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Temperament as A Predictor of Medical Specialty Choice Among Senior-Year Students

Umarova D.
Tashkent State Medical University, Faculty of Fundamental Medicine, Uzbekistan

Dekhkambaeva Z. A.
Department of Pedagogy and Psychology, Tashkent, Uzbekistan

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Abstract

The choice of clinical specialty by senior (5th-6th year) medical students is one of the pivotal career decisions shaping a physician's professional trajectory, job satisfaction, and burnout risk. Alongside academic performance, prestige, income, and clinical-rotation experience, stable individual psychological characteristics — temperament in particular — are receiving growing research attention. To synthesise current views on the role of temperament in medical specialty choice and to propose a conceptual model mapping temperament profiles onto groups of medical specialties for senior-year students.

A theoretical-analytical literature review of classical temperament typologies, Cloninger's psychobiological model of temperament and character (TCI), and empirical studies on the association of personality traits with specialty choice in medical students and residents. Classical temperament types can be operationalised through measurable neurodynamic dimensions (novelty seeking, harm avoidance, reward dependence, persistence). A four-component model is proposed linking temperament profiles to broad specialty clusters: high-activity/impulsive profiles gravitate toward surgery and emergency medicine; stable-persistent profiles toward diagnostic and laboratory disciplines; sociable-affiliative profiles toward primary care; and sensitive-reflective profiles toward psychiatry and care of vulnerable populations. Temperament is a meaningful but non-deterministic factor in specialty choice. Incorporating it into career guidance for graduates may improve person-profession congruence, job satisfaction, and reduce burnout.

Keywords: Temperament; specialty choice; medical students; senior years; Cloninger's psychobiological model; career guidance; person-profession congruence; professional burnout.

Introduction

The choice of a medical specialty represents one of the most significant crossroads in the professional biography of a future physician. This decision, made primarily during final years and at the beginning of postgraduate training, influences not only the physician's career path but also their quality of life, professional fulfillment, and social prospects. The literature unanimously describes this decision as a multifactorial and dynamic process, intertwining academic performance, standardized examination results, prestige and expected income, clinical rotation experience, and the subjective sense of "compatibility" with future colleagues.

At the same time, growing evidence suggests that, all other things being equal, stable individual psychological characteristics—primarily temperament—make an independent contribution to the direction of a physician's professional choice. Temperament, understood as a natural, biologically determined basis for the dynamics of mental activity, determines the pace of response, emotional tone, tolerance of uncertainty and stress, and the predisposition to certain modes of interaction with the environment. These parameters largely determine which professional niche a person will thrive in and which will lead to chronic stress.

The relevance of this topic is heightened by the contemporary problem of physician burnout. A mismatch between a specialist's natural inclinations and the requirements of their chosen discipline is considered a risk factor for emotional exhaustion, decreased job satisfaction,

and premature retirement. In this context, early and conscious matching of one's own temperamental profile with the nature of one's future career acquires not only academic but also applied, human resources, and management significance. Modern approaches to the organization of medical education and international experience in its methodology emphasize the need for individualized specialist training [11, 12].

This article aims to systematize theoretical concepts regarding the role of temperament in choosing a medical specialization and to propose a conceptual model linking temperamental profiles with broad groups of medical specialties for graduate students. To achieve the goal, the following tasks are solved: (1) to clarify the concept of temperament and its operationalization; (2) to consider the specifics of the situation of choosing a specialization in the final years; (3) to generalize empirical data on the relationship between personality traits and specialization; (4) to formulate a conceptual model and practical recommendations; (5) to outline the limitations and a program for future empirical verification.

Methods

This study is a theoretical-analytical (narrative) review. The following sources were used: classic works on the psychology of temperament and nervous system typology; works describing Cloninger's psychobiological model of temperament and character and the corresponding TCI questionnaire; and empirical studies and reviews devoted to the relationship between personality traits and temperament profiles and the choice of medical specialty in students and residents. The sources were analyzed by thematic blocks, followed by synthesis and construction of the author's conceptual model. The work is theoretical in nature; the presented model is a hypothetical-deductive construct that requires empirical testing on a sample of graduate students (see Section 7).

Temperament: From Classical Typology to Measurable Dimensions

Temperament is the set of natural properties of the nervous system that determine the dynamics of mental processes: the speed and strength of reactions, the intensity of emotions, the stability of attention, and preferred behavior patterns. The classical typology, rooted in the humoral tradition and codified in the works of I.P. Pavlov, identifies four types:

•Sanguine: high activity, quick reactions, emotional stability, flexibility;

•Choleric: high reaction speed, pronounced emotionality, impulsiveness, energy;

•Phlegmatic: slowness, stability, calmness, behavioral stability, tolerance of monotony;

•Melancholic: high sensitivity, emotional depth, reflexivity, tendency to fatigue.

It is fundamentally important that temperament does not determine the content of activity or the level of ability, but it does set its pace, emotional tone, and style. This is especially important when choosing an environment in which a person's natural dynamics are most productively realized. At the same time, temperament does not determine the level of ability: their development is mediated by the educational environment, motivation, and targeted pedagogical work [13, 14].

A limitation of the classical four-type model is its descriptive nature and weak operationalizability. Modern personality psychology offers measurable dimensional models. Cloninger's psychobiological model, implemented in the Temperament and Character Inventory (TCI), has proven most productive for the medical context. The model identifies four independently inherited, early-emergent dimensions of temperament:

1. Novelty Seeking (NS) – a desire for new stimuli, impulsiveness; associated with dopaminergic activity;

2. Harm Avoidance (HA) – anxiety, caution, fatigue; associated with the serotonergic system;

3. Reward Dependence (RD) – sensitivity to social approval, attachment; associated with the noradrenergic system;

4. Persistence (PS) – persistence in activity despite fatigue and the lack of reinforcement.

Additionally, the model describes three personality dimensions that mature with age: Self-Directedness (SD), Cooperativeness (CO), and Self-Transcendence (ST). The dimensional approach does not abolish, but rather refines, the classical types and allows for their reformulation in verifiable terms. A rough mapping, used below as a working operationalization, is presented in the table 1.

Table 1. Working comparison of classical temperament types with TCI dimensions

Classic type	Dominant TCI Dimensions	Behavioral characteristics
Choleric	High NS, Low HA	impulsiveness, energy, propensity for leadership and risk-taking
Sanguine	High NS, High RD, Low HA	sociability, flexibility, people-oriented
Phlegmatic	High PS, Low NS, Low HA	persistence, methodicalness, tolerance of routine
Melancholic	High HA, High RD	sensitivity, reflexivity, empathy

Note: The comparison is indicative and is intended to construct testable hypotheses, not to provide a rigid classification.

Specifics of Choosing a Specialization in the Final Years

By the time of their final years, medical students have significant clinical experience gained during rotations and are moving from an abstract concept of the profession to a concrete decision. This stage has several characteristics that enhance the role of temperament.

First, by the time they graduate, characterological dimensions (self-directedness, cooperativeness) are largely formed, while temperamental dimensions are stable from an early age. Consequently, the choice is made on a relatively stable psychodynamic foundation, which enhances the predictive value of temperament at this stage.

Second, clinical rotations act as a natural "try-on" mechanism: the student empirically compares the demands of the discipline with their response style. The surgical operating room, the emergency room, the pathology lab, and the psychiatric office all place fundamentally different demands on pace, tolerance of uncertainty, the need for social interaction, and tolerance of routine. Third, decisions are made under conditions of high cognitive and emotional stress and competition for residency positions, which highlights individual differences in stress tolerance—a parameter closely related to harm aversion.

Empirical data on the relationship between temperament and specialty choice

The accumulated body of research, primarily using the TCI questionnaire, demonstrates consistent, albeit heterogeneous, associations between personality profiles and choice orientation.

Surgical and "active" specialties. Students choosing surgery, emergency medicine, and obstetrics and gynecology systematically exhibit higher levels of novelty seeking. Future surgeons are also characterized by lower harm aversion and reward dependence, which corresponds to the profile of a decisive, risk-tolerant, and technically oriented specialist. In the terms of this study, this profile is close to choleric.

Primary care and patient-oriented specialties. Students choosing primary care, emergency medicine, and obstetrics and gynecology demonstrate a high reward dependence, with the highest values characteristic of future pediatricians. A high RD reflects a pronounced orientation toward people and a need for warm interpersonal connections—which correlates with sanguine and, to some extent, melancholic profiles.

Cluster portrait of residents. One of the most revealing studies on a sample of residents identified five stable personality clusters and compared them with disciplines: "research" residents more often chose pathology and internal medicine; "team" residents chose general surgery; "rescue" residents chose emergency medicine; "reliable" residents chose pediatrics; and "compassionate" residents chose psychiatry. This distribution aligns well with the four-component model proposed below.

A significant caveat. While the relationships are statistically significant, the relationships themselves remain complex and probabilistic: representatives of each profile are found in different disciplines, and within each specialty, there is significant variability across profiles. Moreover, a study of residents showed that life satisfaction is more strongly associated with self-directedness than with personality-specialty congruence per se. A large-scale review highlights the methodological weaknesses of the evidence base—the predominance of cross-sectional designs, heterogeneity of instruments, and insufficient description of psychometric properties. These facts provide a framework for cautious interpretation of the model.

Conceptual Model: Temperamental Profiles and Groups of Specialties

Based on a synthesis of the presented data, a four-component conceptual model is proposed linking temperamental profiles (in their classical designations and dimensional operationalization) with broad groups of medical specialties. The model does not prescribe a choice, but serves as a tool for reflection and career guidance dialogue.

6.1. The "Action and Risk" Profile (Choleric; high NS, low HA). This profile gravitates toward specialties that require quick decisions, tolerance of uncertainty, and intense workloads: surgery and its subspecialties, traumatology, emergency medicine, anesthesiology and resuscitation. Strengths include decisiveness, performance under pressure, and leadership potential. Risk areas include impulsiveness, emotional overload, and difficulties with long-term planning.

6.2. The "Precision and Endurance" Profile (Phlegmatic; high PS, low NS). Gravitates toward diagnostic, laboratory, and analytical disciplines that value sustained attention and methodical approach to monotonous work: pathomorphology, laboratory diagnostics, radiology, a number of areas of internal medicine, and medical genetics. Strengths include accuracy, stability, and tolerance for routine. Risk areas include inertia in rapidly changing conditions.

6.3. Contact and Response Profile (Sanguine; high NS and RD, low HA). Gravitates toward primary and general care specialties with intense interpersonal interaction: family and general practice, pediatrics, obstetrics and gynecology, and outpatient therapy. Strengths include communication skills, flexibility, and the ability to maintain patient trust. Risk areas include superficiality and restlessness in highly specialized work.

6.4. Sensitivity and Reflection Profile (Melancholic; high HA and RD). She gravitates toward disciplines that emphasize empathy, observation, and emotional recognition: psychiatry, psychotherapy, palliative care, rehabilitation, and working with vulnerable groups. Her strengths include deep analytical skills and sensitivity to quality and the patient's condition. Risks include increased vulnerability to stress and burnout; a supportive

professional environment is crucial.

Table 2. Conceptual comparison of temperamental profiles with groups of specialties

Profile (Type / Dimensions)	Focused specialties	Key Resources	Risk zones
Action and Risk (Choleric; ↑NS, ↓HA)	Surgery, traumatology, emergency medicine, anesthesiology and resuscitation	Determination, work under pressure	impulsivity, overload
Precision and Endurance (Phlegmatic; ↑PS, ↓NS)	Pathology, laboratory and radiation diagnostics, genetics	Methodical, resilience	inertia in the face of change
Contact and Response (Sanguine; ↑NS, ↑RD)	Family medicine, pediatrics, obstetrics and gynecology	Communication skills, flexibility	superficiality
Sensitivity and Reflection (Melancholic; ↑HA, ↑RD)	Psychiatry, psychotherapy, palliative care, rehabilitation	Empathy, observation	vulnerability to burnout

Practical Implications and Empirical Verification Program

1. Recommendations for a Career Guidance System

Considering temperament in work with graduates can be integrated into career counseling without the risk of determinism, provided a number of principles are observed. It is advisable to view the temperament profile as a starting point for reflection, rather than as a suitability filter. Career guidance dialogue should be based on comparing the student's natural dynamics with the actual requirements of the disciplines clarified during rotations. Particular attention should be paid to students with a high harm aversion profile who choose high-stress specialties: they are recommended to develop self-regulation and stress-resilience skills early. Since job satisfaction is more strongly associated with self-direction than with formal congruence, the development of characterological resources should accompany any career guidance work [14]. The holistic development of a future specialist also requires maintaining psychophysical resources through physical education and sports [15].

2. Empirical Model Validation Program

The proposed model requires verification. A longitudinal design using a cohort of graduating students is advisable: entrance testing using a validated version of the TCI, recording specialization preferences and selection factors, and then tracking actual distribution across residency positions. The analysis involves clustering temperament profiles and testing their associations with specialization groups while controlling for gender, academic performance, and sociodemographic variables, as well as assessing the profile-specialization congruence as a predictor of satisfaction and burnout in the early stages of residency. Standardization of instruments and a sufficient sample size will overcome the methodological limitations of previous cross-sectional studies.

Limitations

This work is theoretical and analytical in nature; the proposed model has not been verified using its own empirical data and relies on a synthesis of diverse sources. The comparison of classical temperament types with the TCI dimensions is a simplification and serves didactic and heuristic purposes. The evidence base for the relationship between personality and specialty choice is generally assessed as moderate due to the predominance of cross-sectional designs and the heterogeneity of methods. Finally, the choice of specialty is determined by numerous impersonal factors (economic conditions, job availability, gender and cultural expectations, and the organization of the healthcare system), which are not captured by the temperament model and should be considered in comprehensive studies.

Conclusion

Temperamental traits have a significant, but not decisive, influence on the choice of medical specialty among graduate students. Operationalizing classical temperament types through the measurable dimensions of Cloninger's psychobiological model allows for a transition from descriptive characteristics to testable hypotheses and is consistent with empirically identified personality profiles of representatives of various disciplines. The proposed four-component conceptual model links the profiles of "action and risk," "precision and endurance," "contact and response," and "sensitivity and reflection" with broad groups of specialties and can serve as a tool for career guidance reflection.

Temperament should be understood not as a limitation, but as a natural foundation that, with the conscious development of characterological resources, becomes a professional resource. Considering temperamental profiles in medical education and personnel policy can improve personality-professional congruence, job satisfaction, and reduce the risk of burnout—subject to further empirical testing of the model on longitudinal samples of graduates.

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