person, and, finally, it will provide the effective personnel management in the organization.

The authors of the paper consider that the structural interrelations among the elements of mentality are the very characteristics which define the temperament type as the structure reflects the most material aspects among the elements and their groups (sets, components, subsystems) and defines the properties of systems of any nature" [21]. Considering that, the authors developed the original typology, in which the temperament type is defined on the basis of the analysis of relationship among the elements of the nervous system, i.e. on the basis of the structure of the nervous system.

2 Materials and Methods

This research is aimed at the development and justification of the temperaments typology, in which the temperament type is defined on the basis of the characteristics of the nervous system of the more general order, than the well-known typologies, based on the secondary signs of the structure of the nervous system now.

During the first stage of the investigation the search of publications in the research subject was carried out. It was followed by the analysis of the found scientific documents. On the basis of this analysis the conclusion was drawn, that nowadays there is a set of options of the temperaments typology, in which various private properties of the nervous system form the bases for emphasizing of types.

Systems analysis of the received results led the authors to the conclusion, that it is necessary to use not the private properties of the nervous system, which are only secondary signs, but structural interrelations among the elements of the nervous system as the bases (signs) for emphasizing of temperament types. Relying on the results of the system analysis the temperaments typology according to the priority in dichotomies of the components of the nervous system, in which the temperament type is defined with the use of the structure of the nervous system, was developed.

3 Results

The nervous system of a person is intended for the control and regulation of functions of the organism. In fact, that is the information system, consisting of two control loops: external and internal. The external contour represents the somatic nervous system, and internal one represents the visceral (vegetative system). Each contour is divided into two parts: afferent (perceiving, entrance) and efferent (executive, output). There is an accepted terminology for the subsystems of the somatic system: afferent one is called touch (sensory), and efferent is called motor. The subsystems of the visceral system have no established names yet. As a first approximation, the authors suggest calling the afferent visceral subsystem intuitive, as it perceives internal corporal signals, which not always manage to be compared with the external phenomena quickly. It is offered to call the efferent visceral subsystem temper-and-tone, as it influences the person through mobilization of internal resources of the organism due to the regulation of the tone of internals.

Figure 1 presents the scheme for the defining the temperament type according to the priority of nervous subsystems. The somatic nervous system is to the left of a vertical axis the external control loop, and the internal control loop (visceral nervous system) is on the right. The afferent part of nervous system is under the horizontal axis, and the efferent part of the nervous system is over the horizontal axis. Four subsystems (touch, motor, intuitive and temper-tone) are in their quadrants, connected with the central nervous system, which is placed in the center of the scheme. These communications are shown in the form of four arrows, showing the direction of movement of signals (impulses).

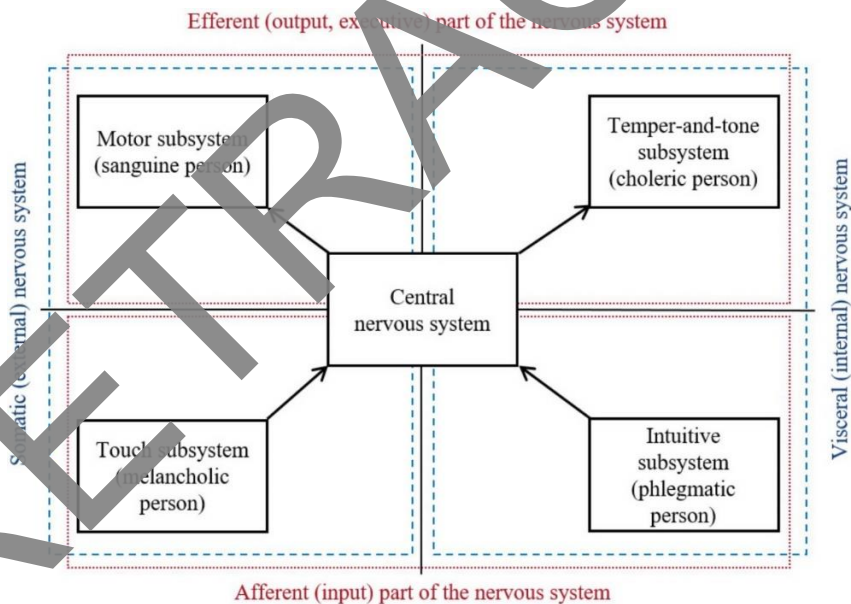


Fig. 1. Scheme for defining the temperament type according to the priority of nervous subsystems

The analysis of specifics of the specified subsystems work allows to connect the features of their functioning with the manifestations of classical (Hippocrates's) temperament types:

- The afferent somatic (touch) subsystem provides collecting and processing of touch information from external receptors of the organism. Such work demands the thin, directed to ideal perception of external factors control of mentality, it is associated with manifestations of melancholic temperament.

- The efferent somatic (motor) subsystem provides the body movements control, generating and broadcasting executive (motor) information to muscles. Such work of the nervous system is effectively carried out at most liberated condition of mentality and it is associated with sanguine temperament.

- The afferent visceral (intuitive) subsystem provides data collection and processing about the homeostatic status of the organism from internal receptors. This work demands mental concentration, impartiality, emotional block and it is associated with manifestations of phlegmatic temperament.

- The efferent visceral (temper-and-tone) subsystem provides the mobilization of internal resources of the organism, generating and broadcasting the activating executive information to internals. Such work of mentality is implemented through excitement and it is associated with choleric temperament.

Psychological practice proves, that there are no pure monotemperaments, each person is the carrier of all the temperaments, just the degree and frequency of their manifestation by the specific individual differs. That is well visible from the offered model, where the type of temperament is defined as the priority functioning of one of four nervous subsystems. All the subsystems are used by each person. But the carriers of various temperament types differ with the specialization in the use of the competing nervous subsystems. Analyzing the provided model of identification of temperament types according to the priority in dichotomies of the components of the nervous system (typology of temperaments "Priority"), the authors determined the following consistent patterns:

1. The nervous subsystems, belonging to the same nervous system (somatic or visceral), form dichotomizing pairs, competing among themselves:

- touch subsystem and motor subsystem (somatic system);
- intuitive subsystem and temper-and-tone subsystem (visceral system).

2. One subsystem in each of above specified dichotomizing pairs is priority, e.i. it dominates over another, determining the level of its activity. That ensures the approved, frictionless functioning of both subsystems and the corresponding nervous system in general.

3. Somatic and visceral nervous systems form the competing dichotomizing pair in which one of systems is priority that forming hierarchy of these systems, allows to ensure their approved, frictionless functioning.

4. The priority subsystem of priority nervous system (the main subsystem) is the first to react to all the signals, providing reflex automatic response of the person to the arriving challenges. Therefore, the main subsystem is constantly improved and, being the most demanded, defines basic (classical) of the temperament type of the person:

- If the main subsystem is touch, then the person will have melancholic temperament type.
- If the main subsystem is motor, then the person will have sanguine temperament type.
- If the main subsystem is intuitive, then the person will have phlegmatic temperament type.
- If the main subsystem is temper-and-tone, then the person will have choleric temperament type.

5. If the main subsystem does not cope, then the priority subsystem of the secondary nervous system (auxiliary subsystem) gets into active gear. Activation of the auxiliary subsystem requires commission of mental work. It is associated with the conscious human activity when he or she realizes the thinking process.

Thus, it is possible to note two implemented routinely like temperament for each person: the main and auxiliary which will correspond to functioning of the main and auxiliary nervous subsystems respectively on reflex (automatic) and conscious (adaptation) levels of mental reaction (consciousness). For example, the main touch subsystem with assistance of auxiliary temper-and-tone subsystems are shown in the form of basic melancholic temperament with auxiliary choleric. Others, the suppressed and forced out subsystems

(temperaments) will be shown in special circumstances at the third and fourth levels of reaction (consciousness) which are responsible for motivation and enthusiasm.

Considering the auxiliary subsystem, we receive eight expanded types of temperament (table 1).

Table 1. Expanded types of temperament considering the auxiliary subsystem

##	Expanded temperament type	Main subsystem	Auxiliary subsystem
1	Phlegmatic melancholic	Touch	Intuitive
2	Choleric melancholic	Touch	Temper-and-tone
3	Phlegmatic sanguine person	Motor	Intuitive
4	Choleric sanguine person	Motor	Temper-and-tone
5	Melancholic phlegmatic person	Intuitive	Touch
6	Sanguine phlegmatic person	Intuitive	Motor
7	Melancholic choleric person	Temper-and-tone	Touch
8	Sanguine choleric person	Temper-and-tone	Motor

Other combinations of main and auxiliary subsystems, and, consequently, of temperaments, for example, melancholic sanguine or choleric phlegmatic, are impossible, since they represent a competing dichotomous pair entering into one control circuit of the body: external or internal.

6. The first and second signaling systems form one more competing dichotomizing pair, in which one of the systems is a priority. That allows to ensure their approved, frictionless functioning.

The first signaling system is intended for perception and the analysis of concrete irritants (signals) of the real world influencing any receptors of the organism on the basis of which there is the concrete sensory perception of the world around and at the psychological level is shown as the specification. The second signaling system operates with a word, speaking ("a signal of signals") and, reflecting reality in the symbolical type, allows the person to distract from concrete subjects and the phenomena. Being the basis of the development of abstract and logical thinking the second signaling system at the psychological level is shown as abstraction.

First signal information processing and reactions prevail, as a rule, in case of domination of the right cerebral hemisphere domination, which is in turn connected with functioning of the highest centers of the sympathetic nervous subsystem [22]. The second signaling system prevails, as a rule, in case of domination of the left cerebral hemisphere which is connected with functioning of the parasympathetic nervous subsystem [23].

Respectively, it is possible to speak about the expanded temperament types, considering a priority signaling system (table 2).

Table 2. Expanded types of temperament considering a priority signaling system

##	Expanded temperament type	Main subsystem	Priority signaling system
1	Melancholic, first signal	Touch	first
2	Melancholic, secondary signal	Touch	second
3	Sanguine, first signal	Motor	first
4	Sanguine, secondary signal	Motor	second
5	Phlegmatic, first signal	Intuitive	first
6	Phlegmatic, secondary signal	Intuitive	second
7	Choleric, first signal	Temper-and-tone	first
8	Choleric, secondary signal	Temper-and-tone	second

7. If we consider the priority alarm system connected with the main subsystem besides the main and auxiliary subsystems, then we receive sixteen complete temperament types (table 3).

Table 3. Complete temperament types

##	Complete temperament types	Main subsystem	Priority signaling system	Auxiliary subsystem
1	Melancholic person first signal, phlegmatic	Touch	first	Intuitive
2	Melancholic person secondary signal, phlegmatic	Touch	second	Intuitive
3	Melancholic first signal, choleric	Touch	first	Temper-and-tone
4	Melancholic secondary signal, choleric	Touch	second	Temper-and-tone
5	Sanguine person first signal, phlegmatic	Motor	first	Intuitive
6	Sanguine person secondary signal, phlegmatic	Motor	second	Intuitive
7	Sanguine person first signal, choleric	Motor	first	Temper-and-tone
8	Sanguine person secondary signal, choleric	Motor	second	Temper-and-tone
9	Phlegmatic person first signal, melancholic	Intuitive	first	Touch
10	Phlegmatic person secondary signal, melancholic	Intuitive	second	Touch
11	Phlegmatic person first signal, sanguine	Intuitive	first	Motor
12	Phlegmatic person secondary signal, sanguine	Intuitive	second	Motor
13	Choleric person first signal, melancholic	Temper-and-tone	first	Touch
14	Choleric person secondary signal, melancholic	Temper-and-tone	second	Touch
15	Choleric person first signal, sanguine	Temper-and-tone	first	Motor
16	Choleric person secondary signal, sanguine	Temper-and-tone	second	Motor

8. The auxiliary subsystem is connected with a low priority signaling system. That allows to compensate the signal specialization of the main subsystem (table 4).

Table 4. Complete temperament types with signaling of an auxiliary subsystem

№№	Complete temperament types	Main subsystem	Signaling system of the main subsystem	Auxiliary subsystem	Signaling system of the auxiliary subsystem
1	Melancholic person, first signal, phlegmatic	Touch	first	Intuitive	second
2	Melancholic person, secondary signal, phlegmatic	Touch	second	Intuitive	first
3	Melancholic person, first signal, choleric	Touch	first	Temper-and-tone	second
4	Melancholic person, secondary signal, choleric	Touch	second	Temper-and-tone	first
5	Sanguine person, first signal, phlegmatic	Motor	first	Intuitive	second
6	Sanguine person, secondary signal, phlegmatic	Motor	second	Intuitive	first

7	Sanguine person, first signal, choleric	Motor	first	Temper-and-tone	second
8	Sanguine person, secondary signal, choleric	Motor	second	Temper-and-tone	first
9	Phlegmatic person, first signal, melancholic	Intuitive	first	Touch	second
10	Phlegmatic person, secondary signal, melancholic	Intuitive	second	Touch	first
11	Phlegmatic person, first signal, sanguine	Intuitive	first	Motor	second
12	Phlegmatic person, secondary signal, sanguine	Intuitive	second	Motor	first
13	Choleric person, first signal, melancholic	Temper-and-tone	first	Touch	second
14	Choleric person, secondary signal, melancholic	Temper-and-tone	second	Touch	first
15	Choleric person, first signal, sanguine	Temper-and-tone	first	Motor	second
16	Choleric person, secondary signal, sanguine	Temper-and-tone	second	Motor	first

4 Discussion

Personnel management is the important part of the management process and it is impossible to achieve good results without effective management of the staff of the organization. Typological approach is widely used in personnel management, but at the same time private properties of nervous system, not characteristics of nervous system of more general order (structural interrelations) among the elements of nervous system are used in the existing typology for emphasizing temperament types. And from the position of the theory of systems the structure defines the properties of the system.

As the main objective of the nervous system is preserving of the organism as whole, all its subsystems are interconnected among themselves according to the hierarchical principle. Therefore, the identification of the priority elements of the nervous system from the competing dichotomizing pairs (touch or motor subsystem; intuitive or temper-and-tone subsystem; somatic or visceral system; afferent or efferent part of the nervous system; first or second signal system) allows to establish the structure of the nervous system and hierarchy of its elements, and, therefore, to determine the temperament type according to the model, offered by the authors:

- touch subsystem is the main one for melancholic person;
- motor subsystem is the main one for sanguine person;
- intuitive subsystem is the main one for phlegmatic person;
- temper-and-tone subsystem is the main one for choleric person.

Four classical temperament types can be concretized in the offered model, having revealed an auxiliary subsystem or a priority signaling system. In this case we will receive two options of expanded temperament types (table 5).

Table 5. Two options of expanded temperament types

##	Expanded temperament type, considering an auxiliary subsystem	##	Expanded temperament type considering a priority alarm system
1	Phlegmatic melancholic	1	first signal melancholic
2	Choleric melancholic	2	secondary signal melancholic
3	Phlegmatic sanguine person	3	first signal sanguine person
4	Choleric sanguine person	4	secondary signal sanguine person
5	Melancholic phlegmatic person	5	first signal phlegmatic person
6	Sanguine phlegmatic person	6	secondary signal phlegmatic person
7	Melancholic choleric person	7	first signal choleric person
8	Sanguine choleric person	8	secondary signal choleric person

If we combine the expanded temperament types, then we will receive sixteen complete types of temperament (table 3).

Definition of temperament type according to the offered scheme can be carried out by both the hardware, and blank methods (by the means of questionnaires) aimed at identification of the priority elements of the nervous system from the competing dichotomizing pairs. However, the equipment, necessary for diagnostics, is a little widespread and it is available only in the specialized organizations, and the procedure of hardware diagnostics is expensive and takes rather long time. Therefore, polling techniques are used more often. According to the offered scheme the authors developed the questionnaire for the emphasizing of temperament type "Diagnostics of temperament type according to the priority in dichotomies of the components of the nervous system" [24].

5 Conclusions

The authors of the paper carried out the search of scientific publications in the research subject, which analysis led them to the conclusion that it is necessary to use not private properties of nervous system, and structural interrelations among the elements of the nervous system as the bases (signs) for emphasizing of temperament types. At the same time only the elements of the nervous system which form the competing dichotomizing pairs as in such pairs one of the elements, becoming priority, determines the temperament features of the person matter.

The authors revealed the following competing dichotomizing couples of the elements (components) of the nervous system: touch or motor subsystem; intuitive or temper-and-tone subsystem; somatic or visceral system; afferent or efferent part of the nervous system; the first or second signal system. And then the typology of temperaments "Priority" was developed on the basis of these competing dichotomizing couples of the elements of the nervous system.

Besides the authors formulated the main regularities which are the cornerstone of the offered model and developed the questionnaire for the identification of temperament type of the person on the priority in dichotomies of the components of the nervous system.

The results, received by the authors, can be used for professional selection, professional orientation, selection of personnel, team building, making managerial decisions on personnel, psychological consultation, etc., thus promoting the improvement of personnel management methods of the organization.

References

1. A.N. Zhdan, Psychology history: From antiquity up to now. Psychology. Moscow. (Moscow State University publishing house, 1990)
2. Psychological types. Moscow (University book; Nuclear heating plant, 1998)
3. P.N. Singer, Galen: works on human nature: volume 1, mixtures (de temperamentis). (Cambridge University Press Academ, 2018)
4. I. Kant, (1798) Anthropology from a pragmatic point of view (trans. Mary Gregor). The Hague: Martinus Nijhoff, 1974 (Ak. VII).
5. G. Heymans, (1929) Inleiding tot de speciale psychologie. [Introduction to Differential Psychology, two volumes] Haarlem: De Erven F. Bohn.
6. H.J. Eysenck, Manual of the Maudsley Personality Inventory (London, 1959)
7. R.B. Cattell, *The birth of the Society of Multivariate Experimental Psychology*. Journal of the History of the Behavioral Sciences **26**. 48-57 (1990)
8. E. Krechmer, Structure of a body and character. (Moscow-Saint-Petersburg, Gosizdat, 1924)
9. W.H. Sheldon, The varieties of human physique: An introduction to constitutional psychology (New York: Harper & Brothers, 1940).
10. J. Strelau, A. Angleitner, B.H. Newberry, The Pavlovian Temperament Survey (PTS): an international handbook. Seattle: Hogrefe & Huber Publishers (1999)
11. Physiological doctrine about types of the nervous system and temperaments. Message at the ceremonial meeting of the Russian surgical society of Pirogov devoted to I.M. Sechenov's memory. Bulletin of surgery. Book 35/36. Pp. 1-9 (1928)
12. B.M. Teplov, V.D. Nebylsyn, *Experimental study of properties of the nervous system in man*. Journal of Highest Nervous Activity, **13**: 789-797 (1963)
13. V.M. Rusalov, I.N. Trofimova, Structure of Temperament and Its Measurement (Toronto, Canada: Psychological Services Press. 2007)
14. V. M. Rusalov, Motor and communicative aspects of human temperament: a new questionnaire of the structure of temperament **10**. 817-827 (1989)
15. I. Trofimova, *Frontiers in Psychiatry* **12** (2021) doi: 10.3389/fpsy.2021.641286
16. I.N. Trofimova, T.W. Robbins, *Neuroscience and Biobehavioral Reviews* **64**. 382-402 (2016). doi:10.1016/j.neubiorev.2016.03.008.
17. Trofimova, I., Robbins, T., Sulis, W., Uher, J. (2018) Taxonomies of psychological individual differences: biological perspectives on millennia-long challenges. *Philosophical Transactions of the Royal Society, Biology*. **373** (1744) doi: 10.1098/rstb.2017.0152.
18. A.D. Ishkov, A.V. Kosyakov, *Journal of Economy and entrepreneurship* **16**, 11. 974-977 (2022)
19. A.N. Anuashvili, Objective psychology on the basis of wave model of brain (Moscow, Ekon-Inform, 2008)
20. P.P. Blonsky, Chosen pedagogical and psychological compositions: collection of scientific works. Moscow, Pedagogics, Volume 1. P. 304 (1979)
21. B.V. Papkov, A.L. Kulikov, Theory of systems and systems analysis for electropower engineering specialists: textbook and a practical work for higher education institutions. (Moscow: Yurayt publishing house, 2024)

22. S.G. Alexandrov, Functional asymmetry and interhemispheric interactions of brain: the education guidance for students. (Irkutsk, 2014)
23. Ya.A. Shardakova, I.A. Karpova, E.V. Kadyrova. *Studying of features of attention, working capacity and structurally functional organization of cerebral hemispheres*. International student's scientific bulletin. No. 3 (2017) URL: <https://eduherald.ru/ru/article/view?id=17194> (date of the address: 22.01.2024).
24. A.V. Kosyakov, A.D. Ishkov, Economy and an entrepreneurship **2**. 1043-1046 (2024)

RETRACTED