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Myers-Briggs typology from the perspective of classification of natural specializations

Aleksandr Ishkov[1*]
[1]Moscow State University of Civil Engineering, Moscow, Russian Federation; aishkov@gmail.com (A.I.).

Abstract: The article is devoted to a comparative analysis of the Myers-Briggs Typology (MBTI), based on psychological characteristics of personality, and the classification of natural specializations (CNS), based on neurophysiological features of the nervous system. The purpose of the study is to identify overlaps, differences, and possible ways of integration and development of these two concepts. On the basis of structural analysis, it was found that the dichotomy "extraversion/introversion" of MBTI corresponds to the dichotomy "concrete/abstract" of CNS. The main functions of MBTI ("sensing," "intuition," "thinking," "feeling") correspond with the classical specializations of CNS: Searcher, Analyst, Synthetic, and Realizator, respectively. The correlation of sixteen MBTI types with sixteen integral specializations of the CNS was established, which demonstrates the neurophysiological basis of each MBTI type, opening the way to a more objective diagnosis of the types through the methods of neurophysiology. The system comparison of MBTI and CNS demonstrates their structural similarity at different levels of content - psychological and biological. This allows us to consider the MBTI as a private, psychological level of the broader neurophysiological model of the CNS. MBTI and CNS, despite their different approaches and methodologies, describe the same underlying individual differences in humans.

Keywords: *Afferent, Classification of natural specializations, Efferent, Exterocept, Interocept, MBTI, Myers-Briggs typology, Natural cycle of activity, Telescopic model.*

1. Introduction

Modern approaches to human resource management are increasingly turning to personality typing methods that allow taking into account individual characteristics of employees. Myers-Briggs typology, realized in the form of psychological testing system "Myers-Briggs Type Indicator" (MBTI) Myers, et al. [1] occupies a special place among such methods. The Myers-Briggs typology was developed on the basis of Jung [2] and has been widely used in psychology, management and career guidance. However, despite its popularity, the Myers-Briggs typology is often criticized for insufficient scientific validity. In this context, the search for alternative or complementary typologies (classifications) based on objective criteria becomes relevant. Such concepts include the classification of natural specializations (CNS) based on the neurophysiological features of a person [3].

The relevance of the study is due to the need to rethink traditional psychological typologies through the prism of modern neurophysiological concepts. In the Myers-Briggs typology the allocation of 16 personality types is made on the basis of psychological characteristics of a person through the combination of poles of four dichotomies. And in CNS, also allocating 16 natural specializations by means of four dichotomies, allocation of specializations is made on priority components (subsystems) of nervous system of the person. The comparative analysis of Myers-Briggs typology and CNS opens new opportunities both for creation of complex HR-strategies combining psychological and biological aspects and for development of these concepts.

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* Correspondence: aishkov@gmail.com

The aim of the article is to analyze the Myers-Briggs typology from the position of classification of natural specializations in order to identify their overlaps, differences and possible ways of integration and development of these concepts. Within the framework of the research the following tasks are solved:

1. To compare the theoretical bases of Myers-Briggs typology and CNS to identify their similarities and differences.
2. To assess the possibility of using the identified similarities and differences of the two approaches for the development of Myers-Briggs typology and CNS.

The scientific novelty of the work consists in the first systematic comparison of the Myers-Briggs typology based on psychological characteristics with the CNS based on biological criteria. This may allow, for example, to improve the accuracy of Myers-Briggs typology diagnosis by switching from questionnaire-based techniques to neurophysiological research methods.

The work contributes to the debate on the future of management practices by demonstrating that a synthesis of psychology and neurophysiology can provide the basis for a personalized, evidence-based approach to human development.

2. Classification of Natural Specializations

The classification of natural specializationsIshkov [3] is based on the telescopic model of the natural cycle of activity [4]. The telescopic model emerged as a result of revealing the similarity between the descriptions of a) the four learning styles of Honey and Mumford [5] according to the experience-based learning model of Kolb [6] and the descriptions of b) the Hippocratic temperament types Ishkov [7] and c) the classical temperament types of the classification "Priority" [8]. The analysis of the revealed similarity allowed to understand that the classical types of temperament characterize 4 types (specializations) of people, each of which is most effective at its stage of the four-stage cycle of activity, laid down by nature in the structure of the nervous system [4]. The telescopic model of the natural cycle of activity developed on this basis includes three private models: small, middle and large.

The small telescopic model contains 4 stages of the natural cycle of activity: search → analysis → synthesis → realization. These stages correspond to the four quadrants of the rectangular coordinate system. The poles of the horizontal axis of the coordinate system are: 1) "orientation on internal factors (own ideas)" and 2) "orientation on external factors". At the vertical axis of the coordinate system the poles are: 3) "orientation on perception (comprehension)" and 4) "orientation on actions (visible activity)". In the structure of the human nervous system, the following components correspond to these four poles:

1) Visceral (Internal) nervous subsystem regulating the work of internal organs, glands of internal and external secretion, blood and lymphatic vessels.
2) Somatic (External) nervous subsystem, aimed at interaction with the outside world. 3.
3) Afferent (Input, perceiving) nervous subsystem, oriented to the perception of input signals: both external (Somatic) sensations and internal (Visceral) signals. This subsystem converts the emerging stimuli into nerve impulses to the central nervous system, i.e. provides the transmission of signals to the central nervous system.
4) Efferent (Output, executive) nervous subsystem, which conducts excitation (Impulses) from the central nervous system to internal organs and muscles. The efferent subsystem is oriented to the issuance of control (Output) signals and reactions: both external (somatic), regulating the activity of skeletal muscles, and internal (visceral), controlling the work of internal systems and organs of the body.

The priority of the somatic and efferent nervous subsystems leads to the dominance of the search stage associated with the sanguine type of temperament [7] or the motor part of the nervous system [8]. The priority of somatic and afferent nervous subsystems leads to the dominance of the analysis stage associated with the melancholic type of temperament [7] or the sensory part of the nervous system [8]. The priority of the visceral and afferent nervous subsystems leads to the dominance of the

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synthesis stage associated with the phlegmatic type of temperament [7] or the intuitive (according to the classification of "Priority") part of the nervous system [8]. The priority of the visceral (internal) and efferent nervous subsystems leads to the dominance of the realization stage associated with the choleric type of temperament [7] or the tonic (according to the "Priority" classification) part of the nervous system [8].

The middle telescopic model reveals the specifics of the stages' realization, distinguishing 2 half-stages on each of the four stages of the small model. One half-stage is connected with the priority of the left hemisphere of the brain, which is responsible for abstract (verbal-logical, speech) thinking (the second signal system according to Pavlov [9]). And the second half-stage is connected with the priority of the right hemisphere responsible for concrete (Figurative) cognition (The first signal system according to Pavlov [9]). The qualitative realization of each stage is ensured by the participation of both (Left- and right-hemispheric) half-stages.

The large telescopic model specifies the specifics of the realization of the half-stages, allocating 2 quarter-stages on each of the eight half-stages. The quarter-stages reflect the peculiarities of functioning (afferent or efferent) of the non-priority pole of the dichotomy "orientation to one's own perceptions" / "orientation to external factors". In stages with the non-priority pole "orientation to own perceptions" the quarter-stages will be intuitive or tonic. For stages with the non-priority pole "orientation to external factors", the quarter-stages will be sensory or motor.

The structural scheme of classification of natural specializations practically coincides with the structural scheme of the telescopic model of the natural cycle of activity, except that in the CNS scheme the names of stages are replaced by the names of specializations and there may be no arrows indicating the sequence of stages.

At the first level of the CNS there are 4 classical specializations, each of which is associated with a its stage of the telescopic model: Searcher, Analyst, Synthetic and Realizator. In Fig. 1, after the name of the classical specialization in parentheses are the names of their corresponding temperament types according to Hippocrates and to the classification temperaments "Priority".

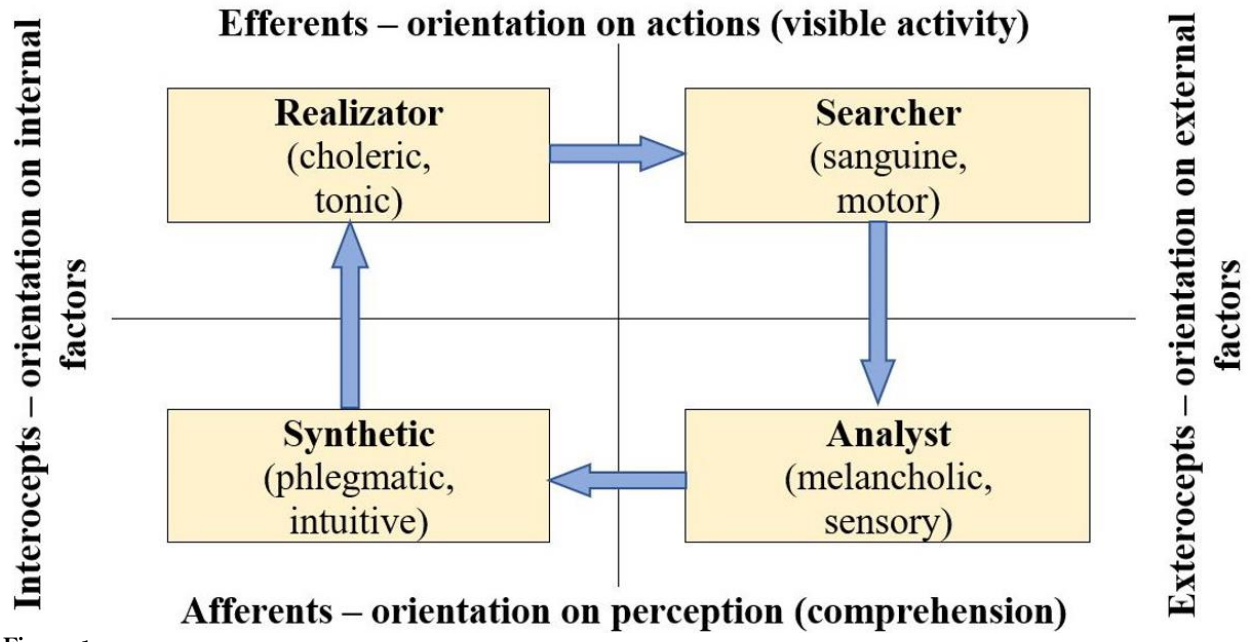

Figure 1.
Classical specializations CNS.

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The process of origin, conduction, perception and processing in the central nervous system of information arising as a result of excitation of interoceptors – receptors of internal organs, is called interoception. Therefore, Synthetics and Realizations belong to interocepts – people with a priority visceral (Vegetative, internal) nervous subsystem, whose orientation to their own states and ideas prevails.

The process of perception and processing of stimuli from the environment by the organism is called exteroception. Therefore, Searchers and Analysts belong to exterocepts – people with a priority somatic (External) nervous subsystem. They have a predominant orientation to external factors and are good at tracking external signals, events, and phenomena. It should be noted that the concepts of "exterocept" and "interocept" are in no way connected with the Jungian concepts of "extrovert" and "introvert".

Analysts and Synthetics belong to afferents – people with a priority afferent (Input, perceiving) nervous subsystem. Analysts have a predominant orientation to the perception of external (Somatic) sensations, while Synthetics have a predominant orientation to the perception of internal (visceral) input signals. To an outsider, the behavior of an afferent attuned to perception often looks like passivity [10].

Searchers and Realizations belong to efferents – people with a priority efferent (output, executive) nervous subsystem. Searchers have predominant orientation to external (somatic) output signals regulating the activity of skeletal muscles, and Realizations – internal (visceral) output signals controlling the work of internal systems and organs of the body. When viewed from the outside, an efferent often looks like a person oriented to active actions [10].

The Searcher is focused on searching for and experimenting with new information. The Analyst specializes in analyzing information in depth and identifying patterns. The Synthetic and focuses on building systems and concepts, while the Realization is focused on turning their ideas and concepts into reality.

In each of the four classical natural specializations, both right and left hemispheres can be prioritized. Therefore, at the level of the middle telescopic model in the CNS, two dichotomies ("Interocept/exterocept" and "afferent/efferent") used at the stage of distinguishing the four classical specializations are supplemented by a third dichotomy ("Right-hemispheric (Concrete) / left-hemispheric (Abstract)") aimed at identifying the priority (Dominant) brain hemisphere. Thus, at the second level of the CNS, 8 basic natural specializations associated with the half-stages of the middle telescopic model are distinguished.

1. Searcher concrete – Active, energetic and task-oriented.
2. Searcher abstract – Active and organized, with a well-developed analytical mind.
3. Analyst concrete – Sensitive, inclined to perceive images and details.
4. Analyst abstract – Sensitive, analytical, and oriented toward inner experiences.
5. Synthetic concrete – Calm, stable, and receptive to imaginative information.
6. Synthetic abstract – Poised, systematic, and oriented toward abstract concepts.
7. Realization concrete – Determined, emotionally expressive, and responsive to concrete stimuli.
8. Realization abstract – Energetic, goal-oriented and prone to strategic planning.

In the human body, the nervous system exercises constant control over both the state of the organism (visceral nervous subsystem) and the external environment (somatic nervous subsystem). Thus, both subsystems function simultaneously, but one of them is a priority (main) and the second one is auxiliary [11]. A rigid hierarchy between nervous subsystems belonging to one dichotomous pair is necessary to exclude their competition, which can lead to the organism's death due to internal conflict in a critical situation [12]. The functioning of the auxiliary (Non-priority) nervous subsystem, as a rule, is less noticeable, but its peculiarities are tangibly reflected in human behavior. These features become more noticeable if a person enters the mode of free functioning of the auxiliary subsystem.

To take into account the peculiarities of the functioning of the auxiliary nervous subsystem, a fourth dichotomy is added at the level of the large telescopic model in the CNS to the three dichotomies used at the stage of identifying the eight basic specializations. The fourth dichotomy "afferent/efferent" (input or output orientation) is aimed at identifying the priority (afferent or efferent) pole for the non-priority

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component of the dichotomy "interocept/exterocept". Thus, the auxiliary (visceral or somatic) nervous subsystem can be both afferent and efferent. In the priority and auxiliary (According to the "visceral/somatic" dichotomy) nervous subsystems, afference-efference can either coincide or differ.

If a person is exterocept (Searcher or Analyst), then his integral specialization is supplemented by the characteristic "synthetic" or "realizator" ("intuitive" or "tonic" in the classification "Priority"). If a human being is an interocept (Synthetic or Realizator), then his integral specialization is supplemented by the characteristic "searcher" or "analyst" ("motor" or "sensory" in the classification "Priority"). Taking into account the above additions, 16 integral (Detailed) natural specializations associated with the quarter-stages of the large telescopic model are distinguished at the third level of the CNS (Fig. 2).

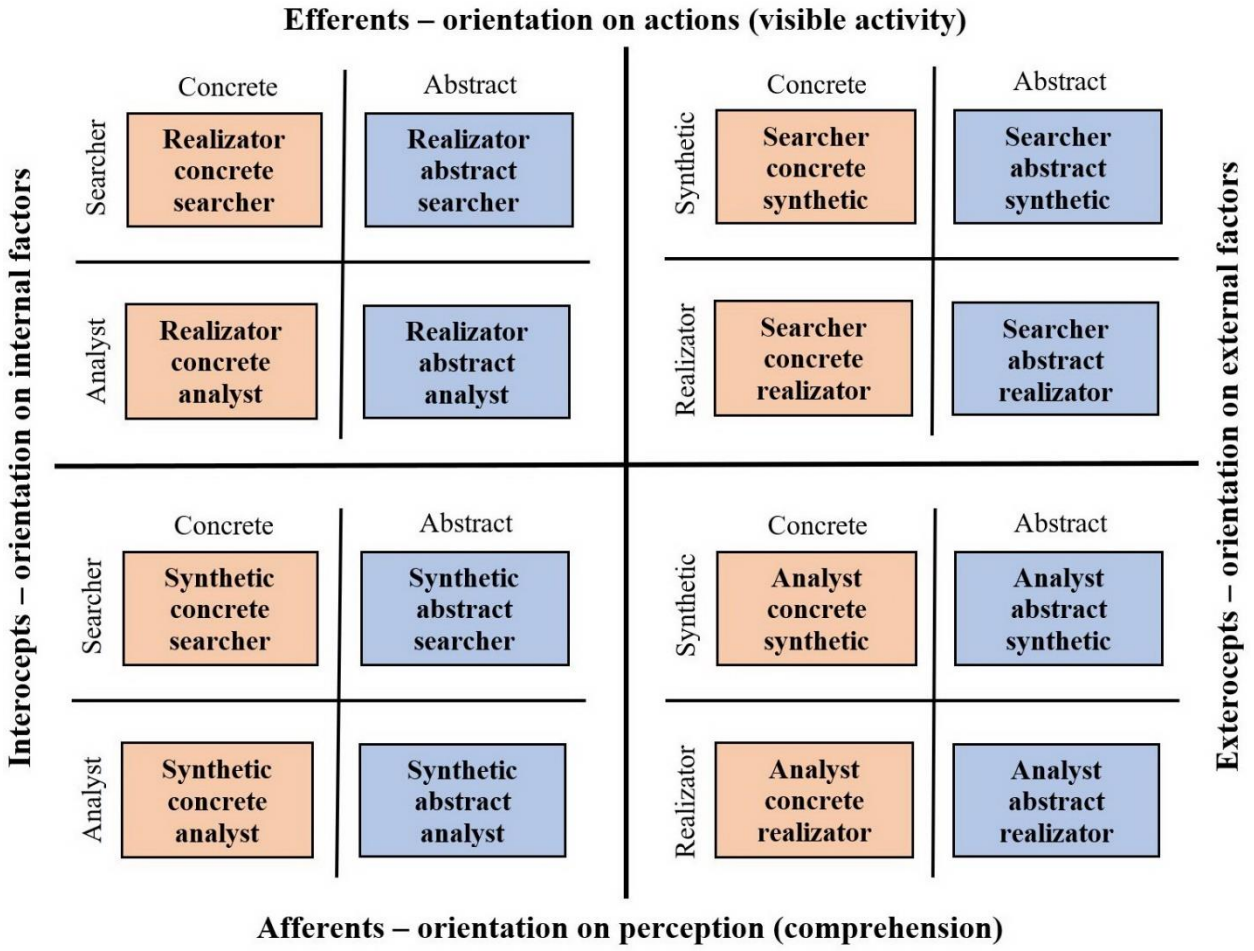

Figure 2.
Integral specializations CNS.

Thus, the classification of natural specializations (Like the telescopic model of the natural cycle of activity) contains 3 levels:

1. Classical, on which 4 classical specializations (Searcher, Analyst, Synthetic and Realization) are distinguished.
2. Basic, which highlights 8 basic specializations that take into account the dominant hemisphere of the brain.
3. Integral (Detailed), which highlights 16 integral specializations that take into account afferent or efferent orientation of the non-priority pole of the dichotomy "interocept or exterocept".

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The classification of natural specializations is based on the innate features of the nervous system structure, which remain unchanged throughout a person's life, which makes it possible to increase the accuracy of forecasts of employee behavior and the efficiency of personnel management.

3. Myers-Briggs Typology

The Myers-Briggs typology, implemented in MBTI Myers, et al. [1] is a modernization of C.G. Jung's personality typology by Myers, et al. [1] in the mid-twentieth century [2]. The main idea of the Myers-Briggs typology is that human behavior and preferences can be described using four dichotomies reflecting the basic processes of mental activity.

1. Extraversion (E) / Introversion (I): orientation of consciousness (energy) – outward, toward objects or inward, toward the subject.
2. Sensing (S) / Intuition (N): orientation to concrete data or to abstract information.
3. Thinking (T) / Feeling (F): the way of decision making – logical analysis or value-emotional evaluation.
4. Judging (J) / Perceiving (P): orientation towards structure and planning or towards flexibility and spontaneity.

Each type of Myers-Briggs typology has a code consisting of four letters arranged in the above-mentioned order of dichotomies, for example, ESTJ (extraversion, sensing, thinking, judging) or INFP (introversion, intuition, feeling, perceiving). These codes describe stable preferences – not absolute attitudes, but inclinations to one of the poles of each dichotomy. A total of 16 personality types are identified in the Myers-Briggs typology.

MBTI researchers often criticize its psychometric adequacy, doubting its reliability, validity, etc. [13-20]. Despite the criticism, the MBTI has an extremely high popularity worldwide and is used in a wide variety of activities, which can be clearly seen from the following list of only a small part of MBTI-related scientific publications for 2024 and early 2025.

MBTI has been widely used in educational activities, with its help.

- The abilities of students of different personality types to think mathematically Vrasetya and Nasution [21] to understand mathematical concepts [22] and to solve problems according to the Pythagoras theorem [23] are studied.
- The influence of MBTI types on the selection of learning resources [24] and courses [25] is studied.
- Investigates the relationship between personality types and tendency to learn physical education [26].
- The influence of MBTI types on basic English literacy is studied [27].
- The relationship of personality types with students' academic performance [28] as well as demographics and career values [29] is explored.
- The possibilities of presenting educational content in accordance with individual characteristics of students on the basis of MBTI in personalized e-learning systems are studied [30, 31]. Including gamification settings [32].
- Investigates the relationship of personality types with students' psychological well-being [33] depression and quality of life [34].

In recent years, social networking, artificial intelligence and machine learning developers have paid close attention to MBTI. Machine learning (ML) and natural language processing (NLP) techniques are being used to determine MBTI personality type from text samples extracted from their comments by YouTube users [35]. Methods are being developed to analyze people's personalities from text in social media [36]. This includes exploring the use of machine learning to determine an author's MBTI type from text-based social media posts [37]. MBTI has been used to create more human-like and differentiating artificial intelligence systems [38]. The use of tree models to classify MBTI personality types is being investigated [39]. Researchers are trying to improve the accuracy of MBTI type

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detection using machine learning [40] and from textual data using word embedding techniques [41]. They are learning to identify MBTI types by automatically extracting handwriting characteristics from written documents [42]. The application of deep learning models to identify MBTI personality types [43] and the use of MBTI in large language models (LLM) [44] are being studied. Neural networks incorporating MBTI are used to analyze personality traits and behavioral patterns [45]. Based on MBTI, a system has been developed to help people understand themselves and create effective communications [46].

The interest in MBTI as a tool for professional orientation, personality assessment, and human resource management has not waned. The influence of MBTI type on occupational choice [47] and driving behavior Bai, et al. [48] is being studied. MBTI is used to assess the potential of managers Dolgaya [49] to allocate employees according to their personality traits Ikhram and Ramsari [50] and for human resource management [51, 52]. Including career building and team building [53]. The relationship of MBTI types with effective marketing approaches [54] with working conditions and productivity [55] with job satisfaction and well-being [33] and with stress perception [56] is investigated. The use of MBTI as a tool for psychological assessment of personality [57] and prediction of personality behavior [58] is described. The role of the MBTI in counseling is reviewed [59]. MBTI is used to determine types of historical personalities [60] and literary characters [61]. There are publications studying the relationship of MBTI types with prayer preferences [62].

Work continues on improving the MBTI Butt, et al. [63] and creating a better questionnaire [64] comparing the MBTI with other techniques [65] and analyzing the methodology and critiques of the MBTI [66].

C.G. Jung's typology and MBTI have 4 main functions ("Thinking", "Feeling", "Sensing", "Intuition"), which are the poles of two dichotomies, according to which types are distinguished. Two of these functions belong to judging ("Thinking", "Feeling") and the other two to perceiving ("Sensing", "Intuition"). The distribution of Myers-Briggs types by primary functions is shown in Fig. 3. In the diagram, the designations of the four MBTI types, in which this function is the main one, are given in parentheses after the name of the main function.

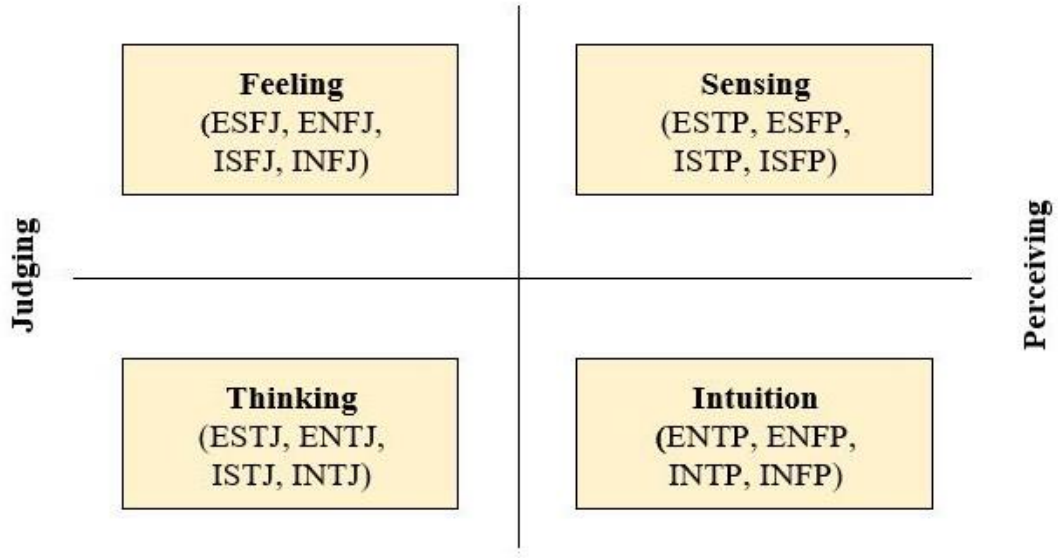

Figure 3.
Distribution of Myers-Briggs types by primary functions.

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If to the distribution of Myers-Briggs types according to the primary function, presented in Fig. 3, add the distribution of types by orientation of consciousness ("extraversion/ introversion") and by additional function, the scheme presented in Fig. 4.

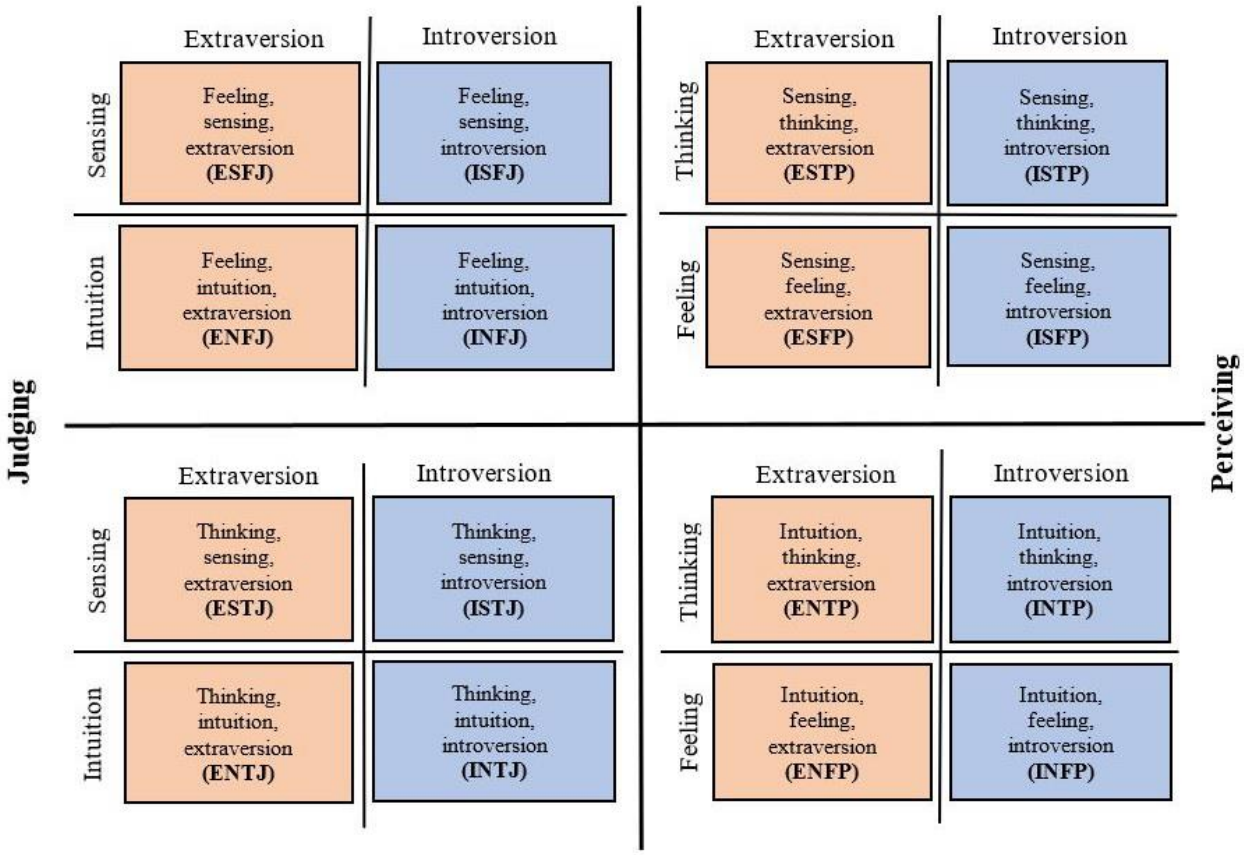

Figure 4.
Distribution of Myers-Briggs types by primary function with regard to orientation of consciousness ("extraversion/ introversion") and additional function.

The Myers-Briggs typology, like C.G. Jung's typology, is an empirical typology in which types are distinguished on the basis of psychological (behavioral) characteristics of a person. These characteristics have many different interpretations, because they are detached from the material substrate, as which in the modern scientific paradigm only the human nervous system is considered. Therefore, the problem of the psychometric adequacy of the MBTI can be resolved only if a reliable neurophysiological justification of the dichotomies of the Myers-Briggs typology is obtained.

4. Comparative Analysis of Structural Models of Classification of Natural Specializations And MBTI

Many researchers, including Pavlov [9]; Eysenck [67]; Ruch [68]; Golovanova [69] have tried to use the properties of the nervous system to distinguish types of people. However, it is known from the theory of systems and system analysis that only the structure of a system "reflects the most essential relations between elements and their groups" [70] and "determines all possible properties that a system can possess" [71]. This point of view is also shared by dialectical materialism [72]. That is why nowadays the structure of the nervous system is more and more often used to distinguish typesHerrmann [73] and McCarthy [74] because from the modern point of view it is the structure of

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the nervous system that is the basis determining many properties of the nervous system. And countless psychological (behavioral) characteristics of a person are formed on the basis of the properties of the nervous system. Therefore, the farther the typology is from the basis (nervous system structure) that determines human behavior, the less accurate predictions it will produce. Since the CNS contains (like the MBTI) 16 types (specializations), but they are allocated not on the basis of external behavioral characteristics, but on the basis of the peculiarities of the nervous system structure, a comparative analysis of the structural models of the CPS and MBTI can be very informative.

C.G. Jung's basic functions (and, accordingly, MBTI) are interrelated with classical natural specializations as follows: sensing – Searcher; intuition – Analyst; thinking – Synthetic; feeling – Realization [3]. The dichotomy "extraversion / introversion" of MBTI corresponds to the dichotomy "concrete (right-hemispheric) / abstract (left-hemispheric)" of CNS [3].

The dichotomy "afferent / efferent" CNS in MBTI is divided into two private dichotomies "thinking / feeling" (for interocepts) and "intuition / sensing" (for exterocepts) [3].

Based on the above, we can categorize the MBTI types according to the CNS structure as shown in Fig. 5.

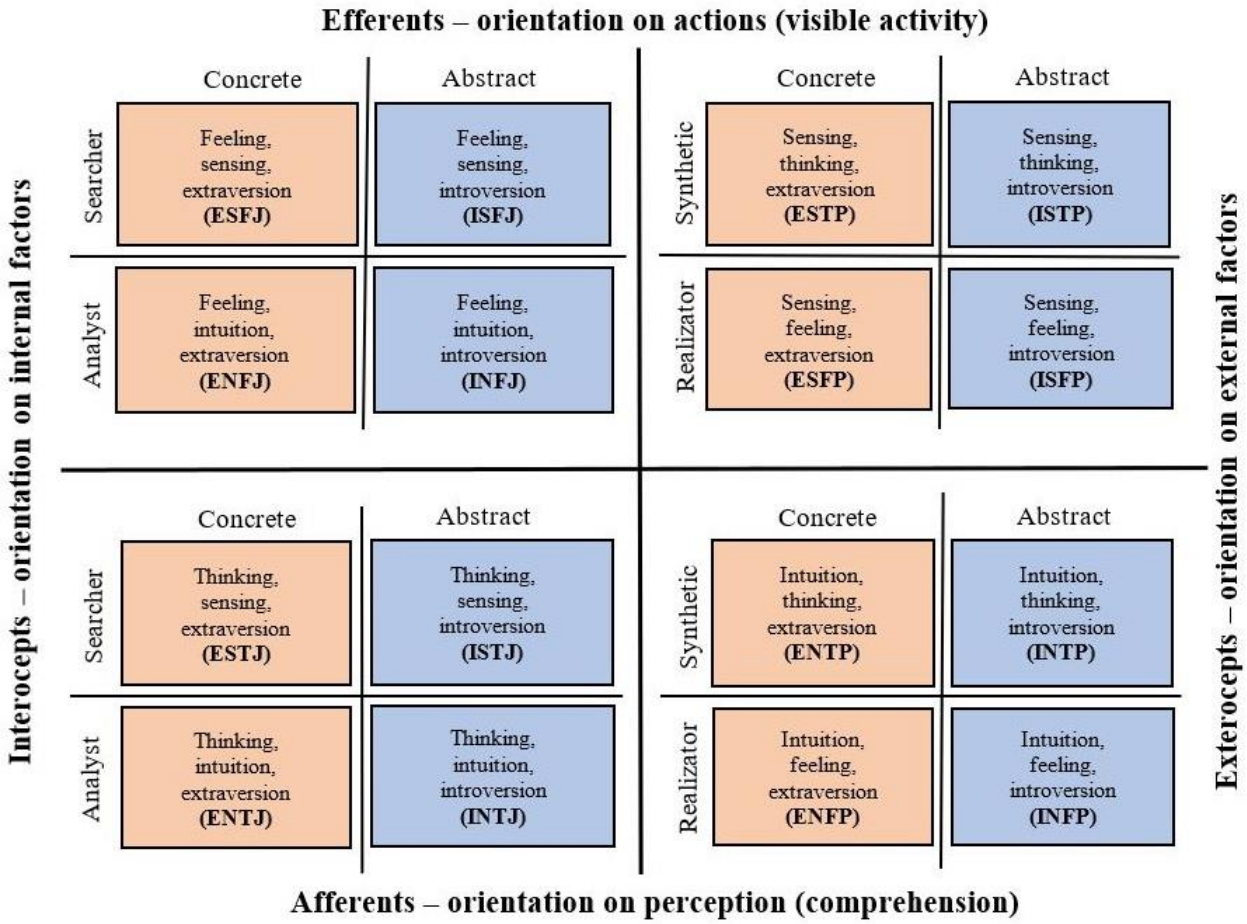

Figure 5.
Distribution of MBTI types according to the structure of classification of natural specializations.

In this case, MBTI types will correspond to the following integral natural specialization (Table 1).

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Table 1.
Relationship between MBTI types and integral natural specializations.

№	Type designation in MBTI	Integral natural specialization
1.	ESTP	Searcher concrete synthetic
2.	ESFP	Searcher concrete realizator
3.	ISTP	Searcher abstract synthetic
4.	ISFP	Searcher abstract realizator
5.	ENTP	Analyst concrete synthetic
6.	ENFP	Analyst concrete realizator
7.	INTP	Analyst abstract synthetic
8.	INFP	Analyst abstract realizator
9.	ESTJ	Synthetic concrete searcher
10.	ENTJ	Synthetic concrete analyst
11.	ISTJ	Synthetic abstract searcher
12.	INTJ	Synthetic abstract analyst
13.	ESFJ	Realizator concrete searcher
14.	ENFJ	Realizator concrete analyst
15.	ISFJ	Realizator abstract searcher
16.	INFJ	Realizator abstract analyst

The revealed relationship between MBTI and CNS dichotomies, as well as the correspondence between MBTI types and integral specializations of CNS, makes it possible to analyze MBTI dichotomies and types from neurophysiological positions. In the future, this can be used to refine descriptions of MBTI types and to develop hardware methods for their diagnosis.

5. Conclusion

The comparative analysis of Myers-Briggs typology and CPS has shown the following.

The Myers-Briggs Typology (MBTI) is based on the empirical description of human psychological preferences, identifying 16 types through four dichotomies: "extraversion / introversion", "sensing / intuition", "thinking / feeling", "judging / perceiving".

The classification of natural specializations (CNS) is based on the structural features of the nervous system and distinguishes 16 natural specializations using four dichotomies: "interocept / exterocept", "concrete / abstract" and twice "afferent / efferent" (for the priority and non-priority pole of the dichotomy "interocept / exterocept"). The CNS, developed on the basis of the telescopic model of the natural cycle of activity, has three levels, distinguishing on them, respectively: 4 classical, 8 basic and 16 integral specializations.

The MBTI dichotomy "extraversion / introversion" corresponds to the dichotomy "concrete (right-hemispheric) / abstract (left-hemispheric)" of the CNS. The main functions of MBTI ("sensing", "intuition", "thinking", "feeling") correspond with classical specializations of CNS: Searcher, Analyst, Synthetic and Realizator respectively. The dichotomies "sensing / intuition" and "thinking / feeling" of MBTI correspond to the dichotomy "afferent / efferent" for each of the poles of the dichotomy "interocept / exterocept" of CNS.

The correspondence of 16 MBTI types in 16 integral specializations of CNS is established, which reveals the neurophysiological basis of each MBTI type, opening the way to a more objective diagnosis of the types through the methods of neurophysiology. The use of objective neurophysiological criteria of CNS can increase the reliability and validity of MBTI and allow to create more personalized HR-strategies, taking into account the natural features of employees.

In general, a systematic comparison of the MBTI and the CNS demonstrates their structural similarity at different levels of content - psychological and biological. This allows us to consider the MBTI as a private, psychological level of the broader neurophysiological model of the CNS. MBTI and CNS, despite their different approaches and methodology, describe the same underlying individual differences in humans. The identified correspondence between the sixteen MBTI types and the sixteen

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integral specializations of the CNS opens new perspectives for scientifically based and objective diagnosis of personality types using neurophysiological methods. The use of the neurophysiological criteria can strengthen the scientific basis of the MBTI by reducing the dependence on subjective questionnaires. This will significantly increase the accuracy of behavioral predictions and the effectiveness of the use of typological techniques in education, management, career guidance and other spheres of activity. Taking into account neurophysiological features of a person will allow.

- Form teams where roles are assigned taking into account innate specializations (e.g., "Realizators" CNS for operational tasks, "Synthetics" for strategic planning).
- Increase the effectiveness of personalized learning by adapting curricula to students' neurophysiological profiles (e.g., "Searchers" focus on experimental methods, "Analysts" on structured analysis).
- Design individual development programs that take into account biological characteristics.
- Create "digital twins" of individuals to test career scenarios or educational trajectories.
- Improve the effectiveness of algorithms created to categorize social media users.
- Create digital platforms that use artificial intelligence to automatically customize content for individual users.
- Reduce stress levels by matching work tasks to innate neurophysiological priorities.

Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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