

Bimodal classification of natural specializations as a neurophysiological basis of dichotomous typologies: A comparative analysis with MBTI

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Abstract: The article presents a theoretical and methodological substantiation of the Bimodal Classification of Natural Specializations (CNS-B) and its comparative analysis with the Myers–Briggs Type Indicator (MBTI). The study aims to identify fundamental differences between the phenomenological description of personality preferences in the MBTI and the neurophysiologically grounded CNS-B model, which is based on the principle of alternative paired regulation of activity. The methodological approach used in the CNS-B allows for a strict separation of the cognitive and functional-regulatory levels of description. The CNS-B introduces and theoretically substantiates the concepts of natural and artificial activity specializations. The main results include a structural representation of the CNS-B through four dichotomies forming 16 integral natural specializations, and their comparison with MBTI types. It is demonstrated that the instability of typing in the MBTI is explained by its sensitivity to compensatory behavioral profiles, whereas the CNS-B captures a stable neurophysiological foundation. A comparative analysis of the 16 integral CNS-B specializations and MBTI types reveals partial and asymmetric correspondence, highlighting the limitations of the phenomenological approach. The conclusion substantiates the possibility of using the CNS-B as a metatheoretical framework for interpreting and refining the results of dichotomous typologies.

Keywords: *Artificial specialization, Bimodal Classification of Natural Specializations, CNS-B, Cognitive specializations, Dichotomies, Functional-regulatory specializations, Individual differences, MBTI, Natural specialization, Myers–Briggs Type Indicator, Personality typology.*

1. Introduction

Psychological typologies based on dichotomous characteristics have occupied a prominent place in the study of personality, human behavior, and organizational management for more than a century. Among these models, the Myers-Briggs Type Indicator (MBTI) is the most widely known. It was developed by Katharine Cook Briggs and her daughter Isabel Briggs Myers based on an interpretation of Carl Jung's ideas on psychological types [1]. Using four dichotomies – extraversion/introversion, sensing/intuition, thinking/feeling, and judging/perceiving – the MBTI distinguishes sixteen personality types [2].

The MBTI questionnaire is widely used in education [3-6], personnel selection and career development [7-10], group counseling [11], identification and development of entrepreneurial potential [12], and the study of driving behavior [13] as well as for personality assessment based on social media publications [14], among other applications [15]. The MBTI is used not only in applied contexts but has also become popular in everyday culture. For example, in China [16] and South Korea [17-19], personality types are actively discussed in the media and social networks in relation to personal preferences, compatibility, and self-knowledge.

At the same time, widespread popularity is not a direct indicator of scientific validity. In both academic and professional literature, debates regarding the cognitive and methodological limitations of the MBTI continue unabated [20-29]. Researchers point to the limited psychometric reliability and

validity of the questionnaire, noting that typing results are often unstable across repeated measurements and that the dichotomies employed correspond poorly to the continuum-based models of individual differences that dominate contemporary psychometrics.

Scientific publications also emphasize the conflation within the MBTI of phenomenological aspects (behavioral preferences) with functional cognitive mechanisms, which hinders a clear explanation of causal relationships between types and actual psychophysiological processes. Thus, evaluations of the MBTI as a personality assessment instrument include both practical evidence of its usefulness and critical remarks regarding the insufficiency of its theoretical foundations, standardization, and predictive power.

Under these circumstances, the scientific community increasingly discusses the need to develop and analyze models grounded in more robust methodological foundations and neurophysiological principles. One such model is the Bimodal Classification of Natural Specializations (CNS-B), which, based on the principle of alternative paired regulation of activity, identifies natural specializations describing systemic and stable features of cognitive and regulatory processes at the neurophysiological level [30]. By relying on objective principles of regulation and physiological mechanisms, the CNS-B provides a deeper understanding of individual differences.

The purpose of this article is to present the theoretical and methodological foundations of the bimodal classification of natural specializations, to explicate its structure and functional bases, and to conduct a systematic comparative analysis of the CNS-B and the MBTI at the level of dichotomies, dichotomous poles, and types (specializations). Such an analysis, aimed at identifying both points of convergence and fundamental differences between the models, makes it possible to clarify the limits of applicability of phenomenological typologies and to demonstrate the advantages of a neurophysiologically oriented approach to the analysis of individual differences.

The scientific novelty of the present study lies in a multilevel analysis of dichotomous typologies, within which the MBTI is considered not as a universal model of individual differences but as a phenomenological description that does not distinguish between natural and adaptively formed (artificial) specializations of activity. The paper introduces and theoretically substantiates the concept of a natural specialization of activity as an energetically optimal mode of nervous system functioning, relative to which adaptive and compensatory behavioral profiles (artificial specializations) are formed. Such differentiation of analytical levels makes it possible to reinterpret the stability and variability of typological characteristics and to explain the phenomena of typing instability characteristic of dichotomous personality models.

2. Methodological Foundations for the Analysis of Individual Differences

The analysis of stable individual differences in human activity requires a strict methodological separation of levels of description and a clear specification of the grounds for typologization. Otherwise, typological models inevitably encounter internal contradictions, diagnostic instability, and limited explanatory power. This problem is most characteristic of dichotomous typologies, in which cognitive, regulatory, and behavioral features, belonging to different levels of activity organization, are combined within a single system of oppositions.

In the present study, the principle of alternative paired regulation of activity is used as the basic methodological principle. This principle is applied in neurophysiology and the theory of functional systems to describe stable regulatory oppositions. According to this principle, the regulation of nervous system activity is carried out through alternative, functionally complementary regulatory circuits, which ensure adaptability, stability, and relative energetic efficiency of activity. Such paired mechanisms are observed at various levels of nervous system organization, from autonomic regulation to cortical information-processing processes.

From a neurophysiological perspective, stable individual differences can be interpreted as a consequence of the preferential use of one of the alternative regulatory circuits, which determines an energetically optimal mode of activity for a given individual. In this context, individual differences are

understood not as a set of psychological traits but as differences in the basic organization of regulation and information processing.

Methodologically, it is crucial to distinguish between the levels of analysis of individual differences, which in the present work are regarded as interconnected but not identical:

1. The neurophysiological level reflects objective features of nervous system functioning, including priorities of autonomic regulation, the orientation of regulatory circuits, and characteristics of sensory and motor organization. This level is natural in origin, formed congenitally or in early ontogenesis, and remains unchanged.
2. The cognitive level characterizes the ways in which information is acquired, encoded, and processed. It is based on neurophysiological mechanisms but manifests itself in preferences of thinking, perception, and decision-making. Unlike behavioral strategies, cognitive differences do not directly depend on social roles or situational demands.
3. The behavioral level includes observable forms of activity, behavioral strategies, and professional roles. This level is the most variable and is strongly influenced by learning, social norms, and current task demands.

One of the key methodological errors of dichotomous psychological typologies is the conflation of these levels. Within a single dichotomy, cognitive preferences, regulatory modes, and behavioral patterns may be described simultaneously. As a result, types become internally heterogeneous, and their diagnostic boundaries become blurred, reducing the reproducibility and explanatory power of models.

From the standpoint of a neurophysiologically oriented approach, a valid typological model must satisfy the following requirements.

- Possess clearly defined functional and physiological foundations for its dichotomies, without mixing levels of description.
- Ensure an unambiguous correspondence between the level of regulation and the level of interpretation of typological differences.
- Interpret typological differences as priority modes of activity rather than static personality traits.
- Explain adaptive and compensatory forms of behavior without introducing additional typological entities.

The Bimodal Classification of Natural Specializations, developed based on the Bimodal Theory of Natural Specialization of the human nervous system [31], largely meets these requirements and can be regarded as a meta-level analytical model that enables the identification of neurophysiological foundations and methodological limitations of psychological dichotomous typologies.

3. Limitations of the MBTI

At present, interest in the MBTI remains high, primarily in applied domains – personnel management, corporate training, career counseling, and coaching. Owing to its simple structure, visually intuitive results, and ease of interpretation for non-specialists, the MBTI remains one of the most widely used typological instruments in corporate practice. These circumstances account for its sustained demand outside the academic context, despite ongoing scientific debates regarding its theoretical status.

At the same time, in recent years, academic criticism of the MBTI has acquired a more systematic and methodologically grounded character. Most contemporary studies focus not on denying the practical applicability of the instrument as such, but on analyzing the limited validity of its typological foundations and the assumptions underlying result interpretation. Researchers' critiques mainly concern three interrelated factors:

- Instability of typing across repeated measurements exists. Even when official versions of the questionnaire are used, a substantial proportion of respondents change their type or demonstrate shifts in one or more dichotomous poles, or form mixed profiles. It is emphasized that the

dichotomous nature of the scales leads to an artificial, discrete division of continuous psychological characteristics, thereby reducing the reproducibility and reliability of results.

- Lack of consistently reproducible links with contemporary neurobiological and neurocognitive models of personality. Unlike factor-based models such as the Big Five, the MBTI does not have clearly established correlates at the level of neurophysiological indicators or cognitive neuroscience. This significantly limits the use of the MBTI in fundamental scientific research and complicates the neurophysiological substantiation of its dichotomies.
- Systematic conflation of different levels of analysis within the structure of the MBTI is evident. For example, extraversion and introversion are often interpreted simultaneously as social orientation, cognitive style, and energetic mode of activity. Such polysemous use of a single dichotomy blurs diagnostic criteria and complicates result interpretation. Similar methodological problems are identified in the analysis of sensing/intuition and judging/perceiving dichotomies, whose content varies from cognitive processes to behavioral strategies and regulatory characteristics.

In applied practice, the MBTI is increasingly regarded as a phenomenological tool useful for self-reflection, team interaction, and discussing differences in work styles, but not as a rigorous scientific model of personality. This approach implies interpreting types as conventional descriptions of preferences and behavioral strategies.

It is precisely in this context that the need arises to develop and analyze models that preserve the practical value of dichotomous descriptions while being grounded in more fundamental, neurophysiologically oriented foundations. Within the present study, the CNS-B is considered such a model – one that makes it possible to explain empirical findings obtained within the MBTI framework, identify sources of diagnostic distortions, and establish a more rigorous methodological framework for analyzing individual differences.

4. Bimodal Classification of Natural Specializations

The Bimodal Classification of Natural Specializations is based on the assumption that stable individual differences in human activity are determined by the preferential use of alternative regulatory circuits of the nervous system. Unlike psychological typologies that primarily describe phenomenological manifestations of personality, the CNS-B relies on neurophysiological principles of regulatory organization and interprets individual differences as a consequence of differences in energetically optimal modes of nervous system functioning.

Within the CNS-B framework, individual differences are interpreted not as a set of personality traits but as natural specializations of activity, that is, stable priorities in the ways information is acquired, processed, and activity is regulated. These priorities are innate or formed in early ontogenesis and retain relative stability throughout the lifespan despite substantial variability in behavioral forms.

A natural specialization is defined as the basic orientation of the nervous system toward the preferential use of one of the alternative regulatory modes during activity execution. This orientation manifests itself in characteristic cognitive preferences, in the dynamics of activation and inhibition, in features of fatigue and recovery, as well as in stable differences in the energetic efficiency of various types of activity.

It is fundamentally important to distinguish natural specializations from professional roles, skills, and socially conditioned behavioral strategies. Unlike the latter, a natural specialization is not the result of learning or conscious choice and cannot be arbitrarily altered without an increase in energetic costs. It serves as the foundational basis upon which specific forms of activity and behavioral styles are built.

Structurally, the CNS-B consists of two interconnected yet methodologically distinct blocks: a cognitive block and a functional-regulatory (regulatory) block. Each block describes an independent aspect of activity organization and includes its own dichotomies, each of which has functional and neurophysiological foundations.

4.1. Cognitive Natural Specializations

The cognitive block of the CNS-B describes stable differences in the ways information is acquired, encoded, and processed. It includes two fundamental dichotomies – the locus-related and the hemispheric – each reflecting alternative modes of cognitive organization of activity and having a neurophysiological basis.

The locus-related dichotomy internal/external reflects the primary source of cognitive information used by an individual during an activity. With an internal locus, the primary source of cognitive material consists of interoceptive signals, bodily sensations, and internal representations. With an external locus, priority is given to information coming from the external environment through sensory organs.

The neurophysiological basis of this dichotomy lies in the functional distinction between interoceptive and exteroceptive regulatory channels (between the visceral and somatic subsystems of the nervous system). Individuals with a priority of the visceral subsystem are oriented toward internal signals and states and are designated within the CNS-B as interoceptive types (interocepts). Individuals with a priority of the somatic subsystem are oriented toward external stimuli and are designated as exteroceptive types (exterocepts).

It is important to emphasize that the internal/external dichotomy is not equivalent to the psychological dichotomy of introversion/extraversion. Within the CNS-B, it describes exclusively the source of cognitive information, rather than social orientation, level of communicativeness, or preferred forms of interaction.

The second (hemispheric) cognitive dichotomy – concrete/abstract – reflects the preferred mode of information encoding and processing. A concrete orientation is associated with reliance on detailed, context-rich, and imagery-based representations. An abstract orientation is associated with the use of generalized, symbolic, and conceptual structures.

The neurophysiological basis of this dichotomy is the functional asymmetry of the cerebral hemispheres. Priority of the right hemisphere is associated with concrete, imagery-based, and contextual information encoding, whereas priority of the left hemisphere is associated with abstract, logical-categorical, and symbolic representation of data. Within the CNS-B, these differences are interpreted not as rigid functional localization but as stable priorities of information-processing modes related to functional asymmetry and interhemispheric distribution of processing load. Accordingly, concrete (predominantly right-hemispheric) and abstract (predominantly left-hemispheric) cognitive orientations are distinguished.

The combination of priority poles of the locus-related and hemispheric dichotomies forms a closed natural cycle of activity, including four interrelated stages (Figure 1).

- Information exploration (external, concrete);
- Information analysis (external, abstract);
- Synthesis and integration (internal, abstract);
- Implementation of decisions (internal, concrete).

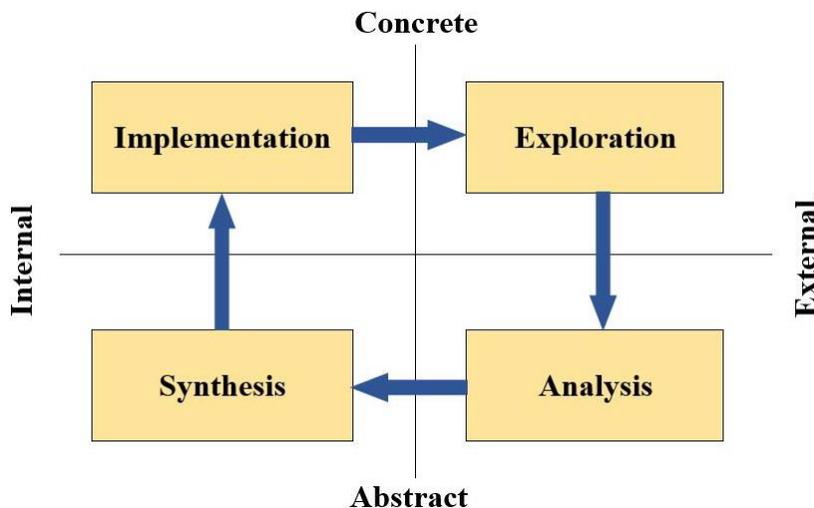


Figure 1.
Stages of the Natural Activity Cycle.

This cycle has an invariant structure and is reproduced in any goal-directed activity, regardless of its content or scale. It reflects the universal logic of transition from signal perception to decision formation and its practical implementation.

Within the CNS-B, cognitive dichotomies are regarded not as independent traits of individual differences but as structural parameters of activity. Cognitive specializations are formed as stable priorities for implementing specific stages of this cycle. Each stage corresponds to a distinct cognitive specialization (Figure 2).

- Explorer – priority of searching for and detecting significant information;
- Analyst – priority of analytical processing and interpretation of data;
- Synthesizer – priority of integration, generalization, and construction of holistic models;
- Implementer – priority of translating decisions into concrete actions.

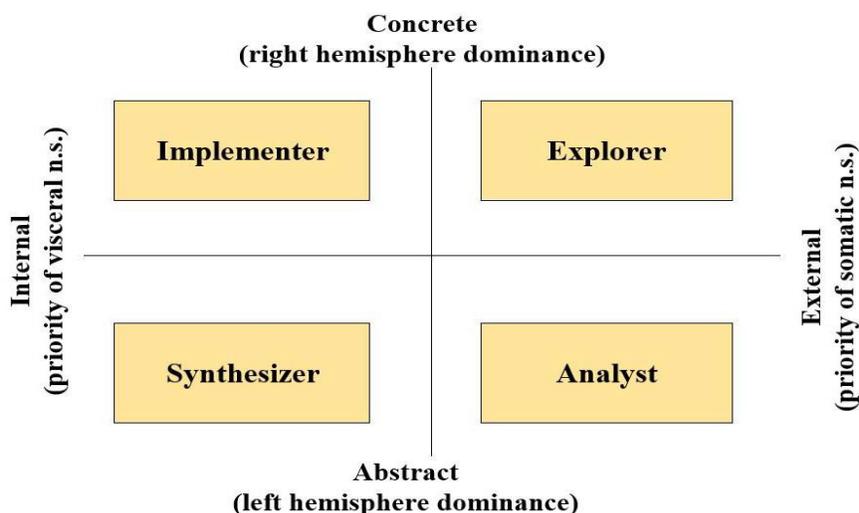


Figure 2.
Cognitive specializations of the CNS-B.

The Explorer specialization is oriented toward identifying facts, events, changes, and opportunities. It is characterized by heightened sensitivity to signals from the external environment, the ability to rapidly detect meaningful changes in activity conditions, and flexibility in adaptation.

The analyst specializes in identifying regularities, causal relationships, and structural relations. This specialization ensures diagnostic accuracy and logical substantiation of managerial decisions.

The synthesizer is oriented toward constructing holistic concepts, strategic models, and new meaning structures. It integrates disparate informational elements into coherent representations and supports the formation of developmental directions.

The Implementer ensures the practical realization of decisions, focusing on actions, procedures, and concrete interventions. This specialization plays a key role in maintaining the operational stability of the activity.

Thus, cognitive specializations reflect structurally distinct priorities in information processing and form the cognitive foundation of the CNS-B.

4.2. Functional-Regulatory Natural Specializations

The functional-regulatory block of the CNS-B describes differences in modes of activity execution and mechanisms of its regulation. It includes two dichotomies (dynamic and vectorial), which reflect the dynamics and directionality of regulatory processes.

The dynamic dichotomy sympathetic/parasympathetic regulation characterizes the predominant mode of autonomic (vegetative) regulation. Sympathetic regulation is associated with mobilization, activation, and acceleration of processes. Parasympathetic regulation is associated with deceleration, resource conservation, and maintenance of stability. This parameter determines the general energetic profile of activity and correlates with psychophysiological characteristics of activation and inhibition.

The vectorial dichotomy afferent/efferent reflects the direction of regulatory control. Afferent orientation is associated with prioritizing perception and processing of incoming information, as well as correction of activity based on feedback. Efferent orientation is associated with the dominance of programming and executive mechanisms and is directed toward action.

The combination of the dynamic and vectorial dichotomies forms four functional-regulatory specializations (Figure 3), whose characteristics allow them to be correlated with classical temperament types in H. Eysenck's model [32] without assuming full equivalence:

- parasympathetic–afferent (melancholic);
- parasympathetic–efferent (phlegmatic);
- sympathetic–efferent (sanguine);
- sympathetic–afferent (choleric).

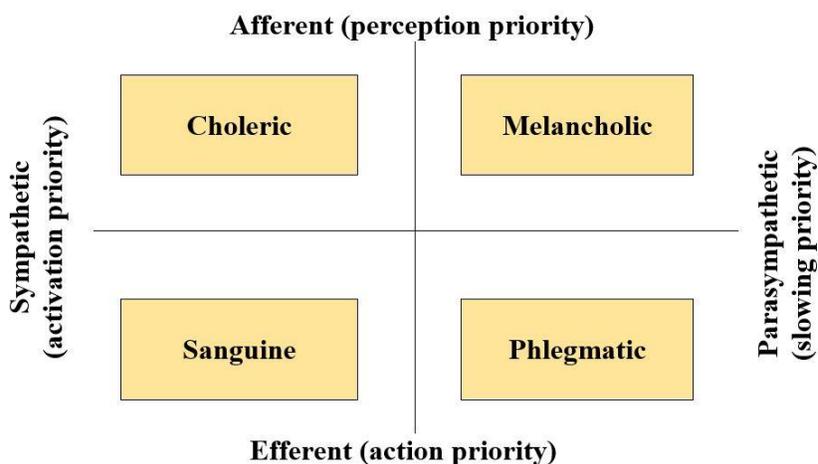


Figure 3.
Functional-regulatory specializations of the CNS-B.

The differentiation between cognitive and functional-regulatory specializations within the CNS-B creates methodological prerequisites for an integral analysis of activity. In real practice, cognitive information-processing modes and regulatory regimes do not exist in isolation but form stable combinations that determine the holistic organization of an individual's activity.

It is precisely at the level of such combinations that differences typically described in psychological typologies as "personality types" emerge. Unlike dichotomous models, including the MBTI, where a type is formed as a combination of phenomenological traits, the CNS-B considers integral specializations as the result of overlaying independent cognitive and regulatory parameters, each having its own neurophysiological basis. This makes it possible to move from the description of isolated dichotomies to the analysis of holistic, energetically optimal modes of activity.

4.3. Integral Natural Specializations

Integral natural specializations are formed as a result of combining the cognitive and functional-regulatory parameters of activity described within the framework of the CNS-B. Each integral specialization represents a stable configuration of priority modes of information processing and activity regulation, ensuring an energetically optimal mode of nervous system functioning under otherwise equal activity conditions.

Unlike psychological typologies, in which a type is interpreted as a set of personality characteristics or behavioral preferences, integral specializations in the CNS-B describe the basic organization of activity. They reflect not externally observable behavioral styles but the internal structure of cognitive activity and regulation, the structure upon which diverse forms of activity are built.

The integration of four cognitive specializations (Explorer, Analyst, Synthesizer, Implementer) and four functional-regulatory specializations (Melancholic, Phlegmatic, Sanguine, Choleric) forms a matrix of sixteen integral natural specializations (Table 1). Each represents a unique combination of a priority cognitive stage of activity and a dominant regulatory regime.

Table 1.
Integral Natural Specializations.

Cognitive Specialization	Melancholic	Phlegmatic	Sanguine	Choleric
Explorer	Explorer-Melancholic	Explorer-Phlegmatic	Explorer-Sanguine	Explorer-Choleric
Analyst	Analyst-Melancholic	Analyst-Phlegmatic	Analyst-Sanguine	Analyst-Choleric
Synthesizer	Synthesizer-Melancholic	Synthesizer-Phlegmatic	Synthesizer-Sanguine	Synthesizer-Choleric
Implementer	Implementer-Melancholic	Implementer-Phlegmatic	Implementer-Sanguine	Implementer-Choleric

Integral specializations are designated by compound terms in which the first component indicates the cognitive content of activity, and the second denotes the functional-regulatory mode of its execution, for example: Explorer-Choleric, Analyst-Sanguine, Synthesizer-Phlegmatic, Implementer-Melancholic. This form of designation fundamentally differs from the symbolic codes used in the MBTI and allows the functional content of activity to be expressed directly, rather than as a combination of abstract personality traits.

Integral specializations within the CNS-B are not personality types in the psychological sense. They do not describe character, motivation, values, or emotional characteristics of the individual. Their function is to identify the basic organization of activity and regulation, relative to which individual behavioral styles and preferences are formed. This approach makes it possible to avoid typological reductionism, which is characteristic of dichotomous personality models. Instead of rigidly assigning an individual to a “type,” the CNS-B proposes viewing an integral specialization as a fundamental activity platform that permits a wide range of external behavioral variations. In this context, the same individual may demonstrate different behavioral styles depending on situational demands, without losing their underlying integral specialization.

Each integral specialization corresponds to an energetically optimal mode of activity organization for a given individual. This means that when activity is carried out in accordance with one’s natural specialization, minimal regulatory cost is achieved alongside high stability and reproducibility of results. Energetic optimality manifests in reduced subjective fatigue, high stability of attention and work capacity, stable performance under prolonged load, and rapid recovery after exertion. Under conditions in which task demands correspond to the individual’s integral natural specialization, the need for compensatory regulatory mechanisms is minimal.

Despite the stability of integral specializations, external behavioral forms may vary substantially. This is due to the fact that the behavioral level of activity is the most plastic and is strongly influenced by social norms, professional standards, and organizational roles. The CNS-B makes it possible to explain situations in which the same individual exhibits behavioral features characteristic of different psychological types. Within this model, such phenomena are interpreted not as changes in the basic specialization but as the implementation of adaptive or compensatory modes of activity superimposed on the natural foundation. It is precisely at this level that phenomena of typing instability and so-called “double types” most frequently arise in psychological typologies, including the MBTI.

The matrix of sixteen integral natural specializations provides a strict analytical basis for comparison with dichotomous typologies. Unlike the MBTI, in which a type is formed as a combination of dichotomous preferences without a clear differentiation of analytical levels, the CNS-B makes it possible to:

- Separate cognitive and regulatory parameters;
- Identify the neurophysiological foundations of psychological dichotomies;
- Explain diagnostic distortions and the instability of types.

This, in turn, enables a detailed comparative analysis of the MBTI and the CNS-B at the level of dichotomies, their poles, and the resulting typological configurations.

5. Natural and Artificial Specializations of Activity

Within the framework of the CNS-B, a principled distinction between natural and artificial specializations of activity is of fundamental importance. This distinction makes it possible to correctly interpret stable individual differences, avoid typological reductionism, and explain the variability of behavioral manifestations depending on activity conditions and social demands.

A natural specialization is understood as an innate or early-formed orientation of the nervous system toward the preferential use of certain cognitive and regulatory modes. Such specialization is determined by neurophysiological characteristics of regulation and information processing and is stable and invariant. It defines an energetically optimal mode of activity and serves as the foundation of individual effectiveness.

An artificial specialization is formed as a result of upbringing, education, professional socialization, and adaptation to environmental demands. It represents a set of acquired strategies, skills, and behavioral patterns that enable an individual to function effectively under conditions that do not fully correspond to their natural specialization.

From a neurophysiological standpoint, the difference between natural and artificial specializations corresponds to the distinction between basic regulatory circuits and superimposed compensatory mechanisms. Natural specializations rely on priority, energetically efficient regulatory circuits that are activated automatically and do not require substantial voluntary control.

Artificial specializations, by contrast, require continuous engagement of additional regulatory mechanisms, including voluntary attention, cognitive control, and conscious planning. This leads to increased energetic costs of activity and makes such modes less stable under prolonged load.

Thus, the distinction between natural and artificial specializations is not evaluative but functional in nature and reflects differences in the ways activity outcomes are achieved.

In real activity, most individuals implement both natural and artificial specializations. Adaptation to professional and social demands often involves a shift from natural modes toward artificially formed ones. This is particularly characteristic of educational and organizational systems in which requirements are standardized and do not account for individual differences.

Compensatory mechanisms allow for temporary increases in effectiveness in activity types that are uncharacteristic for a given individual; however, their prolonged use is accompanied by increased fatigue, reduced stability, and heightened sensitivity to stressors. The CNS-B interprets such phenomena not as deficits of ability or motivation but as a consequence of a mismatch between natural specialization and environmental demands.

One consequence of the predominance of artificial specializations is the emergence of typological distortions in psychological testing. When diagnostics primarily capture behavioral strategies and consciously endorsed preferences, results reflect not the natural foundation of activity but adaptive and compensatory forms. In dichotomous typologies, this manifests as:

- Instability of typing across repeated measurements;
- Shifts in results under the influence of current professional roles;
- Emergence of “borderline” and “mixed” types;
- Dependence of results on item wording and testing context.

From the CNS-B perspective, these effects are not methodological defects per se, but indicators of the limitations of the phenomenological level of description at which most psychological typologies operate. From the CNS-B perspective, MBTI diagnostics do not differentiate between natural and artificial specializations because MBTI dichotomies, while capturing stable preferences in thinking and behavior, do not allow for unambiguous identification of their neurophysiological basis.

For example, MBTI indicators of extraversion and introversion largely reflect adaptation to social roles and communicative demands rather than priority sources of cognitive information. Similarly, the judging/perceiving and thinking/feeling dichotomies describe forms of decision-making and behavioral regulation that may vary substantially depending on situational context. At the same time, it should be

emphasized that the practical value of the MBTI in organizational settings is largely associated with its ability to capture current adaptive profiles, making it a convenient tool for team interaction and discussion of differences in work styles.

The distinction between natural and artificial specializations provides a correct framework for the comparative analysis of the CNS-B and the MBTI. Within this framework, the MBTI is regarded as a useful instrument in many contexts for describing the surface, behavioral level of individual differences, whereas the CNS-B defines a deeper level of analysis, making it possible to:

- Identify the neurophysiological foundations of psychological dichotomies;
- Explain typing instability and contextual variability of results;
- Differentiate between natural and adaptive forms of activity;
- Increase the precision of typological interpretation.

Thus, the distinction between natural and artificial specializations is a key methodological element enabling a rigorous and meaningful comparison of the CNS-B and the MBTI.

6. Comparative Analysis of the CNS-B and the MBTI

A comparative analysis of the CNS-B and the MBTI requires a clear methodological differentiation of the foundations on which the two models are built. Despite their external similarity, use of dichotomies and formation of typological configurations, the CNS-B and the MBTI pertain to different levels of analysis of individual differences and address fundamentally different research objectives.

The MBTI represents a phenomenological typology aimed at describing subjective preferences and stable behavioral styles. The CNS-B, by contrast, is a neurophysiologically oriented model describing the basic organization of activity and regulation. This distinction determines both the nature of the dichotomies employed and the interpretation of the resulting types.

In the MBTI, four dichotomies are used, each combining cognitive, regulatory, and behavioral aspects:

- Extraversion/introversion;
- Sensing/intuition;
- Thinking/feeling;
- Judging/perceiving.

In the CNS-B, the four dichotomies are differentiated based on functional grounds and grouped into two blocks: cognitive and functional-regulatory. The cognitive block includes the locus-related dichotomy internal/external (source of information) and the hemispheric dichotomy concrete/abstract (mode of information encoding). The functional-regulatory block includes the dynamic dichotomy of sympathetic/parasympathetic regulation and the vectorial dichotomy of afferent/efferent orientation.

6.1. Comparison of Dichotomies and their Poles

At first glance, the MBTI dichotomy extraversion/introversion appears analogous to the CNS-B locus-related dichotomy internal/external. However, closer analysis reveals fundamental differences. In the MBTI, extraversion and introversion are interpreted as preferred orientations of psychic energy, simultaneously associated with social activity, communication style, and motivational sources. In the CNS-B, the internal/external dichotomy describes the source of cognitive information and does not include social or behavioral characteristics. As a result, a single MBTI pole may encompass different neurophysiological modes, whereas in the CNS-B, each pole is unambiguously linked to interoceptive or exteroceptive regulation.

The MBTI dichotomy, sensing/intuition, is conceptually close to the CNS-B hemispheric dichotomy concrete/abstract, yet methodological differences are again evident. In the MBTI, sensing and intuition are described as modes of perception but also include elements of cognitive style, temporal orientation, and even motivation. In the CNS-B, the concrete/abstract dichotomy strictly reflects the mode of information encoding, associated with priority right- or left-hemispheric processing. Thus, the

CNS-B allows the MBTI sensing/intuition dichotomy to be interpreted as a phenomenological reflection of a more fundamental cognitive parameter.

The MBTI dichotomies, thinking/feeling and judging/perceiving, have no direct analogues in the cognitive block of the CNS-B. Their content is closer to functional-regulatory parameters describing decision-making and activity control. From the CNS-B perspective, these dichotomies reflect combinations of regulatory dynamics, control orientation, and degree of voluntariness. The lack of clear differentiation of these parameters in the MBTI leads to the same regulatory modes manifesting through different dichotomous combinations, reducing the diagnostic stability of the model.

6.2. Comparison of Integral Natural Specializations and MBTI Types

Within the CNS-B framework, individual differences are analyzed at the level of integral modes of functioning, formed by the combination of a cognitive specialization and a regulatory regime. Each of the sixteen integral natural specializations reflects a stable mode of engaging in the full activity cycle and determines characteristic conditions for the execution of its phases.

The MBTI, by combining poles of four dichotomies, identifies 16 personality types described as stable profiles of preferences encompassing cognitive, emotional, and behavioral characteristics. These types are derived from self-report and behavioral indicators and thus capture phenomenological preference profiles. This allows only partial correspondence between MBTI types and CNS-B integral specializations. Such a comparison does not imply strict equivalence; rather, it serves as a tool for identifying the limits of applicability of the MBTI and for demonstrating differences in levels of analysis.

Table 2 presents all sixteen integral natural specializations of the CNS-B. For each specialization, the MBTI types most frequently phenomenologically associated with the given mode of functioning are indicated, along with comments explaining the nature of this correspondence or the reasons for its absence. It should be emphasized that Table 2 is constructed not as an identity table but as a functional correspondence table, which is fundamentally important from a methodological standpoint.

Table 2.

Integral Natural Specializations of the CNS-B and their representation in the MBTI.

No.	Integral Natural Specialization (CNS-B)	Corresponding MBTI types	Commentary
1.	Explorer-Melancholic	–	Characterized by orientation toward opportunity search under afferent and parasympathetic regulation. The search process is internal and reflexive, weakly expressed behaviorally, and therefore not represented in the MBTI.
2.	Explorer-Phlegmatic	–	Search activity is stable and inertial, oriented toward gradual accumulation of information. Due to low behavioral expressiveness, this specialization is poorly captured by MBTI diagnostics.
3.	Explorer-Sanguine	ENTP, ESFP	Search is externally oriented and accompanied by high activity and exploratory behavior, phenomenologically well represented in MBTI due to pronounced behavioral patterns.
4.	Explorer-Choleric	ENFP	Search under mobilization and efferent regulation. Characterized by high initiative and active exploration of new opportunities; clearly distinguishable phenomenologically.
5.	Analyst-Melancholic	INTP	Analytical activity under inhibitory and afferent regulation. Characterized by deep reflection and internal logical processing; partially represented in MBTI.
6.	Analyst-Phlegmatic	ISTJ	Analysis under stable regulation. Characterized by systematicity, consistency, and focus on structure, well represented in MBTI due to stable behavioral patterns.
7.	Analyst-Sanguine	ISTP	Analysis oriented toward the current situation and accompanied by active interaction with the external environment. Phenomenologically distinguishable due to practical orientation.

8.	Analyst-Choleric	ENTJ	Analysis under mobilization and efferent regulation, characterized by strategic orientation and managerial activity.
9.	Synthesizer-Melancholic	INFJ, INFP	Deep synthesis of meanings under inhibitory regulation. One integral specialization manifests in several phenomenological MBTI variants.
10.	Synthesizer-Phlegmatic	INTJ	Synthesis under stable regulation, characterized by strategic integration and structuring, is clearly identifiable in MBTI.
11.	Synthesizer-Sanguine	–	Synthesis accompanied by high variability and weak fixation. The behavioral profile is unstable and poorly encoded by MBTI dichotomies.
12.	Synthesizer-Choleric	ENFJ	Active synthesis and transmission of meanings under mobilizing regulation are well represented phenomenologically.
13.	Implementer-Melancholic	ISFP	Implementation with high sensitivity and afferent regulation, manifested through individualized forms of activity.
14.	Implementer-Phlegmatic	ISFJ	Implementation oriented toward maintaining stable norms and processes, well captured due to repetitive behavioral patterns.
15.	Implementer-Sanguine	ESFJ, ESTP	Active implementation with pronounced social or situational orientation; behaviorally salient.
16.	Implementer-Choleric	ESTJ	Implementation under mobilization and efferent regulation, characterized by directive action and control of processes.

An analysis of Table 2 shows that the correspondence between the integral natural specializations of the CNS-B and MBTI types is ambiguous and asymmetric. In some cases, a single integral specialization corresponds to two MBTI types, reflecting the phenomenological diversity of manifestations of the same functional mode. In other cases, an integral specialization has no direct counterpart in the MBTI, indicating the limitations of this typology.

Integral specializations in the CNS-B must describe modes of functioning within the activity cycle, whereas MBTI types capture stable descriptive profiles. This makes a strict one-to-one correspondence between the two models impossible and underscores the difference in their theoretical foundations.

Table 3 presents the placement of MBTI types within the matrix of integral natural specializations.

Table 2.

Correspondence between cognitive specializations (CNS-B) and MBTI types.

Cognitive Specialization	Melancholic	Phlegmatic	Sanguine	Choleric
Explorer	–	–	ENTP, ESFP	ENFP
Analyst	INTP	ISTJ	ISTP	ENTJ
Synthesizer	INFJ, INFP	INTJ	–	ENFJ
Implementer	ISFP	ISFJ	ESFJ, ESTP	ESTJ

The incomplete coverage of integral natural specializations by the MBTI is caused by a number of fundamental reasons.

First, the MBTI does not include an independent dimension describing regulatory modes of activity. Differences between melancholic, phlegmatic, sanguine, and choleric modes are either not represented in the MBTI at all or are reflected only indirectly through behavioral indicators, which leads to the "collapse" of multiple specializations into a single type.

Second, the MBTI is oriented toward the phenomenological fixation of preferences, which makes it insufficiently sensitive to specializations with low behavioral expressiveness. This is precisely why integral specializations such as Explorer-Melancholic or Synthesizer-Sanguine are virtually absent from the typology.

Third, the combinatorial principle underlying MBTI type formation does not presuppose the necessity of traversing the full activity cycle. As a result, MBTI types reflect stable configurations of preferences but do not encompass all functionally possible modes of cyclic activity.

Thus, the absence of certain integral specializations in the MBTI should be regarded not as a deficiency of the CNS-B classification but as an indicator of differences in levels of analysis and theoretical objectives of the two models.

7. Conclusion

The present study aimed to provide a theoretical substantiation of the Bimodal Classification of Natural Specializations and to conduct its systematic comparison with the MBTI as one of the most widespread dichotomous models of individual differences. The analysis demonstrated that the external similarity of these models, the use of dichotomies, and the formation of sixteen typological configurations, conceals fundamentally different methodological statuses and levels of analysis.

The MBTI belongs to phenomenological models and describes stable preferences and behavioral styles formed through upbringing, education, socialization, professional adaptation, and individual experience. Its practical relevance is determined by ease of interpretation and applicability in applied contexts. At the same time, MBTI dichotomies combine cognitive, regulatory, and behavioral parameters without differentiating analytical levels, which limits explanatory power and results in context-dependent variability and typing instability.

The CNS-B is based on a different approach. Within its framework, individual differences are interpreted as the result of preferential use of alternative cognitive and regulatory modes with neurophysiological foundations. Functional differentiation of dichotomies across levels of activity organization avoids parameter conflation and ensures ontological coherence.

The key methodological result of this work is the introduction and substantiation of the distinction between natural and artificial activity specializations. This distinction allows for a new interpretation of phenomena traditionally viewed within psychological typologies as diagnostic errors or model deficiencies. Within the context of the CNS-B, the instability of typing, the variability of behavioral manifestations, and the dependence of results on social and professional context are viewed as natural manifestations of adaptation and compensation when the demands of activity do not match the subject's natural specialization.

The comparative analysis demonstrated that many empirical findings and practical effects identified within the MBTI framework can be explained through more fundamental parameters described by the CNS-B. In this sense, the bimodal classification of natural specializations is not opposed to the MBTI but rather provides a theoretical foundation for refining and deepening the interpretation of its results. This relationship between the two models makes it possible to view the MBTI as an instrument of surface-level analysis, useful for solving applied tasks, and the CNS-B as a deep-level model oriented toward analyzing the energetic and regulatory efficiency of activity.

The scientific novelty of the study consists of the following provisions:

1. For the first time, dichotomous personality typologies are examined through the lens of a neurophysiologically grounded bimodal model of activity regulation.
2. The concept of natural specialization of activity is introduced and theoretically substantiated as a stable, energetically optimal mode of nervous system functioning.
3. A methodological differentiation between cognitive and functional-regulatory dichotomies is carried out, eliminating the conflation of analytical levels characteristic of the MBTI.
4. An interpretation of the MBTI is proposed as a model of activity that diagnoses both natural and artificial specializations without differentiating between them, rather than basic neurophysiological differences.
5. It is shown that typing instability and contextual variability of MBTI results have a lawful, functional nature.

The theoretical contribution of this work lies in the formation of a multilevel framework for the analysis of individual differences, in which psychological typologies, activity models, and neurophysiological parameters are related as interconnected but non-identical levels of description. The CNS-B may be regarded as one possible metatheoretical framework that allows dichotomous typologies to be systematized and interpreted from the standpoint of a neurophysiologically oriented analysis of activity.

The practical contribution of the study consists of the possibility of using the CNS-B to address problems of activity optimization, functional role design, reduction of energetic costs, and prevention of

professional burnout. The differentiation between natural and artificial specializations makes it possible to increase diagnostic validity by avoiding the erroneous interpretation of adaptive strategies as stable personality traits.

The present study is theoretical in nature, which determines its limitations. At the same time, the CNS-B possesses substantial potential for empirical operationalization. Promising directions include:

- The use of psychophysiological indicators of autonomic regulation (heart rate variability, indices of sympathetic–parasympathetic balance).
- Analysis of functional asymmetry and activation dynamics during cognitive task performance.
- Development of combined diagnostic procedures incorporating behavioral indicators of stability, fatigability, and recovery.
- Comparison of CNS-B results with phenomenological typologies under conditions of longitudinal observation.

The limitations of the present study are primarily related to its theoretical character. The analysis is based on a conceptual comparison of models and requires further empirical validation. Promising directions for future research include the development of valid diagnostic procedures for identifying natural specializations, the study of their neurophysiological correlates, and testing the hypothesis that integral specializations exhibit greater stability than psychological types under long-term observation.

An additional direction for further research is associated with the practical application of the CNS-B in the fields of personnel management, organizational role design, and prevention of professional burnout. The use of the natural specialization model may contribute to a more precise matching between individuals and activities, a reduction in energetic costs, and an increase in the resilience of organizational systems under conditions of uncertainty and labor shortages.

Overall, the results of the study support the bimodal classification of natural specializations as a promising neurophysiologically grounded basis for analyzing dichotomous typologies. This approach can further develop the theory of individual differences and reconsider the role of dichotomous typologies in both scientific and applied contexts.

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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References

- [1] C. Jung, *Psychological types*. Princeton, New Jersey: Princeton University Press, 1971.
- [2] I. B. Myers, M. H. McCaulley, N. L. Quenk, and A. L. Hammer, *MBTI manual: A guide to the development and use of the Myers Briggs type indicator*. Palo Alto, CA, USA: Consulting Psychologists Press, 1998.
- [3] C.-L. Goo, M.-C. Leow, and L.-Y. Ong, "Analyzing course selection by MBTI personality types," *JOIV: International Journal on Informatics Visualization*, vol. 9, no. 1, pp. 29–37, 2025. <http://dx.doi.org/10.62527/joiv.9.1.2937>
- [4] R. U. Lubis, S. D. Harahap, and I. K. Siregar, "Understanding English speaking difficulties: MBTI personality types and psycholinguistics perspective among university students," *Indonesian Journal of English Education*, vol. 12, no. 2, pp. 273–284, 2025.
- [5] Q. Yu, S. Chen, X. Hou, and M. Ma, "Impact of MBTI on teaching effectiveness in internal medicine nursing: Teaching performance, teaching quality, and occupational identity," *Journal of Clinical and Nursing Research*, vol. 9, pp. 61–70, 2025.
- [6] Z. Zongyi, "Application analysis of MBTI occupational personality types in classroom group project teaching," *SHS Web of Conferences*, vol. 209, p. 01005, 2024. <https://doi.org/10.1051/shsconf/202420901005>

- [7] X. Liu, "A review of the application of MBTI personality theory in the field of personnel recruitment," *Cognitive and Behavioral Science Digest*, vol. 2, no. 1, pp. 1-6, 2026. <https://doi.org/10.63808/cbsd.v2i1.249>
- [8] H. W. Khan, M. U. Sattar, S. Noor, and M. I. Alyousef, "A personality-informed candidate recommendation framework for recruitment using MBTI typology," *Information*, vol. 16, no. 10, p. 863, 2025. <https://doi.org/10.3390/info16100863>
- [9] Y. Cai and Y. Pei, "Exploring the MBTI and the career field: How HR chooses the best talent based on personality," *International Theory and Practice in Humanities and Social Sciences*, vol. 2, no. 3, pp. 210-227, 2025. <https://doi.org/10.70693/itphss.v2i3.342>
- [10] R. R. Putri, A. S. Febriansyah, and S. N. Aisyah, "Understanding the MBTI personality test: An effective way to understand yourself and career potential," *Jurnal Ilmu Sosial dan Humaniora*, vol. 3, no. 2, pp. 64-71, 2025.
- [11] N. D. Putri, Z. N. A. Putri, N. A. Alvido, A. D. Rahmawati, and R. S. Dewi, "The effectiveness of the MBTI test on the success of the group counseling process," *GURUKU: Jurnal Pendidikan dan Sosial Humaniora*, vol. 3, no. 2, pp. 75-93, 2025. <https://doi.org/10.59061/guruku.v3i2.976>
- [12] N. Shaheen, A. Hussain, N. Ahmad, A. S. Jan, and N. U. Khan, "The entrepreneurial mindset: Leveraging MBTI to identify and nurture entrepreneurial potential," *Dialogue Social Science Review*, vol. 3, no. 6, pp. 433-443, 2025.
- [13] L. Bai, T. Wang, J. Tu, B. Peng, and Z. Wang, "A study on the correlation between MBTI dimensions and driving behavior characteristics," *Scientific Reports*, vol. 15, p. 12021, 2025. <https://doi.org/10.1038/s41598-025-91361-w>
- [14] T. Ma, K. Feng, Y. Rong, and K. Zhao, "From post to personality: Harnessing LLMs for MBTI prediction in social media," in *Proceedings of the 34th ACM International Conference on Information and Knowledge Management*, 2025.
- [15] Y. Zhang, "Analysis of the application of MBTI in society and the workplace," *Lecture Notes in Education Psychology and Public Media*, vol. 85, pp. 146-150, 2025. <https://doi.org/10.54254/2753-7048/2025.21314>
- [16] J. P. Williams and S. Wu, "The MBTI as a cultural meme, its diffusion on Chinese social media, and its significance for millennials' and Gen-Zs' selves and identities," *Symbolic Interaction*, 2025. <https://doi.org/10.1002/ymb.70012>
- [17] H. Lee and Y. Shin, "A study on MBTI perceptions in South Korea: Big data analysis from the perspective of applying MBTI to contribute to the sustainable growth of communities," *Sustainability*, vol. 16, no. 10, p. 4152, 2024. <https://doi.org/10.3390/su16104152>
- [18] J. S.-Y. Park, "Personality as technology of self: MBTI and English language learning in South Korea," *International Journal of the Sociology of Language*, vol. 2024, no. 285, pp. 35-54, 2024. <https://doi.org/10.1515/ijsl-2023-0035>
- [19] A. Hakim, S. H. Wijoyo, and N. Y. Setiawan, "Predicting K-Pop artists' MBTI personality types based on Instagram captions using Word2Vec and long-short term memory (LSTM)," *Jurnal Teknologi Informasi dan Ilmu Komputer*, vol. 10, no. 5, pp. 993-1002, 2023. <https://doi.org/10.25126/jtiik.2023107064>
- [20] G. J. Sippes, R. A. Alexander, and L. Friedt, "Item analysis of the Myers-Briggs type indicator," *Educational and Psychological Measurement*, vol. 45, no. 4, pp. 789-796, 1985. <https://doi.org/10.1177/0013164485454009>
- [21] D. J. Pittenger, "Cautionary comments regarding the Myers-Briggs type indicator," *Consulting Psychology Journal: Practice and Research*, vol. 57, no. 3, pp. 210-221, 2005.
- [22] J. E. Barbuto Jr, "A critique of the Myers-Briggs type indicator and its operationalization of Carl Jung's psychological types," *Psychological Reports*, vol. 80, no. 2, pp. 611-625, 1997. <https://doi.org/10.2466/pr0.1997.80.2.611>
- [23] T. Choi, "Criticisms and debates on MBTI: Focusing on validity-utility issues and psychosocial-societal issues," *Journal of the Korea Academy of Psychological Type*, vol. 26, no. 1, pp. 1-23, 2025. <https://doi.org/10.52745/KAPT.2025.26.1.1>
- [24] R. Zárate-Torres and J. C. Correa, "How good is the Myers-Briggs Type Indicator for predicting leadership-related behaviors?," *Frontiers in Psychology*, vol. 14, p. 940961, 2023. <https://doi.org/10.3389/fpsyg.2023.940961>
- [25] C. Siy, Y. Pang, K. Jung, and J. Kim, "One MBTI does not fit all: Perceptions and usage of MBTI in social media profiles," *Proceedings of the ACM on Human-Computer Interaction*, vol. 9, no. 7, pp. 1-29, 2025. <https://doi.org/10.1145/3757638>
- [26] E. Helmes, J. A. Schermer, and M. Fraboni, "Item format and social desirability: Implications for interpretation of the Myers-Briggs type indicator," *Psychology Research*, vol. 2, no. 6, pp. 361-368, 2012.
- [27] H. Liu, "Dispelling MBTI superstition: A study on the dialectical use of MBTI from the perspective of social use," *Communications in Humanities Research*, vol. 63, pp. 136-140, 2024.
- [28] R. Stein and A. B. Swan, "Evaluating the validity of Myers-Briggs Type Indicator theory: A teaching tool and window into intuitive psychology," *Social and Personality Psychology Compass*, vol. 13, no. 2, p. e12434, 2019. <https://doi.org/10.1111/spc3.12434>
- [29] M. Haryanti and Y. Margaretha, "The effectiveness of using MBTI as a benchmark for employee acceptance," *Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi*, vol. 8, no. 3, pp. 932-946, 2024.
- [30] A. Ishkov, "Classification of natural specializations of workers based on a bimodal model of activity," *Economics and Management: Problems, Solutions*, vol. 3, no. 1, pp. 6-18, 2026.
- [31] A. D. Ishkov, "Binary-differentiated approach in personnel management: The main provisions of the theory of natural specialization," *Leadership and Management*, vol. 12, no. 9, pp. 1901-1924, 2025. <https://doi.org/10.18334/lim.12.9.123809>

- [32] W. Ruch, "Pavlov's types of nervous system, Eysenck's typology and the Hippocrates-Galen temperaments: An empirical examination of the asserted correspondence of three temperament typologies," *Personality and Individual Differences*, vol. 13, no. 12, pp. 1259-1271, 1992. [https://doi.org/10.1016/0191-8869\(92\)90168-O](https://doi.org/10.1016/0191-8869(92)90168-O)