

Neurogenetic Psychometrics of Stress: A Multidimensional Framework for Intelligence, Personality, and Adaptability

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ABSTRACT

The human mind, with its vast capacities for thought, emotion, and action, has long been a subject of profound fascination and scientific inquiry. Concepts such as "intelligence" and "personality" are woven into the fabric of our daily language, used to describe ourselves and others, to explain successes, and to understand failures. Yet, for much of history, these concepts remained in the realm of the abstract, accessible only through introspection and philosophical debate. The field of psychometrics represents a monumental shift in this understanding, providing the scientific framework to translate these abstract psychological constructs into tangible, measurable, and comparable data. The role of neurogenetic varna personality traits matrix has the entailed determination action of stress predispositions of humans that can relate epigenetics and stress influence over cognitive intelligence during the employee work settings and relatedness towards ancient varna system depicted in Manusmriti and Santana Dharmashastras. At its core, psychometrics is the science of psychological measurement. It encompasses the theory and techniques used to design, validate, and apply assessment tools that quantify individual differences in abilities, attitudes, and behavioural traits. This endeavour is not merely academic; it has profound and far-reaching practical implications. The scores derived from psychometric tests inform some of the most critical decisions in a person's life, from educational placement and clinical diagnosis to career selection and legal judgments. A well-constructed test can illuminate a path for a struggling student, help a clinician tailor a therapeutic intervention, or guide an organization in building a more effective team. Conversely, a poorly designed or improperly used test can lead to misunderstanding, bias, and significant harm. This report delves into the practical applications of psychometrics, focusing on the two most foundational and widely assessed domains of human individuality: intelligence and personality. It is structured into two comprehensive parts.

Keywords: intelligence, stress genes, neurogenetics, psycho genetics, personality mapping.

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INTRODUCTION

The Landscape of Human Intelligence, explores the multifaceted nature of cognitive ability. It traces the conceptual journey of intelligence from early theories of a single, general capacity to modern, pluralistic models that recognise a diverse array of cognitive and emotional skills. This part will examine the seminal theories of Spearman, Thurstone, Gardner, and Sternberg, and deconstruct the meaning and measurement of both the Intelligence Quotient (IQ) and the Emotional Quotient (EQ).

The Scientific Assessment of Personality, navigates the complex world of human character. It examines the major theoretical frameworks used to understand its structure, from the deep unconscious drives of psychoanalytic theory to the stable, measurable traits identified by pioneers like Cattell and Eysenck. This part will also explore the diverse psychometric tools developed to measure personality, from structured, objective questionnaires to ambiguous, projective techniques.

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Throughout this report, the theoretical discussions are grounded in real-world application. Through detailed examples and illustrative case studies, we will see how these psychometric tools are used in clinical, educational, organizational, and forensic settings to provide invaluable insights into the human condition. By bridging the gap between abstract theory and concrete practice, we can appreciate the immense power—and profound responsibility—that comes with the scientific measurement of the mind.

Literature review

The Landscape of Human Intelligence

The concept of intelligence is central to our understanding of human potential. It is the invisible engine that drives our ability to learn, reason, solve problems, and adapt to an ever-changing world. This section of the report embarks on an exploration of this complex construct, beginning with the fundamental challenge of defining it and tracing the evolution of its measurement. We will journey through the foundational theories that have shaped the field, from the idea of a single "general intelligence" to the modern recognition of multiple, diverse abilities. Finally, through applied case studies, we will witness how the measurement of intelligence provides critical insights that shape lives in educational and clinical contexts.

The Quest to Define Intelligence

Before we can measure a concept as profound as intelligence, we must first attempt to define it. This task has proven to be one of the most enduring challenges in psychology. Intelligence is not a physical object that can be seen or touched; it is a hypothetical construct—an abstract variable that is not directly observable but is inferred through its effects on behavior and performance on specific tasks. For over a century, scholars have proposed a multitude of definitions, each reflecting different theoretical perspectives and cultural values. Early in the 20th century, Lewis Terman, a key figure in intelligence testing, defined it as "the ability to carry on abstract thinking". David Wechsler, the creator of the most widely used intelligence tests today, offered a broader definition: "The aggregate or global capacity of an individual to act purposefully, think rationally and deal effectively with the environment". More contemporary theorists like Robert Sternberg have framed it as a "capacity for goal-directed adaptive behaviour," while Howard Gardner defines it as "the ability to solve problems or create products that are valued within one or more cultural settings". This

diversity of definitions underscores a critical point: intelligence is not a single, monolithic entity but a complex combination of higher-order cognitive skills, including reasoning, planning, problem-solving, and learning from experience.

The Cultural Lens

The very definition of intelligence is inextricably linked to cultural context. Western cultures have historically placed a high value on skills that can be objectively measured and are relevant to academic and industrial success, such as analytical reasoning, processing speed, and individual achievement. In contrast, other cultures may emphasize different facets of intelligence. For example, some Eastern cultures may place greater value on self-reflection, social harmony, and interpersonal wisdom, while certain indigenous cultures might prioritize practical skills, ecological knowledge, and the ability to navigate the natural environment. This cultural relativity is a crucial consideration in the development and application of intelligence tests, as a test developed in one cultural context may not be a valid measure of intelligence in another.

The Measurement-Definition Feedback Loop

The practical challenge of measuring intelligence has historically shaped its very definition, creating a powerful feedback loop. The earliest intelligence tests, pioneered by Alfred Binet, were not born from a grand, abstract theory of cognition. Instead, they were created to solve a practical problem: identifying French schoolchildren who required special educational assistance. Binet's test focused on skills crucial for academic success, such as memory, attention, and verbal reasoning. This pragmatic origin set a precedent. The skills that these early tests could successfully measure—analytical and verbal abilities—became the operational definition of intelligence itself.

This phenomenon was famously, and somewhat cynically, captured by the psychologist E.G. Boring, who declared, "Intelligence is what the tests test". This statement highlights a crucial reality: the tools of measurement did not just assess a pre-existing concept of intelligence; they actively constructed it. Because standardized tests were effective at quantifying logical-mathematical and linguistic skills, these abilities were elevated as the core of

"intelligence." Consequently, societal institutions, particularly schools, came to value and reward these specific skills above others. This created a cycle where

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the tests validated the school system's focus, and the school system prepared students for the tests.

The emergence of modern theories from figures like Gardner and Sternberg can be understood as a direct challenge to this test-driven paradigm. Their work represents a conscious effort to break the feedback loop by expanding the definition of intelligence to include abilities—such as creativity, practical problem-solving, and interpersonal skills—that are not easily captured by traditional psychometric instruments. They argue that a fuller, more authentic understanding of human intellect requires looking beyond the narrow band of abilities that happen to be the easiest to quantify.

Introducing IQ (Intelligence Quotient)

The most common metric used to quantify intelligence is the Intelligence Quotient (IQ). The concept was first proposed by German psychologist William Stern and later popularized by Lewis Terman in his 1916 adaptation of Binet's test, the Stanford-Binet Intelligence Scale. The original formula was a ratio designed to compare a child's intellectual development to their peers:

$$IQ = \left(\frac{\text{Mental Age (MA)}}{\text{Chronological Age (CA)}}\right) \times 100$$

Here, "Mental Age" represented the age level at which an individual was functioning intellectually. For example, a 10-year-old child who performed at the level of an average 12-year-old would have an MA of 12 and an IQ of 120 ($12/10 \times 100$).

While this ratio IQ was intuitive, it proved problematic for assessing adults, as cognitive development does not progress linearly throughout the lifespan. Modern intelligence tests, such as the Wechsler scales, have replaced the ratio IQ with a deviation IQ. This score is calculated by comparing an individual's performance to the average performance of a large, representative standardization sample of their same-age peers. The scores are statistically transformed to fit a normal distribution, or "bell curve," with a pre-set mean of 100 and a standard deviation of 15.

This allows for a standardized interpretation of scores across all age groups.

The table below shows the standard classification of IQ scores used in most modern tests.

IQ Score Range	Classification
130 and above	Very Superior (Gifted)
120–129	Superior
110–119	High Average

IQ Score Range	Classification
90–109	Average
80–89	Low Average
70–79	Borderline
Below 70	Extremely Low / Intellectual Disability

(Source: Adapted from)

Introducing EQ (Emotional Quotient)

In recent decades, the concept of Emotional Quotient (EQ), also known as Emotional Intelligence (EI), has gained widespread prominence as a vital complement to traditional cognitive intelligence. Popularized by science journalist and psychologist Daniel Goleman in his 1995 book, EQ is defined as the ability to perceive, understand, manage, and utilize emotions effectively in oneself and in relationships with others.

Goleman's model proposes five key components of emotional intelligence :

1. **Self-Awareness:** The ability to recognize and understand one's own moods, emotions, and drives, as well as their effect on others.
2. **Self-Regulation:** The ability to control or redirect disruptive impulses and moods and to think before acting.
3. **Motivation:** A passion to work for reasons that go beyond money or status; a propensity to pursue goals with energy and persistence.
4. **Empathy:** The ability to understand the emotional makeup of other people and to treat people according to their emotional reactions.
5. **Social Skills:** Proficiency in managing relationships, building networks, and finding common ground.

While IQ is often seen as a predictor of academic success and technical proficiency, EQ is increasingly recognized as a critical factor in life success, leadership effectiveness, and overall well-being. It governs our ability to navigate complex social landscapes, build strong relationships, and manage the pressures of life with resilience and grace.

VARNA SYSTEM AND HUMAN TAXAMONY

The culture has been followed and transferred to our generation in the form of VEDAS, by Aryans. We are Aryans. Vedas is one of the oldest forms of methodology to follow in Indian culture. The Vedic culture is considered to be the basic foundation of cultures in India.

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People have been classified based on their physical, spiritual, way of living and color. One of the popular epics all over the world where Indian cultures have been portrayed is Ramayana, Mahabharata, and Panchatantra. The Vedas are broadly classified into three names, the Rig Veda, Sama Veda, and Yajur Veda in short, they are termed GURUS. The people who follow the Vedic culture are termed Brahmins. Brahmins are treated with Vedas in school and education. The four Varna's of Indian cultures are

Brahmins-They are considered to be the intellectual leaders, teachers, priests in the temple where the god lives, people who learn Vedas, teach Vedas and follow the sacred rules based on Manu smriti with the goal of transferring the sacred knowledge to Brahmins from one generation to another specifically

Aryans. Their day today activities will be towards serving god and human kind and help everyone to attain the highest form of living known as moksha the liberation from human kind and attaining god by following the Vedic rules and doing karmic actions. They use their mind in each task and perform the work smartly and they seem to be intelligent by birth that has been transferred to them through blood and genes from ancestors.

Kshatriyas-They are treated as the most powerful persons in the societies where they do take up the most influencing positions and leadership positions to implement the various dharmas to human kind by being highly authoritative they do have occupations such as social leaders, politicians, the protectors of Brahmins etc, they usually do the activities using hands

Vaishyas- they are people who do have the activities such as agriculture and Labour activities such as mining, carving etc. these are the people who work with stomach and legs and reasons for providing food to entire society that includes farmers and potters

Sudras – people who serve the other three caste listed above are treated as shudras and any one who are not skilled with any talent and those who clean the toilets are considered to be shudras

Dalits: Any person's who doesn't belong to any of the caste above is considered to be Dalits and anyone who does actions against the Vedic laws from the Varna system are thrown out called as Dalits, any outcaste and religions other than Hinduism is termed as Dalits who are impure by birth and actions. Manu seems to be a book that has been the foundation to Law drafted by Brahma and

transferred that knowledge to 7 Rishi namely, **Kashyapa, Atri, Vashista, Vishwamitra, Gautama, Bharadvaja, Jamadagni**.

Manu smriti -a holy guideline book of laws that need to be followed by all human beings in Hinduism - created by Brahma. Brahma god is creator of all humankind, the god who distinguished the set of rules and regulations the human of Hinduism should follow and abide it where the concerned punishment will be awarded if not following it.

Determination of western related human classification could help us to develop a sense of how the culture of human resource management has been derived and adopted. In order to develop a strategy of ethics towards employee behaviour in improving efficiency in work based on global professional environment. In brief we could state that it's always a group of humans who represent the culture foundation in the city or country that denotes the basic functionality of the government and law-making policy in that concerned country, people in the country represent the state and culture of human resource. The basic eastern system of classification of humans are explained in terms of Taxonomy of humans that can be explained in terms of origin of humans from animals and evolution of animals.

The hierarchy of human's evolution in eastern culture includes

- Domain
 - Kingdom animalia
 - Phylum
 - Class
 - Order
 - Family
 - Genus
 - Species-Homo sapiens
- IN western human resource culture, they do follow Christianity, and the human taxonomy do follow the aspect of origin of humans from animals and the current state of humans includes homosapiens and emergence of human to adhere the principle and methodology of Jesus and follow bible. Thus, the important aspect to consider both eastern and western management system is the ethics and aspect of the way human tradition and culture follows and exile in their respective religion and culture

In this research two dimensions of research methodology has been adopted one is structured interview where target

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doctors, lawyers, neurologists where interviews regarding other outlook in adoption of the Neurogenetic profiling in corporate companies and based on their perspective the research methodology 2 has been adopted which indulge in creating an universal Neurogenetic varna cognitive persists mapping that can provide insights regarding job suitable description of all employees based on their skills and psychometric in terms of intelligence and stress calculation with big 5 model and intelligence scale Methods has been adopted.

Research methodology 1

In this research the research methodology adopted in structures interview where 15 experts such as neurologists, psychologists, lawyers and employees are being interviewee and the basic response from them is being considered to be idealised to arrive at decision making in adoption of neurogenic profiling in Arena industries , this based on the response obtained the further method that has been adopted in this research is analysis go the employees in the arena industries to adopt the Neurogenetic testing profiling in their company report has been detailed and analysed .

Structured interview analysis

From a legal and policy standpoint, India currently relies on fragmented protections under the Mental Healthcare Act (2017), ICMR guidelines, and the Digital Personal Data Protection Act (2023). Unlike the U.S., which has the Genetic Information Nondiscrimination Act (GINA, 2008), India lacks a dedicated neuro-genetic regulatory framework. This leaves a significant gap in safeguarding employees against genetic discrimination and ensuring ethical use of genomic data in health and HR settings.

The aim of this interview is to explore your perspective as a genetic expert on how neurogenetics can inform stress management, particularly for women, and what role law, ethics, and medical practice should play in shaping responsible policies.

Scientific & Clinical Dimension

Q1. How do COMT, NR3C1, BDNF, and FKBP5 interact with chronic workplace stress in women?

1	COMT, NR3C1, BDNF, and FKBP5 together shape how women process and recover from stress. COMT regulates dopamine breakdown, NR3C1 modulates cortisol feedback, BDNF supports neuroplasticity, and FKBP5 affects stress hormone sensitivity—together
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	influencing resilience or vulnerability under chronic workplace pressure.
2	In women, hormonal cycles interact with these genes, amplifying the stress response. For instance, lower COMT activity combined with estrogen fluctuations can heighten anxiety and emotional reactivity in high-stress occupations.
3	Two women with identical stressors but different gene variants would respond differently: one with a resilient NR3C1 expression may recover quickly, while another with hyperactive FKBP5 could experience prolonged cortisol elevation and burnout.
4	BDNF polymorphisms can alter neuroplasticity and emotional recovery. Women carrying the Met allele may have slower mood stabilization after stress compared to those with the Val allele, even when exposed to the same environment.
5	Epigenetic interventions like demethylation therapy or mindfulness-based stress reduction can partially reverse NR3C1 and BDNF methylation, enhancing emotional regulation and improving resilience in chronically stressed individuals.
6	However, such interventions must be approached cautiously. While epigenetic modulation shows promise, it should complement—not replace—psychological counseling and workplace wellness programs.
7	Integrating epigenetic therapy into preventive occupational health could be beneficial, but only if ethical oversight and informed consent are guaranteed. Otherwise, it risks becoming a form of biological surveillance.
8	Preventive use of genetic or epigenetic tools should focus on empowerment. For example, identifying vulnerable individuals can allow early stress-management programs, yoga, or nutrition adjustments rather than pharmaceutical dependence.
9	Chronic stress in women often interacts with social factors—workload inequity, gender bias, and caregiving roles—that magnify gene expression effects. Hence, interventions must address both biology and environment together.
10	Overall, neurogenetic understanding should guide public health and occupational policies to personalize stress prevention, improve women’s

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	mental well-being, and foster inclusive, psychologically safe workplaces.
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Q2. How reliable are current genome profiling tools in predicting stress resilience?

R1	Current genome profiling tools offer valuable insights into stress resilience, but their predictive reliability remains moderate. Genetics explains predisposition, not behavior, and must be integrated with psychological and environmental data for accuracy.
R2	qPCR remains the most actionable for identifying specific variants in stress-linked genes like BDNF, FKBP5, and NR3C1. It provides clear, reproducible results and is cost-effective for small, targeted studies.
R3	Transcriptomic tools provide broader system-level insight, revealing how stress genes are expressed under pressure, but variability due to timing and environment limits clinical precision.
R4	Microarrays are useful for research screening of multiple loci but produce more false positives, making them less suitable for individual assessments of stress resilience.
R5	False positives are managed through replication, population-specific validation, and cross-referencing with behavioral markers. Genetic counseling ensures that findings are interpreted probabilistically, not deterministically.
R6	Combining genome data with psychometric evaluations and biomarkers such as cortisol levels increases predictive value and reduces misclassification.
R7	Employers should not treat genetic risk scores as equivalent to psychometric tests. The latter measure present coping capacity, while the former indicate biological tendencies.
R8	Ethical use of these tools requires that they inform support programs, not screening or hiring decisions. Misinterpretation of risk scores could lead to discrimination and stigma.
R9	For occupational applications, small-scale pilot studies and anonymized group-level data are more appropriate than individual testing to protect privacy.

R10	In summary, genome profiling is an emerging supplement not a replacement for psychological assessment. When interpreted responsibly, it enhances personalized stress management but should never define employability or worth.
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Q3. Can genetic testing be used preventively for burnout detection?

R1: Current genome profiling tools offer promising but still limited insight into stress resilience, as they identify variants linked to cortisol regulation, synaptic plasticity, and emotional stability without fully accounting for gene environment interactions. Among the available methods, qPCR provides the most actionable results for targeted stress-linked genes such as BDNF, NR3C1, and FKBP5 due to its precision and sensitivity, while transcriptomic and microarray approaches offer broader but less practical data for routine assessment. False positives remain a concern, best managed through population-specific baselines, multimodal validation, and careful genetic counseling that frames result as probabilistic rather than deterministic. Employers should not rely on genetic risk scores in the same way as psychometric tests, since the former reflect biological predispositions while the latter assess present coping and behavior; integrating both may be valuable for research, but genetic profiling alone is neither ethically sound nor reliable enough for employment-based decision-making.

R2: Yes, genetic testing holds preventive potential for burnout detection by identifying individuals with heightened stress sensitivity due to variations in genes like NR3C1, FKBP5, or COMT. Early awareness allows for targeted interventions such as resilience training, mindfulness programs, and personalized stress management. However, genetic results should complement not replace psychological assessments, as burnout is multifactorial, shaped by work environment, social support, and personal coping mechanisms rather than genetics alone.

R3: From my perspective, genetic testing can indeed play a preventive role in burnout detection if used responsibly. Certain genetic markers, such as FKBP5, BDNF, and NR3C1, are associated with how individuals regulate cortisol and recover from prolonged stress. Identifying these markers early could allow clinicians to design personalized stress

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management programs, combining lifestyle modification, counseling, and nutritional support to strengthen resilience before symptoms of burnout appear.

R4: That said, burnout is not solely determined by genetics; it emerges from the interaction between biological, psychological, and environmental factors. Even if someone carries a “stress-sensitive” genotype, supportive work conditions, healthy sleep patterns, and balanced workloads can offset those risks. Therefore, genetic testing should be integrated with mental health assessments and workplace well-being initiatives rather than used in isolation.

R5: I also believe the ethical framework around preventive genetic testing must be very clear. Participation should always be voluntary, and data should remain confidential, shared only between the individual and healthcare provider. Using such information for employment screening or insurance purposes would be deeply problematic. The aim of genetic testing in this context should be empowerment helping individuals understand their biological responses to stress rather than creating new forms of discrimination.

R6: In my view, preventive genetic testing could transform how we approach occupational mental health by shifting the focus from treatment to prediction and early care. If organizations partner with healthcare providers, employees who show genetic susceptibility to stress dysregulation could receive early support such as counseling, flexible schedules, or guided wellness programs. This proactive model could reduce long-term healthcare costs and absenteeism, fostering a healthier and more resilient workforce.

R7: it’s important to acknowledge that genes only indicate tendencies, not fixed outcomes. A person’s mindset, coping strategies, and environment often determine whether genetic risks actually translate into burnout. Hence, genetic testing should serve as a self-awareness tool rather than a predictive label. When combined with emotional intelligence training and mindfulness-based interventions, it can help individuals develop personalized strategies for managing stress.

R8: Another key aspect is education. Before implementing such preventive programs, organizations and healthcare professionals must ensure that employees understand what genetic results mean and, equally, what they do not. Misinterpretation could lead

to unnecessary anxiety or stigma. Transparent communication about limitations, potential benefits, and data protection builds trust and ensures that testing serves human well-being, not corporate metrics.

R9: Umm. the success of preventive genetic testing depends on multidisciplinary collaboration. Geneticists, psychologists, ethicists, and policymakers must work together to create a balanced framework that protects individual rights while promoting mental health. When applied with compassion, transparency, and respect for autonomy, genetic testing could become a valuable component of holistic burnout prevention in the modern workplace.

R10: From a clinical genetics standpoint, I believe preventive genetic testing for burnout should ultimately empower individuals to make informed lifestyle and career choices. If a person knows they have genetic variants associated with reduced stress tolerance or slower cortisol recovery, they can proactively adopt strategies such as structured rest cycles, cognitive-behavioral therapy, or mindfulness training. The aim is not to label someone as “vulnerable” but to promote personalized resilience and help individuals maintain long-term mental well-being in demanding work environments.

Psychological & Neurocognitive Angle

Q4. How might neuro-genetic profiling enhance HR interventions in high-stress industries?

R1: Neuro-genetic profiling could help HR teams design evidence-based stress management programs by identifying employees with higher biological sensitivity to stress, allowing targeted interventions for resilience and recovery.

R2: Yes, profiling could be integrated into resilience training, enabling personalized approaches where individuals learn coping mechanisms best suited to their genetic and neurochemical stress profiles.

R3: I do worry it may shift responsibility toward employees; hence, it should complement organizational reforms like workload balance and psychological safety, not replace them.

R4: To avoid fatalism, communication must focus on empowerment emphasizing that genes indicate tendencies, not destiny and that supportive environments can modify biological stress responses.

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R5: Neuro-genetic profiling can enhance HR strategies by identifying employees who may need additional support in high-pressure environments. When implemented ethically, it enables personalized wellness programs, early intervention for stress disorders, and improved employee retention. However, it must always prioritize consent, data privacy, and collaboration with mental health professionals to prevent misuse.

R6: Integrating neuro-genetic profiling into HR could reshape corporate wellness frameworks by merging biological insight with psychological care. This approach can tailor resilience workshops, optimize team dynamics, and reduce burnout. Yet, organizations must ensure the focus remains on collective well-being rather than using genetic data to label or segregate employees.

R7: Incorporating neuro-genetic profiling helps HR departments create balanced work environments through personalized coping plans. However, policies must ensure that profiling outcomes inform supportive interventions, not recruitment or performance decisions. Transparency, counseling, and strict confidentiality are essential so employees view this as empowerment, not surveillance, fostering trust in organizational health initiatives.

R8: Neuro-genetic profiling can guide HR departments to design wellness initiatives that match employees' biological stress responses, improving productivity and satisfaction. However, these insights should enhance empathy-driven management rather than justify stressful conditions or excessive performance expectations in high-pressure workplaces.

R9: When used with proper safeguards, neuro-genetic data can bridge the gap between neuroscience and corporate psychology, helping HR leaders identify burnout risk patterns and create targeted prevention strategies. This scientific integration must operate under transparent ethical standards to gain employee trust and ensure fairness.

R10: In my opinion, neuro-genetic profiling is valuable only when it promotes human-centered leadership. It should encourage organizations to invest in supportive cultures and mental health resources rather than viewing genetic information as a control mechanism. Respect for autonomy and dignity must remain at the heart of every application.

Q5. Could mapping SLC6A4 and CRHR1 enable personalized wellness plans?

R1: Mapping SLC6A4 and CRHR1 can indeed guide personalized wellness plans by revealing variations that affect serotonin transport and cortisol regulation. These insights can help design customized interventions such as mindfulness, dietary adjustments, or pharmacogenetic approaches that support emotional stability and stress recovery.

R2: To prevent misuse, strict data governance policies and legal safeguards must be in place. Employers should be prohibited from accessing genetic results during hiring or promotion decisions, with independent oversight ensuring that data is used solely for voluntary health improvement.

R3: Such sensitive genetic data should remain private and under medical supervision, not stored in general employee health records. Confidentiality builds trust, allowing individuals to benefit from genetic insights without fear of discrimination or exposure.

R4: Personalized stress management can unintentionally widen workplace inequality if only higher-level employees receive genetic wellness benefits. Equity policies must ensure all workers regardless of role or status have access to mental health resources and preventive care.

R5: Mapping these genes empowers early stress detection, allowing interventions tailored to biological predispositions. However, any workplace implementation must adhere to bioethical standards, protecting autonomy and ensuring employees' right to refuse testing without career repercussions.

R6: Employers should adopt a non-interference policy, where genetic data belongs exclusively to the individual. This separation between personal medical data and corporate management practices is crucial to maintaining ethical integrity.

R7: If wellness programs use genetic data, organizations must apply de-identification techniques and involve medical professionals rather than HR teams in handling results, ensuring the information cannot be traced back to specific individuals.

R8: While genetic mapping offers potential for personalized resilience plans, the communication strategy around such testing must emphasize empowerment, not vulnerability. Employees should view these results as tools for personal growth, not as biological limitations.

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R9: To maintain fairness, government or regulatory bodies should develop national guidelines for workplace genetic data use, defining what information can be collected, how it is stored, and how long it may be retained.

R10: mapping SLC6A4 and CRHR1 should serve as a wellness-enhancing initiative, not a performance measure. Ethical frameworks, counseling support, and transparent consent processes ensure that science benefits employees without compromising dignity or equality.

Q6. Should epigenetic changes (like methylation in NR3C1, BDNF) influence mental health support?

R1: Epigenetic changes such as methylation in NR3C1 and BDNF play a crucial role in regulating stress response and emotional resilience. Recognizing these biomarkers can help mental health professionals design more targeted interventions that combine biological and psychological care.

R2: If such changes are reversible, both the state and employers share responsibility. The state should provide accessible healthcare frameworks, while employers must ensure workplace conditions that reduce chronic stress and support preventive wellness programs.

R3: We must be careful not to pathologize normal stress, as some stress is adaptive and essential for motivation. The focus should remain on identifying maladaptive, prolonged stress responses that impair functioning rather than labeling ordinary workplace pressure as pathological.

R4: Epigenetic findings should complement—not replace—psychological counseling. Integrating biological data with therapy allows clinicians to address both the neural and emotional dimensions of stress recovery, promoting a holistic model of mental health care.

R5: These discoveries highlight that stress-induced gene expression can change with lifestyle and therapy. Encouraging employees to engage in mindfulness, exercise, and social support can help reverse harmful methylation, reinforcing resilience through natural and behavioral means.

R6: In workplaces, HR and healthcare teams should collaborate to ensure ethical integration of epigenetic insights, focusing on well-being rather than performance monitoring or productivity enhancement.

These builds trust and prioritize employee mental health.

R7: From a policy standpoint, governments should invest in national stress-epigenetic research programs to understand how social and occupational stressors affect gene regulation, especially among women and high-risk professions.

R8: Employers should be educated on the difference between intervention and surveillance. Providing optional wellness support rooted in science is ethical; mandatory genetic or epigenetic screening, however, violates privacy and autonomy.

R9: The danger lies in overinterpreting data. Epigenetic modifications are dynamic and context-dependent, meaning they change over time. Mental health professionals must interpret results cautiously and avoid deterministic conclusions that could stigmatize individuals.

R10: Ultimately, the goal is to align epigenetic science with compassionate mental health care. By merging biological understanding with counseling, society can move toward prevention, empowerment, and healing rather than punishment or labeling.

Ethical & Legal Dimensions

Q7. Do we need a GINA-style law in India?

R1: Yes, India urgently needs a GINA-style law to protect citizens from genetic discrimination in employment, insurance, and education. Without such legislation, individuals remain vulnerable to misuse of their genetic or neuro-genetic data.

R2: A GINA-style framework would ensure equal opportunity for all individuals, preventing employers and insurers from making decisions based on someone's genetic predisposition to disease, stress, or mental health conditions.

R3: The growing use of genetic testing in healthcare and corporate wellness programs in India makes such a law essential to safeguard privacy, consent, and fair use of personal biological data.

R4: A robust genetic nondiscrimination act could also strengthen trust in biomedical research, encouraging more people to participate in genetic and epigenetic studies without fear of social or professional repercussions.

R5: The law should explicitly prohibit the collection or sharing of genetic information by employers, insurers, or recruiters unless medically necessary and approved under ethical and regulatory oversight.

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R6: Implementation will require not only legislation but also strong judicial and administrative enforcement, ensuring violations are met with clear penalties and accessible complaint mechanisms for affected individuals.

R7: GINA-like protections could help India establish ethical benchmarks for future developments in neuro-genomics, preventing the emergence of a two-tier system where only privileged groups benefit from genetic technologies.

R8: A specific Neuro-Genetic Privacy Bill could extend these protections to mental health genetics, addressing unique risks associated with the use of brain and stress-related gene data in professional settings.

R9: a GINA-style law would reaffirm India's commitment to bioethics, equity, and human dignity, ensuring that advances in genetic science empower people rather than expose them to discrimination or exclusion.

R10: I feel India's move toward rapid genomic integration makes a GINA-style law both urgent and inevitable. Such legislation would not only secure citizens against genetic bias but also promote confidence in emerging neuro-genetic applications across healthcare, education, and employment. Without it, individuals risk exploitation, data breaches, and unethical profiling, which could severely undermine trust in India's biomedical innovation ecosystem. A well-drafted genetic nondiscrimination act would therefore uphold personal dignity while ensuring that scientific progress aligns with justice and equality.

Q8. What safeguards are urgent against genetic discrimination?

R1: Genetic discrimination poses serious ethical and social risks, especially as genome testing becomes more accessible. Urgent safeguards are needed to ensure that genetic data is used solely for medical and research purposes, not employment or insurance decisions.

R2: Yes, employers should be strictly banned from requesting or accessing any form of genome data. Such information is deeply personal, and its misuse could lead to exclusion, bias, or stigmatization in professional environments.

R3: Beyond legislation, establishing an independent genetic ethics board would provide continuous oversight, addressing new ethical dilemmas as technology evolves and ensuring accountability beyond legal compliance.

R4: Corporate wellness genomics must operate under transparent consent frameworks where employees choose participation voluntarily, and anonymized data is handled only by certified health professionals, not HR departments or management.

R5: Strict data protection protocols should be enforced, including encryption, anonymization, and penalties for breaches. India's digital health infrastructure must align with international privacy standards like GDPR to ensure public trust.

R6: Education plays a key role. Employers, policymakers, and healthcare providers must undergo bioethics training to understand what constitutes genetic discrimination and the moral implications of misuse.

R7: Employees must be granted legal ownership of their genetic information, meaning they control who can access, store, or share their data, ensuring true autonomy and informed consent.

R8: The government should establish a National Genetic Data Registry monitored by ethical and legal experts to track usage, prevent cross-sector exploitation, and uphold transparency in genetic research and workplace applications.

R9: In balancing wellness genomics and ethics, the focus should be on empowerment, not surveillance. Genetic insights must help individuals enhance health not become tools for corporate evaluation or profiling.

R10: the combination of legislation, ethical oversight, and public awareness will offer the strongest protection. Preventing discrimination requires a culture of respect for biological individuality, where genetics inform care, not control.

Q9. Should corporations adopt mandatory neuro-genetic profiling?

R1: Mandatory neuro-genetic profiling by corporations would raise profound ethical, legal, and human rights concerns. While its intent may be to improve mental health and reduce workplace suicides, compulsion undermines personal autonomy and privacy. Genetic and neurobiological data should never become a condition of employment.

R2: Although early detection of mental health risks could theoretically reduce workplace suicides, the solution lies more in organizational reform and mental health support systems, not genetic surveillance. Stress prevention through humane management is more ethical and effective than compulsory profiling.

R3: Yes, such practices border dangerously on biological surveillance, blurring the line between care

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and control. Neuro-genetic information is intimate and could easily be misused to categorize employees or influence hiring and promotion decisions.

R4: Employee unions and representative groups should absolutely hold veto power over any policy involving genetic testing. Decisions about participation must remain voluntary, confidential, and supported by informed consent and counseling services.

R5: Corporations must focus instead on creating supportive environments, mental health literacy, and counseling access rather than seeking to predict vulnerability through genetic means. True prevention is cultural, not genetic.

R6: Introducing mandatory profiling would risk stigmatizing employees who test “high-risk” and may even discourage openness about mental health struggles. Such labeling contradicts the principles of dignity and equality in the workplace.

R7: Neuro-genetic data should only be used under medical supervision for individual well-being, never for organizational metrics. Corporate use of such sensitive information without consent would constitute a breach of medical ethics.

R8: Instead of enforcing genetic profiling, companies can collaborate with occupational health experts to design voluntary wellness programs integrating neuroscience insights with mindfulness and behavioral therapy.

R9: From a legal standpoint, mandatory neuro-genetic testing could violate privacy and labor rights protected under constitutional and international human rights frameworks. Regulatory authorities must explicitly prohibit it.

R10: neuro-genetic science holds promise for understanding stress and mental health, its application must remain voluntary, confidential, and guided by ethics boards, ensuring technology serves people not the other way around.

Jurisprudential & Policy Context

Q10. How might the Seethea framework (safety, equity, ethics, humanity, awareness, tranquility) guide practical decisions?

R1: The Seethea framework provides a balanced foundation for aligning science, law, and human welfare. It ensures that decisions around neuro-genetics prioritize moral accountability and social

responsibility while promoting mental health protection and fairness in employment practices.

R2: In practical terms, safety ensures that workplace neuro-genetic programs do not expose employees to harm physically, mentally, or socially while maintaining strict confidentiality of biological data.

R3: Equity emphasizes that all employees, regardless of social status or job level, must have equal access to wellness programs, counseling, and protection from discrimination based on genetic predisposition.

R4: Ethics demands that consent, transparency, and fairness remain central to all neuro-genetic applications. No corporate goal should override human dignity or informed choice.

R5: Humanity calls for empathy-driven HR policies that value people beyond productivity. It reminds policymakers that neuro-genetic insights should be used to heal, not to control or classify workers.

R6: Awareness highlights the importance of training HR managers, policymakers, and healthcare providers on the implications of genetic data. Awareness helps bridge the gap between science and ethical implementation.

R7: Tranquility focuses on cultivating psychologically safe workplaces where employees feel secure discussing stress or genetic concerns without fear of stigma or retaliation.

R8: Among these principles, ethics and equity are the most neglected in Indian HR law. While safety and welfare are partially addressed, laws rarely protect workers from discrimination based on biological or psychological traits.

R9: Yes, it could easily be codified into a compliance checklist, guiding organizations on how to ethically integrate neuroscience and genetics into workplace wellness and legal standards.

R10: Judges should absolutely receive training in Seethea before admitting neuro-genetic evidence. Such education would help them interpret scientific data responsibly, ensuring that verdicts reflect both legal rigor and human compassion.

Q11. Could Indian courts admit neuro-genetic evidence like MAOA-L in aggression cases?

R1: Indian courts could consider admitting neuro-genetic evidence like MAOA-L in aggression cases, but only under strict scientific and ethical scrutiny. The goal should be to understand behavioral predispositions, not to excuse unlawful conduct. Such

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evidence can add biological context but must never override accountability.

R2: Yes, there's a real risk of defendants using genetic explanations to justify criminal acts, which could weaken personal responsibility. Therefore, the courts must treat these findings as mitigating not exculpatory factors, balancing compassion with justice.

R3: The best approach is to recognize genetic predisposition as one influence among many, alongside environment, upbringing, and free will. Law should uphold responsibility while acknowledging that biology may shape but not dictate behavior.

R4: Incorporating neuro-genetic findings demands judicial literacy in behavioral genetics. Judges should understand the probabilistic nature of genetic data to avoid misinterpretation that could lead to unfair verdicts or bias.

R5: Such evidence could also have a place in civil cases, like workplace harassment or emotional distress claims, if it helps explain stress reactivity or trauma susceptibility, provided privacy and consent standards are respected.

R6: courts must adopt clear admissibility standards, ensuring evidence comes from peer-reviewed, reproducible science with expert testimony capable of contextualizing its limits.

R7: Neuro-genetic evidence should serve as a supportive diagnostic tool, not a determinant of guilt or innocence. Legal interpretation must weigh moral agency and societal safety above genetic predisposition.

R8: The judiciary must guard against genetic determinism, ensuring individuals are seen as capable of choice. Science can inform sentencing or rehabilitation but not erase moral boundaries.

R9: Expert panels comprising geneticists, psychologists, and ethicists should guide how courts handle such complex data, establishing a transparent framework for its proper use.

R10: neuro-genetic evidence should aim to enhance rehabilitative justice helping courts design better correctional or therapeutic programs while preserving equality before the law and the principle of human accountability.

Q12. Should India create a National Neuro-Genetic Regulatory Authority?

R1: Yes, I strongly believe India should establish a National Neuro-Genetic Regulatory Authority. With

the growing use of genetic and neurobiological data in medicine, education, and the workplace, a dedicated body is essential to ensure ethical oversight and protect individual rights.

R2: In my opinion, this authority should be independent like SEBI, not housed under the Health Ministry. Independence would allow it to function without political or industrial influence and make decisions purely based on scientific and ethical considerations.

R3: Its scope must go beyond research regulation. The authority should also monitor corporate HR practices, particularly those involving neuro-genetic profiling, employee wellness genomics, or stress-resilience programs to ensure that no employee is discriminated against based on biological data.

R4: To prevent regulatory capture, the authority's leadership must include experts from diverse fields genetics, law, psychology, bioethics, and human rights with transparent appointment processes and term limits to avoid monopolization by powerful groups.

R5: I would also recommend creating a citizen ethics advisory board under this authority to provide independent reviews of corporate and research proposals involving neuro-genetic data. Public accountability will strengthen its legitimacy.

R6: Another key function should be to develop standard operating procedures for consent, data storage, and access rights, ensuring all genetic information remains confidential and under individual ownership.

R7: The authority should also introduce certification and licensing for laboratories conducting neuro-genetic testing to maintain uniform quality, accuracy, and ethical compliance across India.

R8: Education and capacity-building should be a priority. Judges, healthcare providers, and HR professionals need specialized training on neuro-genetic ethics, so the legal and corporate systems can handle such sensitive information responsibly.

R9: NNGRA must collaborate with international regulatory bodies like UNESCO and WHO to align India's policies with global standards while adapting them to local legal and cultural realities.

R10: the goal of such an authority should not be control but protection and balance ensuring that neuro-genetic innovation benefits humanity without compromising privacy, dignity, or equality in any professional or personal context.

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Questionnaire: Neurogenetic Profiling of Stress Genes in the Indian Context

Section 1: Clinical and diagnostic application of stress genes

1) Diagnostic utility for stress-related neurogenes in chronic stress, depression, anxiety

#	Interviewee response
1	Testing has adjunct value. Variants in NR3C1, FKBP5, SLC6A4, and BDNF can flag altered HPA regulation or synaptic plasticity, but findings are probabilistic and must be integrated with clinical history, symptom scales, and biomarkers like morning cortisol.
2	Utility is greatest for risk stratification and tailoring follow up. Results guide intensity of psychotherapy and lifestyle programs rather than serving as stand-alone diagnostics for depression or anxiety.
3	Panels help identify subgroups with stress reactivity, informing earlier interventions. I use them to prioritize sleep, trauma-focused therapy, and relapse prevention planning.
4	Genetic results refine differential diagnosis when symptoms are ambiguous. For example, FKBP5 risk plus trauma history supports a PTSD-focused pathway rather than generic anxiety management.
5	Epigenetic readouts, such as NR3C1 methylation, add state sensitivity. They can reflect current stress load and recovery, aiding monitoring over time.
6	Diagnostic yield rises when combined with endocrine testing, HRV, and inflammatory markers. A multimodal profile is more actionable than genotype alone.
7	Clinical use is strongest for prevention and personalization. It supports choosing therapies with better adherence prospects for the patient's biology and preferences.
8	Testing can reduce trial-and-error by identifying patients who may respond poorly to certain agents or who need slower titration due to stress sensitivity.
9	Results help set expectations. I counsel that genes indicate tendencies, not destiny,

	which reduces shame and supports engagement in therapy.
10	I avoid overinterpretation. Psychological context, social determinants, and workload patterns explain more variance than genes alone, so genetics complements a thorough psychosocial assessment.

2) Recommended testing modalities for NR3C1, BDNF, SLC6A4

#	Interviewee response
1	Targeted qPCR or ddPCR for common variants in SLC6A4 and BDNF is practical and affordable in clinic.
2	Bisulfite-qPCR or pyrosequencing for NR3C1 and BDNF promoter methylation provides epigenetic state information linked to HPA feedback and neuroplasticity.
3	A small targeted NGS panel improves coverage and future proofs the test while keeping interpretation manageable.
4	Microarrays are more research oriented. I reserve them for cohort studies rather than individual care.
5	RNA expression profiling can be informative in research, but peripheral blood transcriptomics is variable for individual decisions.
6	ddPCR is my choice when low-frequency variants or subtle copy changes are suspected due to its precision.
7	Use saliva or whole blood for convenience, but standardize collection time to control for diurnal cortisol effects on epigenetic assays.
8	Confirm key findings with a second method when results will alter management. Orthogonal validation improves confidence.
9	Include rigorous QC, ancestry markers, and lab accreditation to reduce batch effects and miscalls.
10	Re-test epigenetic markers after intervention at consistent intervals to track change rather than relying on a single snapshot.

3) Consensus on using a non-stress genome model as a comparative baseline

#	Interviewee response
1	The field favors ancestry-matched population baselines rather than a single non-stress genome. Context matters.

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2	Polygenic and epigenetic risk must be interpreted against large reference cohorts with similar age, sex, and ethnicity.
3	Environmental exposure history is essential. Baselines that ignore trauma or socioeconomic factors can mislead.
4	There is agreement that single gene effects are small. Multilocus models outperform one-off comparisons.
5	Longitudinal baselines are better than cross-sectional snapshots for stress-related traits.
6	Consensus supports using standardized effect sizes and confidence intervals rather than binary normal vs abnormal labels.
7	Functional readouts, such as cortisol awakening response, complement genomic baselines and improve interpretability.
8	Studies caution against exporting baselines across populations due to allele frequency and LD differences.
9	Reference datasets should be transparent about recruitment, stress exposure, and medication use.
10	In practice, I blend cohort baselines with the patient's own prior epigenetic measures to see direction of change.

4) How CRH or FKBP5 risk variants alter clinical management

#	Interviewee response
1	I intensify early trauma-focused psychotherapy and stress hygiene, anticipating higher HPA reactivity.
2	Closer monitoring of sleep, nightmares, and cortisol-linked symptoms guides quicker adjustments to care.
3	I emphasize gradual exposure-based therapies and mindfulness with longer stabilization phases.
4	Pharmacotherapy plans consider slower titration and careful review of agents that can affect HPA axis dynamics.
5	I add relapse prevention check-ins, especially around predictable stress periods at work or home.
6	Collaboration with occupational health to modify workload and breaks becomes a priority.
7	I may use prazosin for trauma-related nightmares where indicated, with careful follow up.

8	Education on stress physiology reduces fear and improves adherence to behavioral prescriptions.
9	I consider comorbidity screens for substance use, given higher self-medication risk under chronic stress.
10	Repeat epigenetic assessments can document recovery, which is motivating and helps fine tune therapy.

5) Pharmacological implications for hormone regulation and emotional stability

#	Interviewee response
1	SLC6A4 variation may influence SSRI response. I set expectations about dose and time to benefit and pair meds with therapy.
2	NR3C1 sensitivity can shape cortisol feedback. I avoid agents that worsen insomnia or activation in high HPA responders.
3	FKBP5-linked dysregulation suggests careful stressor reduction alongside meds to prevent flare ups.
4	Sleep stabilizers and circadian hygiene improve outcomes across genotypes and are low risk first moves.
5	For PTSD features, prazosin may aid nightmares. I monitor blood pressure and daytime fatigue.
6	Anxiolytics are used sparingly and short term to avoid dependence, focusing on CBT for durable change.
7	Anti-inflammatory strategies, diet quality, and exercise support mood through neuroimmune pathways, independent of genotype.
8	I consider drug interactions with contraceptives or hormone therapy in women, given effects on stress circuits.
9	If prior SSRI trials failed, I might try SNRI or psychotherapy-first sequences while managing expectations.
10	I document shared decision making so pharmacologic choices reflect patient values as well as biology.

6) Role of genetic counseling on methylation of NR3C1, BDNF and future risks

#	Interviewee response
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1	Counseling explains that methylation is dynamic and can improve with therapy, sleep, exercise, and trauma recovery.
2	I stress non-determinism. Results indicate sensitivity, not a fixed fate, which counters fear and stigma.
3	We review privacy, data storage, and who can access results to protect autonomy.
4	I provide clear action plans linking results to concrete steps the patient can take this month.
5	Family history and life events are integrated so findings make sense in the patient's story.
6	We set realistic timelines for retesting to measure change without overtesting.
7	I screen for workplace factors that perpetuate methylation patterns and recommend feasible adjustments.
8	Counseling includes medication education, especially around activation, sleep, and stress-hormone effects.
9	We discuss insurance and disclosure choices, avoiding unnecessary sharing of genetic details.
10	I coordinate with therapists so biological insights align with CBT, EMDR, or mindfulness goals.

7	Absence of specialized genetic ethics committees increases risk of misuse.
8	The lack of independent data protection regulators complicates accountability.
9	Employees may face stigmatization or emotional distress due to test outcomes.
10	Transparency and oversight are limited, allowing unchecked corporate influence in data handling.

Section 2: Neuro-legal and ethical concerns in the workplace

1. Three greatest ethical or legal hurdles

#	Interviewee Response
1	The first hurdle is genuine informed consent—employees must never feel coerced to undergo genetic testing tied to employment.
2	Second, India lacks a clear legal structure to define permissible use and ownership of neuro-genetic data.
3	The third is enforcement. Even if laws exist, ensuring compliance across private corporations remains difficult.
4	Public awareness is low; most employees do not understand the implications of sharing genetic data.
5	Employers could misuse results for role assignment or termination decisions.
6	The ethical challenge lies in balancing workplace safety with personal privacy.

2. Lack of ethical and legal guidelines

#	Interviewee Response
1	Currently, there is no law specifically addressing neurogenetic testing in India.
2	Medical Council guidelines mention genetics but not workplace profiling.
3	Bioethical review boards lack jurisdiction over corporate testing.
4	India's data privacy bill remains under development, delaying protection.
5	No framework exists for consent storage or revocation.
6	Ethical norms vary across sectors, creating inconsistent practices.
7	Genetic data often falls outside routine labor regulations.
8	There is no grievance redressal mechanism for employees facing genetic discrimination.
9	Inter-ministerial coordination between Health, Labor, and IT ministries is absent.
10	Lack of trained ethics professionals to guide neuro-genetic policy-making.

3. Difficulty in obtaining informed consent

#	Interviewee Response
1	True consent is nearly impossible when employment depends on it.
2	Many employees may sign forms without understanding the consequences.
3	HR departments are ill-equipped to explain genetic risks accurately.
4	Power imbalance between employer and employee nullifies voluntariness.
5	Language barriers further complicate comprehension of consent documents.
6	There's no standardized consent form for neuro-genetic data use.

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7	Consent once given is rarely revocable under current Indian practice.
8	Lack of independent witnesses in consent collection compromises fairness.
9	Employees fear retaliation if they refuse participation.
10	Ethical review boards are seldom consulted in private sector testing.

4. Genetic discrimination and privacy risks

#	Interviewee Response
1	Genetic results can be used to deny promotions or benefits.
2	Data leaks could expose mental health vulnerabilities.
3	“Brain data theft” could enable manipulation in recruitment.
4	Corporate misuse may go undetected without transparency audits.
5	Re-identification of anonymized data remains a threat.
6	Insurers could use results to deny claims.
7	Lack of cybersecurity standards for genomic databases.
8	Absence of whistleblower protections deters reporting misuse.
9	Cross-border data transfers increase risk of unauthorized sale.
10	Employers may indirectly pressure staff into sharing genetic results.

5. Consequences of no neuro-genetic law

#	Interviewee Response
1	Employees face late diagnosis of stress-related neural disorders.
2	Increased absenteeism and mental health crises in high-stress sectors.
3	Higher economic loss due to reduced productivity and early retirement.
4	Out-of-pocket treatment costs increase due to lack of insurance coverage.
5	Lack of legal accountability for workplace-induced disorders.
6	Limited access to preventive healthcare programs.
7	Rise in workplace suicides and burnout cases.

8	Employees experience prolonged suffering without early screening.
9	Employers lose skilled workers due to unmanaged chronic stress.
10	Public healthcare bears indirect costs of preventable neural disorders.

6. Inability to address mental instability or financial support gaps

#	Interviewee Response
1	Insurance policies exclude neuro-psychiatric disorders from coverage.
2	Mental health parity is poorly enforced in India.
3	Employers rarely fund counseling or therapy programs.
4	Workers face long wait times for psychiatric care in public hospitals.
5	Absence of neuro-health leave policies worsens outcomes.
6	Stigma prevents employees from claiming mental health benefits.
7	Financial loss from untreated conditions can exceed monthly income.
8	No legal mechanism compels employers to cover mental health treatment.
9	Early intervention programs are nearly nonexistent.
10	Psychological crises lead to career instability and family distress.

7. Rise in stress-related deaths and conflicts

#	Interviewee Response
1	High-pressure jobs cause chronic cortisol elevation and burnout.
2	Work-related anxiety disorders are increasingly reported.
3	Suicide rates are climbing in finance and IT sectors.
4	Unaddressed stress fuels workplace aggression.
5	Poor HR awareness worsens conflict resolution.
6	Lack of counseling support in corporate policy.
7	Employers focus on output, ignoring emotional fatigue.
8	Long working hours reduce family and social stability.
9	Genetic predisposition magnifies unmitigated stress.

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10	Early detection through neuro-genetic insight could prevent many deaths.
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8. Feasibility of mandatory psycho-genome screening

#	Interviewee Response
1	Technically feasible, but ethically problematic if made mandatory.
2	Screening must remain voluntary and consent-based.
3	Feasibility depends on affordability and data security.
4	Corporate infrastructure for safe testing is lacking.
5	Implementation must align with international ethics norms.
6	Compulsory testing violates autonomy and privacy.
7	Awareness programs are a better first step.
8	Mental health support should precede genetic screening.
9	Feasibility improves if regulated under national neuro-genetic authority.
10	Testing should aim for prevention, not classification.

9. Need for expert collaboration

#	Interviewee Response
1	Geneticists alone cannot design fair policies.
2	Lawyers ensure compliance with data and labor laws.
3	Psychologists interpret behavioral outcomes ethically.
4	Collaboration bridges scientific and legal gaps.
5	Joint committees can draft national neuro-genetic guidelines.
6	Cross-disciplinary boards prevent bias in interpretation.
7	Training programs for HR should be co-developed.
8	Legal experts ensure employee protections in consent forms.
9	Psychologists translate neuro-data into supportive care.
10	Unified frameworks ensure both innovation and human rights.

10. Aligning schemes with biomedical and data privacy laws

#	Interviewee Response
1	Align testing with India's Personal Data Protection Bill.
2	Approval from ethics committees must be mandatory.
3	Use anonymized datasets for corporate analytics.
4	All labs must be ICMR or NABL accredited.
5	Develop national SOPs for data storage and consent.
6	Align with WHO and UNESCO bioethics charters.
7	Introduce legal penalties for misuse of neuro-genetic data.
8	Enforce transparency in reporting corporate wellness outcomes.
9	Incorporate regular audits and employee feedback systems.
10	Create a national neuro-genetic registry under Health Ministry supervision.

****Section C: Neurocognitive Rights and Emerging Legal Concepts****

Familiarity with Neurorights and Understanding	Should India Adopt Separate Neurocognitive Rights Law	Constitutional Provisions that Could Support the Right	Should Counseling Access be a Fundamental Right under Article 21	Role of Psychologists in Preventive Interventions
Very familiar. Neurorights protect mental privacy, cognitive liberty, and psychological integrity; they	Yes, separate legislation is needed	Articles 14, 15, 19, 21	Yes	Lead early screening, brief therapy, and resilience training; coordinate with psychiatrists for escalation.

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limit intrusive tech and protect consent for brain data.					Underst and as rights to mental privacy and freedom from invasive monitoring.				and psychoeducation; refer complex cases timely.
Somewhat familiar. Neuro rights guard against non-consensual brain data capture and manipulation, preserving autonomy and dignity.	Yes, separate legislation is needed	Articles 14, 21	Yes	Deliver counseling, stress education, and triage; build workplace programs with clear referral pathways.	Very familiar. Neuro rights create ethical guardrails for AI, wearables, and brain data in clinics and workplaces.	Yes, separate legislation is needed	Articles 14, 19, 21, 23	Yes	Design preventive protocols, supervise counselors, and ensure ethical use of digital tools.
Very familiar. They ensure mental privacy, freedom to think, and protection from coercive neurotech in work and education.	Yes, separate legislation is needed	Articles 14, 19, 21	Yes	Provide CBT, mindfulness-based skills, and crisis prevention; collect outcomes for policy feedback.	Somewhat familiar. Focus on consent, minimal collection, and safe storage of brain related data.	Amend existing Acts could suffice	Articles 14, 21	Yes	Primary contact for subclinical distress; run group programs and monitor risk factors.
Have heard of it.	Uncertain	Article 21	Uncertain	Community outreach	Very familiar. They protect thoughts, emotion	Yes, separate legislation is needed	Articles 14, 15, 21	Yes	Integrate counseling into occupational health; protect

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s, and identity from profiling and commercial exploitation.				confidentiality and consent.
Somewhat familiar. Neurorights aim to stop surveillance of cognitive states and maintain agency.	Yes, separate legislation is needed	Articles 19, 21	Yes	Develop culturally sensitive interventions and family engagement models.
Very familiar. Core ideas are privacy of thought, informed consent, and fair access to mental health care.	Amend existing Acts could suffice	Articles 14, 21	Yes	Create standardized toolkits for HR teams and train first responders.
Have heard of it. Basic view is dignity and privacy for the mind in	Yes, separate legislation is needed	Articles 14, 19, 21	Yes	Lead school and workplace wellness modules; maintain data privacy

digital settings.				during screenings.
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Section D: Implementation and Enforcement Challenges

Practical Challenges in Implementing Mandatory Psychological Support	Government Funding & Regulation of Wellness Programs	Confidentiality & Data Privacy Mechanisms	Need for Legal Definition of Psychological Imbalance	Role of State and Central Mental Health Authorities
Lack of trained counselors and stigma among employees.	Mixed funding model — employer plus government subsidy.	Amend IT Act to cover counseling confidentiality.	Yes, clear definition helps separate minor distress from clinical illness.	Full regulatory oversight with regular compliance audits.
Low awareness and cost barriers in small companies.	Employer contribution with government tax incentives.	New data protection law specifically for mental health records.	Yes, with flexible interpretation under labor law.	Advisory and accreditation roles for quality assurance.
Shortage of mental health professionals across India.	Government grants for public-private partnerships.	Confidentiality clauses under revised Mental Healthcare Act.	Yes, should protect subclinical cases legally.	State authorities should oversee implementation and

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				reporting.
Cultural stigma and confidentiality fears among workers.	Insurance-based model integrated into employee benefits.	Strict professional codes and encryption-based storage.	Yes, must prevent misuse of psychiatric labels.	Central authority should set policy; state enforces regionally.
Lack of standardized screening protocols.	Central funding for national mental health initiatives.	Data anonymization and limited access to HR departments.	Yes, with ethical oversight by psychologists.	Shared role: central policy, state-level monitoring.
Corporate reluctance due to perceived non-productivity.	Employer-funded with corporate social responsibility tax relief.	IT Act amendments to define mental data protection norms.	Yes, provide clarity for insurance and liability.	Accreditation and certification authority for programs.
Absence of legal compulsion for private firms.	Mixed funding—state grants plus private participation.	Independent oversight board for mental data protection.	Yes, essential for preventive health policy.	Advisory body issuing best-practice standards.
Difficulty in measuring program outcomes.	Employer-driven schemes regulated under	Encrypted record-keeping and client consent logs.	Uncertain, but partial legal recognition may help.	Joint taskforce for research, policy, and monitoring.

	OSH Code.			
Urban-rural disparity in service availability.	Government subsidy for startups offering mental health tech.	Clearer HIPAA-style national law for psychological data.	Yes, but interpretation should remain flexible.	State-level implementation guided by central norms.
Poor coordination between HR and health departments.	Employers fund; government provides technical support.	New National Mental Health Data Protection Framework.	Yes, to ensure preventive interventions receive equal recognition.	Central body to license programs and conduct audits.

Section E: Future Legal Reforms and Recommendations

Amendments Proposed to Mental Healthcare Act, 2017	Separate Act or Integration Approach	International Frameworks to Adopt	Balancing Employer Interests & Employee Rights	Three Critical Legal Reforms Needed
Introduce preventive counseling mandates and	Support separate <i>Neurocognitive and Psych</i>	WHO Mental Health Action Plan, UNESCO's	Encourage incentives for compliance rather than	1. Define "psychological imbalance." 2. Mandate workplace counseling. 3. Strengthen privacy law for mental data.

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					ve oversi ght body.
	Add clause for manda tory emplo yee mental health leave policy.	Separ ate Act focusi ng on workp lace wellne ss.	Europ ean Union Charte r on Menta l Health .	Encou rage public - privat e partne rships in wellne ss infrast ructur e.	1. Workp lace wellne ss fund. 2. Digital counse ling regulat ion. 3. Preven tive health in labor codes.
	Create frame work for early detecti on and interv ention progra ms.	Integr ate provis ions into curren t legisla tion.	CRPD Article 25 (Healt h Rights).	Mand ate reporti ng transp arency but limit data collect ion.	1. Annua l wellne ss audits. 2. Licens ing of counse lors. 3. Whistl eblow er protect ion.
	Includ e epigen etic and geneti c stress indicat ors in	Suppo rt new dedica ted act for neuro cognit ive protec tion.	UNES CO Univer sal Declar ation on Bioeth ics and Huma	Simpli fy compl iance reporti ng via central ized portal.	1. Nation al Neuro geneti c Autho rity. 2. Anti-discri

	public health monit oring.		n Rights .		minati on in hiring. 3. AI ethics in mental health.
	Mand ate integr ation of couns eling within emplo yee welfar e schem es.	Separ ate Act ensure s better policy visibil ity.	WHO and ILO joint guideli nes on worke r well- being.	Use incenti ves, not puniti ve measu res, to motiv ate compl iance.	1. Legal definit ion of psych ologic al harm. 2. Manda tory counse ling servic es. 3. Regul ar policy evalua tion.

Conclusion

This report has provided a comprehensive exploration of cognitive psychology, from its historical and philosophical roots to its modern status influenced by neuroscience and artificial intelligence. The field's interdisciplinary nature is evident in its continuous integration of insights from diverse domains, highlighting that understanding the human mind requires a holistic perspective that bridges biological, computational, and social aspects. The historical evolution of cognitive psychology, marked by shifts in prevailing metaphors and methodologies, underscores that scientific understanding is dynamic and constantly refined by new evidence and conceptual tools. such as neuro genetic testing and the adopt action process in neuro genetic testing . Key cognitive processes such as sensation, attention, perception, learning, memory, language, thinking, problem-solving, intelligence, reasoning, and decision-

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making have been detailed. Sensation, the initial gathering of raw sensory data, is transformed into meaningful experience through perception, a process of active construction by the brain rather than passive reception. Attention acts as a limited, dynamic resource, selectively filtering and prioritizing information based on a complex interplay of external stimuli and internal states, with various theories attempting to explain its mechanisms, from early filters to biased competition models.

Learning, a relatively permanent change in behavior due to experience, encompasses diverse forms from classical and operant conditioning to social, verbal, concept, and skill learning. Memory, the ability to encode, store, and retrieve information, operates through multiple systems (sensory, short-term, long-term) and models (multi-store, levels-of-processing, working memory, connectionist), with forgetting understood as a complex process influenced by interference, decay, displacement, motivated factors, and cue dependency. Language, a structured and dynamic system, enables communication and shapes thought, with its acquisition progressing through predictable stages and influenced by both innate capacities and environmental factors. Thinking, encompassing convergent and divergent styles, along with creative and critical approaches, is essential for problem-solving, which involves a cyclical process of identification, strategy formulation, and evaluation, often hindered by perceptual, emotional, intellectual, expressive, environmental, and cultural blocks. Finally, intelligence, reasoning, and decision-making represent higher-order cognitive functions, with various theories attempting to define and measure intelligence, and reasoning and decision-making processes employing both systematic algorithms and adaptive heuristics.

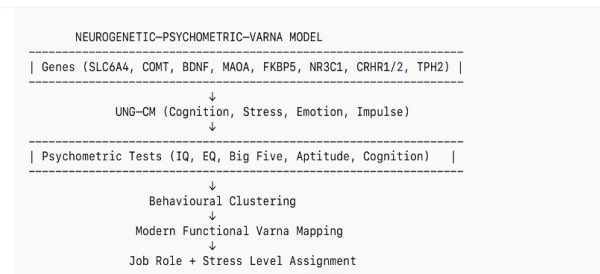
The detailed analysis of these cognitive functions reveals that the brain is an active interpreter, constantly constructing subjective reality from sensory input, and that cognitive processes are not isolated but highly interconnected and interactive. Disruptions in these processes, such as illusions, delusions, and hallucinations, offer valuable insights into the normal workings of the mind, demonstrating how even "failures" can illuminate fundamental mechanisms. The ongoing convergence of biological and computational perspectives promises a more unified and comprehensive understanding of the mind-brain connection, emphasizing that human cognition is a complex interplay of inherent

structures, learned experiences, and dynamic neural activity. This comprehensive understanding is vital for students preparing for examinations, as it provides a robust framework for comprehending the intricacies of the human mind and its profound influence on behavior and experience.

Research methodology :2

1)Conceptual theory analysis and neuro genetic varna personality traits model

RESEARCH METHODOLOGY AND FRAMEWORK NEUROGENETIC–PSYCHOMETRIC– VARNA MODEL



The below flow chart provides the basic sketch model for the process to evaluate stress genes in order to analyse the tailoring job specifications for employees masked on their Neurogenetic varna personality traits model in corporate seatings

Neurogenetic intelligence framework With SEETHA FRAMEWORK

1. Stress Genes = ENTIRE GENOME SEQUENCING
SLC6A4,COMT,MAOA,BDNF,TPH2,FKBP5 ,NR3C1,SLC6A4,HTTLPR INFLUENCE ON BRAIN ADAPTABILITY AND TOLERANCE TOWARDS ENVIRONMENT
2. THE INTELLIGENCE SCALE MEASURABILITY USING WAIS, WISC SCALE
3. THE INGCPT=NEUROGENETIC PROFILING MATRIX +INTELLIGENCE SCALE

SEETHA-Safety through legal regulations to ascertain the privacy of data and ethically transforming the framework to be utilised by the management for employees health and personality well being and equity accessible of this framework to employees self assessment with tranquility in data that are managed to tailor the job description and assigning the job based on

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cognitive status with making aware of benefits in utilising the INGCPT cognitive model.

The General Factor and Its Challengers: Spearman vs. Thurstone

The scientific study of intelligence began in earnest with a fundamental debate about its very structure. Is intelligence a single, unified ability that a person possesses to a greater or lesser degree? Or is it a collection of separate, independent talents? This question sparked one of the most important theoretical dialogues in the history of psychometrics, pitting the pioneering work of Charles Spearman against the multifactorial model of Louis L. Thurstone.

Spearman's Two-Factor Theory

At the dawn of the 20th century, British psychologist Charles Spearman made a groundbreaking observation. Using the newly developed statistical technique of factor analysis, he analyzed the scores of schoolchildren on a variety of seemingly unrelated cognitive tests, such as distinguishing pitch, judging weights, and solving math problems. He discovered a striking pattern: the scores were all positively correlated. A child who performed well on one test tended to perform well on all the others. Spearman called this phenomenon the "positive manifold".

To explain this, Spearman proposed his Two-Factor Theory of Intelligence in 1904. He theorized that every intellectual activity is determined by two types of factors :

1. The g-factor (General Intelligence): A single, pervasive cognitive ability that influences performance on all mental tasks. Spearman metaphorically described g as a form of "mental energy" that individuals possess in varying amounts. He believed it was innate and the primary engine of intellectual achievement.
2. The s-factors (Specific Abilities): A multitude of specific abilities that are unique to a particular task. For example, performance on a math test would be influenced by g as well as a specific s-factor for mathematical reasoning.

An effective analogy for this theory is to consider an athlete's overall physical prowess. An athlete's general fitness—their strength, stamina, and coordination—can be seen as their g-factor. This general fitness will influence their performance across a wide range of sports. However, to excel at a specific sport like basketball, they also need highly developed s-factors,

such as shooting accuracy and dribbling skills. Similarly, a computer's central processing unit (CPU) can be likened to g—its raw processing power affects everything it does—while its specific software programs are like s-factors, designed for particular tasks.

Thurstone's Theory of Primary Mental Abilities

In the 1930s, American psychologist Louis L. Thurstone mounted a significant challenge to Spearman's concept of a dominant g-factor. Using a more advanced form of factor analysis on a large battery of 56 different tests, Thurstone argued that the positive correlations Spearman observed were not due to a single general intelligence. Instead, he proposed that intelligence is a composite of several distinct, independent abilities, which he termed Primary Mental Abilities (PMAs).

Thurstone initially identified seven PMAs, arguing that an individual's intellectual profile was better described by their unique combination of these abilities rather than a single IQ score :

1. Verbal Comprehension: The ability to understand and use language, concepts, and ideas. (e.g., understanding a complex text).
2. Word Fluency: The ability to generate words rapidly. (e.g., thinking of as many words as possible that start with the letter 'B').
3. Number Facility: The ability to perform mathematical operations quickly and accurately. (e.g., solving arithmetic problems mentally).
4. Spatial Visualization: The ability to visualize and manipulate objects in two or three dimensions. (e.g., imagining how a flat piece of paper would look when folded into a box).
5. Associative Memory: The ability to memorize and recall information. (e.g., remembering pairs of words).
6. Perceptual Speed: The ability to quickly perceive details and identify similarities and differences in visual stimuli. (e.g., finding the two identical pictures in a row of similar images).
7. Reasoning: The ability to find rules and draw logical conclusions from information. (e.g., solving a logic puzzle).

Thurstone's model celebrated the diversity of human intellect, suggesting that a person could be gifted in some areas (like spatial visualization) while being average in others (like number facility).

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The Synthesis: Hierarchical Models

For a time, the theories of Spearman and Thurstone were seen as being in direct opposition. However, the debate was largely resolved by Thurstone himself and later psychometricians through the development of hierarchical models of intelligence. When Thurstone analyzed the scores on his own PMA tests, he found that the seven abilities, while distinct, were also positively correlated with each other. This suggested that there was, in fact, a higher-order factor influencing all of them—something very much like Spearman's *g*.

This led to the modern consensus view, best exemplified by the Cattell-Horn-Carroll (CHC) theory, which structures intelligence as a pyramid. At the apex is the *g*-factor, representing overall intelligence. Below it are several broad abilities (similar to Thurstone's PMAs), and at the base are many narrow, specific skills. This hierarchical model elegantly synthesizes the views of both Spearman and Thurstone, acknowledging both a general intellectual capacity and a profile of distinct cognitive strengths.

The Tension Between Predictive Power and Diagnostic Utility

The historical debate between Spearman and Thurstone illuminates a fundamental and ongoing tension within psychometrics: the trade-off between the efficiency of a single, powerful predictor and the richness of a multi-faceted diagnostic profile.

On one hand, Spearman's *g*-factor has proven to be one of the most robust predictors in all of psychology. A single *g* score, or a closely related Full-Scale IQ score, is strongly correlated with a vast array of important life outcomes, including academic success, job performance, income, and even physical health and longevity. From a purely predictive standpoint, *g* is remarkably efficient. It provides a powerful, if blunt, answer to the question, "How likely is this person to succeed in cognitively demanding environments?"

However, this predictive power comes at the cost of diagnostic utility. A single score offers little guidance for intervention or improvement. Telling a parent that their child has a low IQ score is disheartening and unhelpful; it identifies a problem without offering a solution.

This is where Thurstone's model of Primary Mental Abilities demonstrates its value. A profile of scores across different abilities has immense diagnostic and prescriptive power. It moves beyond the question of how smart a person is to how a person is smart. For a school psychologist, knowing that a student has high Verbal

Comprehension but struggles with Perceptual Speed provides a clear and actionable insight. It points directly to the need for specific interventions, such as providing extended time on tests or using assistive technology for written tasks. This detailed profile allows for targeted educational and therapeutic support tailored to the individual's unique cognitive landscape.

This very tension is re-enacted every time a modern intelligence test, like a Wechsler scale, is administered and interpreted. The Full-Scale IQ (FSIQ) serves as the best single predictor of general outcomes, functioning much like Spearman's *g*. Yet, clinicians and educators spend most of their time analyzing the index scores—Verbal Comprehension, Perceptual Reasoning, Working Memory, and Processing Speed—which function like Thurstone's PMAs. It is this pattern of strengths and weaknesses across the indices that allows them to diagnose learning disabilities, understand the cognitive effects of a brain injury, and design effective interventions. Thus, the century-old debate between a single general factor and multiple primary abilities is not just a historical footnote; it is a living dialogue that defines the practical application of intelligence testing today.

Broadening the Horizon - Modern Theories of Intelligence

While the hierarchical models provided a powerful synthesis of early psychometric research, some 20th-century theorists argued that even these expanded frameworks were too narrow. They contended that traditional intelligence tests, with their focus on academic and analytical skills, failed to capture the full spectrum of human intellect. This critique gave rise to modern theories that sought to broaden the definition of intelligence to include the diverse ways people solve problems, create, and navigate the complexities of the real world. Two of the most influential of these theories came from Howard Gardner and Robert Sternberg.

Gardner's Theory of Multiple Intelligences

In his seminal 1983 book, *Frames of Mind*, Harvard psychologist Howard Gardner proposed a radical reconceptualization of intelligence. He argued against the idea of a single, quantifiable intellect and instead posited that there are multiple, relatively independent "intelligences."

Gardner's definition of an intelligence is distinctively practical and culturally grounded: it is the "ability to solve problems or create products that are valued within one or more cultural settings".

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Based on a wide range of criteria, including evidence from brain damage studies, developmental psychology, and cross-cultural research, Gardner initially identified seven intelligences, later expanding the list to nine. His theory posits that every individual possesses a unique blend of these intelligences, with strengths in some areas and weaknesses in others.

The nine intelligences are:

1. Linguistic Intelligence ("Word Smart"): The capacity to use language effectively, both orally and in writing. This is the intelligence of poets, writers, orators, and lawyers. In the classroom, this can be nurtured through debates, creative writing, and storytelling.
2. Logical-Mathematical Intelligence ("Number/Reasoning Smart"): The ability to think logically, analyze problems, and carry out mathematical operations. This is the domain of scientists, mathematicians, and computer programmers. Classroom activities include logic puzzles, scientific experiments, and coding exercises.
3. Spatial Intelligence ("Picture Smart"): The ability to perceive the visual-spatial world accurately and to perform transformations on one's initial perceptions. Architects, artists, sailors, and surgeons rely heavily on this intelligence. It can be developed through drawing, mind-mapping, and working with 3D models.
4. Bodily-Kinesthetic Intelligence ("Body Smart"): The potential of using one's whole body or parts of the body to solve problems or create products. This is evident in dancers, athletes, actors, and craftspeople. Learning activities include role-playing, hands-on building, and physical movement.
5. Musical Intelligence ("Music Smart"): Skill in the performance, composition, and appreciation of musical patterns. This is the intelligence of composers, musicians, and conductors. It can be engaged by creating songs about academic content or using rhythm to memorize information.
6. Interpersonal Intelligence ("People Smart"): The capacity to understand the intentions, motivations, and desires of other people and, consequently, to work effectively with others. This is a key strength for teachers, therapists,

salespeople, and political leaders. Group projects, peer tutoring, and collaborative problem-solving nurture this intelligence.

7. Intrapersonal Intelligence ("Self Smart"): The capacity to understand oneself, to have an effective working model of oneself—including one's own desires, fears, and capacities—and to use such information effectively in regulating one's own life. Philosophers, psychologists, and spiritual leaders often exhibit high intrapersonal intelligence. Journaling, goal-setting, and mindfulness exercises are ways to cultivate it.
8. Naturalistic Intelligence ("Nature Smart"): Expertise in the recognition and classification of the numerous species—the flora and fauna—of one's environment. This was a later addition to the theory and is evident in biologists, conservationists, and farmers. It can be fostered through nature walks, caring for classroom plants or animals, and ecological projects.
9. Existential Intelligence ("Life Smart"): A sensitivity and capacity to tackle deep questions about human existence, such as the meaning of life, why we die, and how we got here. This intelligence is explored by philosophers and theologians.

Sternberg's Triarchic Theory of Intelligence

Another powerful modern framework is Robert Sternberg's Triarchic Theory of Intelligence. Sternberg was interested in what he called "successful intelligence," which he defined as the ability to achieve success in life according to one's personal standards, within one's sociocultural context. He argued that traditional IQ tests measure only a fraction of the abilities needed for real-world success. His theory proposes three distinct but interrelated types of intelligence that work together :

1. Analytical Intelligence ("Book Smarts"): This is the component most closely aligned with traditional IQ tests. It involves the ability to analyze, evaluate, judge, compare, and contrast information. It is crucial for academic problem-solving and critical thinking. An example would be a student dissecting a literary text to identify its central themes or a scientist evaluating the validity of an experiment.
2. Creative Intelligence ("Inventive Smarts"): This is the ability to go beyond what is given to

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generate novel and interesting ideas. It involves dealing effectively with new situations and finding unique solutions to problems. This is the intelligence that allows an artist to create an original painting or an entrepreneur to devise a new business model.

3. Practical Intelligence ("Street Smarts"): This is the ability to use, apply, and implement ideas in the real world. It involves adapting to, shaping, and selecting one's environment. People strong in practical intelligence are adept at navigating everyday challenges, understanding social dynamics, and getting things done. An example would be a manager who knows how to motivate a diverse team to meet a deadline or a person who can effectively negotiate the price of a car.

Sternberg's theory emphasizes that successful intelligence requires a balance of all three. A person might be analytically brilliant but lack the practical skills to implement their ideas, or be highly creative but unable to critically evaluate the quality of their own work.

The "Relevance vs. Rigor" Dilemma

The immense and enduring popularity of Gardner's and Sternberg's theories, particularly within the applied fields of education and business, reveals a fascinating tension in the world of psychometrics. While these models have been embraced by teachers and managers for their intuitive appeal and practical relevance, they have often been met with skepticism from the psychometric community due to a perceived lack of empirical rigor. This highlights a significant "relevance vs. rigor" gap between what practitioners find useful and what scientists find defensible.

Gardner's theory of multiple intelligences, for example, has had a profound impact on education.

It provides teachers with a powerful and optimistic framework for recognizing and nurturing the diverse talents of every student in their classroom. It validates the idea that a child who struggles with algebra might be a gifted artist or a natural leader, shifting the focus from deficits to strengths. Similarly, Sternberg's theory resonates deeply in the corporate world because it provides a language to explain a common observation: the straight-A student with a high IQ does not always become the most successful leader, while individuals with "street smarts" often rise to the top. These theories feel relevant because they align with real-world experiences.

From a strict psychometric standpoint, however, these models present significant challenges. Critics of Gardner's theory argue that many of his "intelligences" (such as musical or bodily-kinesthetic) are better classified as special talents or skills rather than broad intellectual capacities. Furthermore, they are notoriously difficult to measure with the same reliability and validity as traditional cognitive abilities, and there is limited empirical evidence showing that the intelligences are truly independent of one another. Sternberg's concepts of creative and practical intelligence have faced similar measurement hurdles, proving difficult to assess with standardized, objective tools.

This creates a dilemma. Psychometricians, as scientists, prioritize rigor: they demand that any construct be measurable in a reliable, valid, and empirically verifiable way. Practitioners, on the other hand, prioritize relevance: they need concepts and tools that are intuitive, applicable, and useful in their day-to-day work of teaching students or managing employees. The widespread adoption of these less psychometrically rigorous theories is a powerful signal that the field of traditional intelligence testing has, at times, failed to meet the practical needs of its end-users. It suggests a deep societal hunger for a more holistic, inclusive, and practically grounded understanding of intelligence—one that values the full range of human capabilities, even those that are difficult to capture with a number.

The research objective:

1. To ideate the general principles of psychometrics in terms of neurogenetics
2. Can neurogenetic cognitive psychological traits model can help in determining the psychological dimension of human traits in professional model
3. What are the psychometrics indices involved to categorise employees based on their neuro genome sequencing
4. Can neurogenetic testing can visualise the personality traits of employees
5. What are the different types of personality traits based on stress genes evaluation in neurogenetics
6. Can neurogenetics report can help in providing acute qualities of employees to ascertain roles of cognition and professional dimension and matrix.

The research questions:

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1. Does INGCPT framework can significantly influence to define the personality AND INTELLIGENCE of employees
2. Does stress genes in brain can significantly impact in tailoring job architecture to employees based on the neurogenetics profiling and intelligence
3. Does neurogenetic profiling has direct significance in determine the health related concerns in corporate settings
4. Can INGCPT model, big 5 model and varna system can significantly impact on the personality of employees behaviour and skills
5. Does neurogenetic profiling in employees ca be utilised to tailor the health insurance preference to employees by management

DISCUSSIONS AND HYPOTHESIS GENERATIONS

The Architecture of Intelligence Testing through neurogenetic testing

The measurement of intelligence, as we know it today, is a product of over a century of scientific innovation, refinement, and debate. The development of standardized intelligence tests marked a pivotal moment in psychology, providing the first objective tools to quantify cognitive abilities. This chapter traces the historical evolution of these instruments, focusing on the two most influential and widely used test batteries: the Stanford-Binet and the Wechsler scales.

INGCPT NEUROGENETIC COGNITIVE MODEL Core Neurogenic Factors Derived

Across the MedGenome reports attached in appendix and your Neurogenetic papers, the following stress/neuro-behaviour genes are consistently analysed:

- CRHR1, CRHR2 (HPA axis, cortisol regulation)
- NR3C1 (glucocorticoid receptor; resilience modulation)
- FKBP5 (regulates stress adaptation)
- SLC6A4 (5-HTTLPR) (serotonin transporter; emotional reactivity, anxiety)
- MAOA (emotion control, aggression modulation)
- BDNF (neuroplasticity, cognitive flexibility)
- COMT (dopamine regulation; executive function, stress cognition)
- TPH2 (serotonin synthesis; emotional stability)

Universal Neurogenic Trait Dimensions

Based on gene functions Neurogenic Trait Axes:

Neurogenic Axis	Dominant Genes	Behavioural Meaning
Stress Reactivity (SR)	CRHR1/2, FKBP5, NR3C1	How quickly one becomes stressed; resilience
Emotional Stability (ES)	SLC6A4, MAOA, TPH2	Mood balance, anxiety threshold, emotional recovery
Cognitive Flexibility (CF)	BDNF, COMT	Adaptability, reasoning, problem-solving
Impulse-Control Regulation (IC)	MAOA, COMT	Anger management, self-control
Social-Empathy Spectrum (SE)	SLC6A4, BDNF	Empathy, rapport formation
Motivational Drive (MD)	Dopamine pathways (COMT-related)	Ambition, initiative, perseverance

Mapping Neurogenic Traits ↔ Big Five

Neurogenic Axis	Big Five Mapping
Stress Reactivity (SR)	↔ Neuroticism (inverse)
Emotional Stability (ES)	↔ Neuroticism, Agreeableness
Cognitive Flexibility (CF)	↔ Openness, Conscientiousness
Impulse Control (IC)	↔ Conscientiousness
Social-Empathy (SE)	↔ Agreeableness, Extraversion
Motivational Drive (MD)	↔ Extraversion, Conscientiousness

Mapping Neurogenic Traits ↔ Varna / Guna System

Your INGCPT paper emphasises the combination of genes, cognition, and Gunas (Sattva-Rajas-Tamas).

Neurogenic Axis	Dominant Guna	Corresponding Varna
Cognitive Flexibility (CF)	Sattva	Brahmana (knowledge roles)

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Motivational Drive (MD)	Rajas	Kshatriya/Vaishya (leadership, business)
Stress Reactivity (SR)	Low Sattva or high Tamas	—
Impulse Control (IC)	Sattva–Tamas balance	Kshatriya
Social Empathy (SE)	Sattva	Brahmana / Vaishya
Emotional Stability (ES)	Sattva	All Varnas

Generalised Neurogenic Job-Style Assignment Matrix (Based on Gene Pattern → Behaviour → Role)

A. High Cognitive Flexibility (BDNF↑, COMT Balanced)

- High Openness
- Sattvika cognition
- Suited for:

Policy-making, Research, Law, Academia, Forensics, Negotiation, Strategy

B. High Emotional Stability (SLC6A4 stable, NR3C1 balanced)

- ✓ Calm under pressure
- ✓ Low Neuroticism
- ✓ Suited for:

HRM, Counselling, Mediation, Healthcare leadership

C. High Motivational Drive (COMT fast, dopamine-responsive)

- ✓ Rajas-dominant
- ✓ Suited for:

Entrepreneurship, Corporate leadership, Marketing, Operations, Crisis roles

D. High Impulse Control (MAOA balanced, COMT stable)

- ✓ High Conscientiousness
- ✓ Suited for:

Compliance, Legal drafting, Judiciary training, Audit roles, Ethics monitoring

E. High Social Empathy (SLC6A4 robust + BDNF stable)

- ✓ Agreeableness
- ✓ Suited for:

Teaching, Team leadership, HR, Client-facing roles, Welfare committees

6. Individual Neurogenic Matrix (from uploaded reports) APPENDIX 1

Clinical reports show:

No pathogenic variants in CRHR1, CRHR2, NR3C1, FKBP5, MAOA, COMT, BDNF, SLC6A4, TPH2 for all 4 persons

(Dr. Asha, Surya S, Girija, Dr. Meenakshi).

This means:

Normal genetic baseline

Behavioural differences come from epigenetics, personality, upbringing (as your paper states)

7. Historical Foundations: Binet's Practical Mission

The story of modern intelligence testing begins not in a research laboratory, but in the schools of early 20th-century Paris. The French government, having mandated universal education, was faced with a practical challenge: how to identify children who were unlikely to benefit from a standard curriculum and who required special educational support. In 1905, psychologist Alfred Binet and his colleague Théodore Simon were commissioned to develop a tool to address this need.

Their creation, the Binet-Simon Scale, was revolutionary. Rather than measuring learned information like a typical school exam, it assessed skills related to abstract reasoning, memory, and judgment. Crucially, Binet introduced the concept of Mental Age (MA), a score representing a child's level of intellectual functioning. A child's MA was determined by the age level of the most difficult items they could successfully answer. This allowed for a direct comparison between a child's intellectual development and their chronological age, providing a clear, practical indicator of their educational needs.

The Stanford-Binet Intelligence Scales

Binet's work quickly caught the attention of psychologists internationally. In the United States, Lewis Terman, a professor at Stanford University, saw the potential of the scale and undertook a major revision and standardization. In 1916, he published the Stanford-Binet Intelligence Scale, adapting the items for an American audience and developing norms based on a large sample of American children.

Terman's most significant contribution was the popularization of the Intelligence Quotient (IQ), a concept originally suggested by William Stern. By using the ratio of mental age to chronological age, the Stanford-Binet provided a single, easily interpretable score that became synonymous with intelligence itself.

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The Stanford-Binet has been revised multiple times over the decades to incorporate advances in psychometric theory and to update its norms. The current version, the Stanford-Binet 5 (SB-5), is a highly sophisticated instrument that reflects the modern hierarchical understanding of intelligence. It is grounded in the Cattell-Horn-Carroll (CHC) theory and assesses five core cognitive factors :

1. Fluid Reasoning: The ability to solve novel problems.
2. Knowledge: Accumulated information (crystallized intelligence).
3. Quantitative Reasoning: Mathematical problem-solving.
4. Visual-Spatial Processing: The ability to analyze and manipulate visual information.
5. Working Memory: The ability to hold and manipulate information in short-term memory. A key feature of the SB-5 is that each of these five factors is measured through both verbal and nonverbal subtests, resulting in ten core subtests. This dual-modality approach allows for a more comprehensive assessment and is particularly useful for individuals with language difficulties or from diverse linguistic backgrounds.

The Wechsler Intelligence Scales

While the Stanford-Binet was initially designed for children, psychologist David Wechsler recognized the need for a robust intelligence test specifically designed for adults. In 1939, he developed the Wechsler-Bellevue Intelligence Scale, which would later evolve into the Wechsler Adult Intelligence Scale (WAIS). Wechsler later developed parallel versions for children, the Wechsler Intelligence Scale for Children (WISC), and for young children, the Wechsler Preschool and Primary Scale of Intelligence (WPPSI).

Wechsler's tests introduced several key innovations. First, he conceptualized intelligence not just as a single number but as a "global capacity" composed of multiple, interrelated abilities. His tests were therefore organized into subtests that were grouped into two broad categories: Verbal and Performance (nonverbal). This provided not only an overall IQ score but also separate scores that could reveal important patterns of cognitive strengths and weaknesses. Second, Wechsler abandoned the MA/CA ratio for calculating IQ. He pioneered the use of the deviation IQ, a standard score that compares an individual's performance to the average performance of

their age-based norm group. This method, based on the statistical properties of the bell curve with a mean of 100 and a standard deviation of 15, provided a more stable and meaningful measure of intelligence, especially for adults.

The modern Wechsler scales (e.g., WAIS-V, WISC-V) have evolved to align with current CHC theory. They are structured around several index scores that provide a detailed cognitive profile

- Verbal Comprehension Index (VCI): Measures verbal reasoning, concept formation, and knowledge acquired from one's environment.
- Perceptual Reasoning Index (PRI) / Visual-Spatial Index (VSI): Measures nonverbal fluid reasoning, spatial processing, and visual-motor integration.
- Working Memory Index (WMI): Measures the ability to attend to, hold, and manipulate information in immediate awareness.
- Processing Speed Index (PSI): Measures the speed and accuracy of visual scanning and mental processing.

These indices, along with the Full-Scale IQ (FSIQ), make the Wechsler scales powerful tools for both general ability assessment and detailed clinical and neuropsychological diagnosis.

Other Measurement Techniques

Beyond the Stanford-Binet and Wechsler scales, which are administered individually, a variety of other intelligence testing formats exist :

- Group vs. Individual Tests: Individual tests (like the WAIS) allow for detailed behavioral observation but are time-consuming. Group tests (like the Army Alpha and Beta tests developed during WWI) are more efficient for large-scale screening.
- Verbal vs. Nonverbal (Performance) Tests: Verbal tests rely heavily on language, while nonverbal or performance tests use visual puzzles, mazes, or block designs. This distinction is crucial for fairly assessing individuals with hearing impairments, language disorders, or non-native language backgrounds.
- Culture-Fair Tests: In an effort to reduce the cultural bias inherent in many traditional tests, some instruments are designed to be "culture-fair." Raven's Progressive Matrices, for example,

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is a nonverbal test that requires examinees to identify the missing piece in a series of abstract patterns. It minimizes the influence of language and academic knowledge, aiming to measure pure fluid reasoning.

Intelligence in Action - Applied Case Studies

The true value of intelligence testing lies not in the scores themselves, but in how they are used to understand individuals and guide meaningful interventions. A well-interpreted cognitive profile can provide a roadmap for educators, a diagnostic key for clinicians, and a foundation for personal growth. The following hypothetical case studies illustrate how modern intelligence tests, such as the WISC-V and WAIS-IV, are applied in real-world settings to answer critical questions and improve lives.

Case Study 1: Educational Assessment - Identifying a Specific Learning Disorder with the WISC-V

Scenario: Leo is a bright and articulate 10-year-old boy in the fifth grade. His teacher reports that he is a star participant in class discussions, demonstrating a sophisticated vocabulary and a deep understanding of complex topics. However, his academic performance is inconsistent. He struggles significantly with reading fluency, spelling, and written assignments, which are often incomplete and filled with errors. Concerned about this discrepancy between his verbal ability and his written output, the school's student support team refers Leo for a psychoeducational evaluation to investigate a possible Specific Learning Disorder.

Assessment Process: A school psychologist administers a battery of tests, with the centerpiece being the Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V). The WISC-V is chosen for its ability to provide a detailed profile of a child's cognitive abilities across different domains, which is essential for identifying patterns of strengths and weaknesses associated with learning disorders.

Data Interpretation: Leo's WISC-V results reveal a striking pattern. His fictional scores are as follows:

- Full-Scale IQ (FSIQ): 112 (High Average)
- Verbal Comprehension Index (VCI): 125 (Superior)
- Visual-Spatial Index (VSI): 110 (High Average)
- Fluid Reasoning Index (FRI): 115 (High Average)
- Working Memory Index (WMI): 88 (Low Average)
- Processing Speed Index (PSI): 85 (Low Average)

The psychologist notes several critical findings. First, Leo's overall intellectual ability (FSIQ) is in the High Average range, confirming his teacher's observation that he is a capable student. His VCI score is in the Superior range, highlighting his exceptional verbal reasoning and knowledge. However, there is a statistically significant and clinically meaningful discrepancy between his high VCI and his Low Average scores on the WMI and PSI.

This specific cognitive profile—high verbal ability combined with weaknesses in working memory and processing speed—is a classic indicator of a Specific Learning Disorder in Reading, commonly known as dyslexia. The psychologist explains that Leo's brain is highly adept at understanding and reasoning with ideas (VCI), but it struggles with the lower-level cognitive processes required for efficient reading and writing. His weak working memory makes it difficult to hold sounds and letters in mind to decode words, and his slow processing speed makes the act of reading and writing a laborious, mentally taxing process. This explains why he can talk about complex ideas but cannot easily get them down on paper.

Outcome: Based on the WISC-V profile and supplementary academic testing, Leo is diagnosed with a Specific Learning Disorder with impairment in reading. This diagnosis is not a label of limitation but a key to unlocking support. The assessment results are used to develop an Individualized Education Program (IEP). Leo's IEP includes specific, evidence-based interventions and accommodations, such as:

- Extended time on tests and written assignments.
- Access to text-to-speech and speech-to-text software.
- Multisensory, structured literacy instruction to build his decoding skills.

The WISC-V did not just provide a score; it provided an explanation. It gave Leo, his parents, and his teachers a clear understanding of his unique learning profile and a data-driven plan to help him succeed.

Case Study 2: Clinical Assessment - Evaluating Cognitive Functioning Post-TBI with the WAIS-IV

Scenario: Maria is a 30-year-old accountant who was involved in a serious car accident six months ago, resulting in a moderate traumatic brain injury (TBI). While she has made a good physical recovery, she is struggling upon returning to work. She reports difficulty concentrating during long meetings, forgetting important details from client calls, and feeling that her thinking is

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"slower" than before the accident. Her employer has suggested a neuropsychological evaluation to better understand her current cognitive functioning and to determine appropriate workplace accommodations.

Assessment Process: A clinical neuropsychologist conducts a comprehensive evaluation that includes the Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV). The WAIS-IV is selected because its index structure is highly sensitive to the cognitive deficits commonly associated with TBI, particularly in the areas of working memory and processing speed.

Data Interpretation: Maria's WAIS-IV results provide a nuanced picture of her cognitive state.

Her fictional scores are:

- Full-Scale IQ (FSIQ): 105 (Average)
- Verbal Comprehension Index (VCI): 115 (High Average)
- Perceptual Reasoning Index (PRI): 108 (Average)
- Working Memory Index (WMI): 87 (Low Average)
- Processing Speed Index (PSI): 82 (Low Average)

The neuropsychologist interprets these scores in the context of Maria's high-level profession and estimated pre-injury functioning. Her FSIQ falls in the Average range, which might seem unremarkable. However, the significant "scatter" or variability between her index scores is clinically significant. Her VCI score is in the High Average range, suggesting that her crystallized verbal knowledge and long-term memory are well-preserved. This is a common finding after TBI, as these abilities are more resilient to injury.

In contrast, her scores on the WMI and PSI are significantly lower, falling in the Low Average range. This pattern is highly consistent with the known cognitive sequelae of TBI, which often disrupts attention, mental control, and the speed of information processing. Her subjective complaints of "slowness" and memory problems are objectively validated by these scores. Her difficulty in meetings is likely due to a reduced capacity to hold and manipulate auditory information (WMI), while her overall feeling of being slower is captured by the PSI. **Outcome:** The WAIS-IV profile is instrumental in several ways. First, it provides objective, quantifiable evidence of Maria's cognitive deficits, which is crucial for her disability claim and for securing workplace accommodations under the Americans with Disabilities Act (ADA). Second, it informs the development of a targeted cognitive

rehabilitation plan. The plan focuses on strategies to compensate for her weaknesses, such as using memory aids, breaking down complex tasks into smaller steps, and practicing attention-enhancing exercises. Finally, the results help Maria and her family understand that her struggles are a real consequence of her brain injury, not a lack of effort, which reduces her frustration and self-blame. The assessment provides a clear path forward for her recovery and professional readjustment.

The Scientific Assessment of Personality

While intelligence pertains to our cognitive abilities—what we can do—personality speaks to our characteristic patterns of thinking, feeling, and behaving—who we are. It is the enduring and organized set of traits that makes each individual unique. The scientific assessment of personality is one of the most complex and fascinating areas of psychometrics, seeking to map the intricate landscape of the human self. This section explores the major theories that have attempted to explain the structure of personality and the diverse array of tools, from objective questionnaires to projective techniques, designed to measure it. Through applied case studies, we will see how personality assessment provides critical insights in clinical, organizational, and forensic contexts.

Mapping the Self - An Introduction to Personality

Personality is a term used in everyday life to describe the essence of a person, but in psychology, it has a more formal and scientific meaning. One of the most influential definitions was provided by Gordon Allport, who described personality as "the dynamic organisation within the individual of those psychophysical systems that determine his unique adjustment to his environment". This definition captures several core tenets of the construct.

Key Characteristics of Personality

Allport's definition and subsequent theories highlight several fundamental characteristics of personality :

- **Psychophysical System:** Personality is not purely mental or purely biological; it is an integrated system of mind and body.
- **Dynamic Organization:** Personality is not a static collection of traits but an active, organized system that is constantly evolving and adapting.
- **Consistency:** While dynamic, personality also exhibits consistency. There are enduring patterns to how an individual behaves across different situations and over time. This predictability is

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what allows us to describe someone as, for example, "generally outgoing" or "typically cautious."

- Uniqueness: Each individual's personality is a unique configuration of traits and patterns. Even though we may share common traits, the specific combination and expression of those traits are unique to each person.
- Developmental Nature: Personality is not fixed at birth but develops over the lifespan through a complex interplay of genetic predispositions and environmental experiences.

Core Dimensions of Personality

To make the vast concept of personality scientifically manageable, psychologists have sought to identify its most fundamental dimensions. These are broad, overarching traits that can be used to describe the basic structure of personality across different individuals. Some of the most foundational dimensions include :

- Introversion–Extraversion: This dimension describes an individual's orientation toward the internal world of thoughts and feelings (introversion) versus the external world of people and activities (extraversion). Extraverts are typically sociable, assertive, and outgoing, while introverts are more reserved, thoughtful, and introspective.
- Neuroticism–Emotional Stability: This dimension relates to an individual's tendency to experience negative emotions. Those high in neuroticism are more prone to anxiety, worry, moodiness, and stress. In contrast, those high in emotional stability are generally calm, resilient, and even-tempered.
- Locus of Control: This refers to an individual's beliefs about the extent to which they can control the events that affect them. Individuals with an internal locus of control believe they are in charge of their own destiny, while those with an external locus of control believe that their lives are governed by outside forces like luck or fate.

These core dimensions serve as a basic vocabulary for understanding the structure of personality and provide the foundation for the more complex trait theories discussed in the following chapters.

Probing the Unconscious - Psychoanalytic Perspectives

Long before personality was measured with questionnaires and statistics, it was explored through the deep, often turbulent waters of the unconscious mind. The psychoanalytic perspective, pioneered by Sigmund Freud, was the first comprehensive theory of personality. It proposed that our behavior, thoughts, and emotions are powerfully shaped by unconscious motives, internal conflicts, and the lingering effects of early childhood experiences.

Universal Neuro-Genetic Matrix (INGCPT-SETEHA Compatible)

This model basically can be defined as neurogenetic varna personality traits psychometric model that can be utilised in corporate setting to cluster employees based on their stress predispositions and the reactant values in calculating the stress with variable formulas, thus the below universal neurogenetic axis can ideally be provided to address and cluster employees to assign the work based on their neurogenetic profiling and the step by step process has been explained below to foresee the entire process for company having more employees around 1 lakhs.

This is your standardised matrix usable globally:

NEUROGENIC AXIS	LOW EXPRESSION	MODERATE EXPRESSION	HIGH EXPRESSION	JOB STYLE	BIG FIVE	GUNA/VARRNA
Stress Reactivity	High anxiety	Stable with support	Calm, resilient	Crisis management, law enforcement	Neuroticism ↓	Sattva/Kshatriya
Emotional Stability	Mood fluctuations	Average	Strong emotional balance	HR, counselling	Neuroticism ↓ Agreeableness ↑	Sattva
Cognitive Flexibility	Rigid thinking	Average reasoning	Creative, strategic	Research, judiciary, policy	Openness ↑	Sattva/Brahmana
Impulse Control	Impulsive	Controlled	Highly disciplined	Compliance, audit, legal drafting	Conscientiousness ↑	Tamas-Sattva
Social Empathy	Low empathy	Team-capable	High empathy	Teaching, HR, leadership	Agreeableness ↑	Sattva/Brahmana
Motivation/Drive	Passive	Consistent	High ambition	Entrepreneurship, management	Extraversion ↑	Rajas/Kshatriya-Vaisya

Decision rules — how a single Varna is assigned from genetics + Big-5

(Use WSGI (Weighted Stress Gene Index) and HSCI (HPA-Serotonergic Composite Index) from your model plus Big-5 dominance.)

Thresholds (based on the scoring system)

- Very Low: WSGI ≤ 0.10 and HSCI ≤ 0.05
- Low: WSGI 0.11–0.40 and HSCI 0.051–0.20
- Moderate: WSGI 0.41–1.00 and HSCI 0.201–0.40
- High: WSGI 1.01–2.00 and HSCI 0.401–0.70
- Very High: WSGI > 2.00 or HSCI > 0.70

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Single-Varna mapping rules (deterministic, single label — no hybrids):

- **Brahmin (Knowledge / Strategy)**
Assigned when stress predisposition is Very Low (WSGI ≤ 0.10 & HSCI ≤ 0.05) AND Big-5 shows high Conscientiousness and/or high Openness (suits research/strategy). Genetics: no stress variants; high BDNF/COMT adaptive profile.
- **Vaishya (Commerce / Management)**
Assigned when Low stress predisposition AND Big-5 shows high Conscientiousness and Agreeableness or moderate Extraversion. Genetics: balanced stress genes, fast recovery.
- **Kshatriya (Execution / Operations / Crisis-response)**
Assigned when Moderate \rightarrow High stress predisposition but fast recovery (NR3C1 low-sensitivity / low HSCI) or COMT pattern favouring quick decision under pressure. Big-5: higher Extraversion and moderate Neuroticism accepted. This varna is for people who can operate under pressure.
- **Shudra (Support / Service / Skilled-execution)**
Assigned when Moderate \rightarrow High stress predisposition with slower recovery (higher NR3C1 sensitivity or elevated HSCI) and Big-5 shows lower Openness but higher Agreeableness. Suited for steady, structured service roles rather than high-pressure leadership.

Note: If genetic indices and Big-5 conflict, the decision rule gives priority to WSGI/HSCI (genetic stress tolerance) for varna assignment, then breaks ties with Big-5.

2) Enterprise tabulation schema & pipeline (how to apply this for 100,000 employees)

A. Data model (one row per employee)

Columns to collect & store (recommended canonical names):

1. `employee_id`
2. `sample_id` / `genetic_report_id` (link to raw report).
3. `consent_flag` (Y/N) — documented, timestamped

4. `WSGI` (numeric) — per your scoring algorithm.
5. `WSGI_category` (Very Low/Low/Moderate/High/Very High)
6. `HSCI` (numeric) — per your scoring algorithm.
7. `HSCI_category`
8. `Genes`: `CRHR1_status`, `CRHR2_status`, `NR3C1_status`, `FKBP5_status`, `SLC6A4_status`, `MAOA_status`, `BDNF_status`, `COMT_status`, `TPH2_status` (values: NoVariant / Benign / VUS / Pathogenic). (Pull directly from MedGenome structured fields).
9. `NR3C1_note` (e.g., p.Ala49Val — benign) (if present).
10. `Big5_O`, `Big5_C`, `Big5_E`, `Big5_A`, `Big5_N` (0–100 or 0–1 scale)
11. `Dominant_Big5` (e.g., `High_C`)
12. `Assigned_Varna` (Brahmin / Vaishya / Kshatriya / Shudra)
13. `Recommended_Role_Tier` (examples: Strategy / Leadership / Ops / Service / Creative)
14. `Counselling_flag` (Y/N) (if BRM or high genetic sensitivity)
15. `Notes` (clinical incidental variants e.g., HTRA1 finding)
16. `Timestamp` / `analyst_id`

B. Processing pipeline (high level)

1. Consent & legal check — every record must have documented informed consent for genetic use in workplace profiling. (Mandatory.)
2. Ingest raw MedGenome structured outputs (JSON/CSV) to a secure staging database. (Use SFTP or secure API).
3. QC & coverage check — confirm gene coverage % and no missing key genes (exclude or flag if coverage $< 95\%$). (Reports show 99%+ coverage in your samples — good).
4. Calculate WSGI & HSCI using the scoring algorithm from your neurogenetic paper. (Same formulas used to derive WSGI for Girija etc.).
5. Map gene variants into status fields (Benign / VUS / Pathogenic). Use ACMG rules. (Reports already applied ACMG classification.)
6. Survey / psychometrics — collect Big-5 scores and feed them into mapping rule.
7. Apply decision rules (section 1) to produce `Assigned_Varna` & `Recommended_Role_Tier`.

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8. Flag counselling needs and incidental pathogenic variants. (E.g., HTRA1 in Girija flagged for clinical correlation).
9. Output role-recommendation report (encrypted) + aggregate dashboards (anonymized) for workforce planning.
10. Human review for borderline cases, appeals & HR compliance.

C. Scalability & technology

- Use a distributed ETL (Airflow/Prefect) + secure data lake (S3 with server-side encryption) + role-based access.
- Run WSGI/HSCI calculations in batch (Spark or Python) — can process 100k rows easily.
- Provide HR dashboards (aggregates only) — never expose individual genetic details to line managers.

3) Applied matrix — your 4 participants (single varna each) — source & reasoning

Data summary (sources: clinical reports + neurogenetic paper).

Person	Key genetic / WSGI & HSCI	Big-5 (summary)	Assigned single Varna	Rationale & Recommended Job Specialisation
Prof Dr. Asha Sundaram	No stress pathogenic variants ; WSGI = 0.000; HSCI = 0.000 (Very Low).	Very high Conscientiousness, high Agreeableness, low Neuroticism (leadership profile noted earlier).	Kshatriya	Very Low genetic stress predisposition + high C → suited to Strategy / Policy / Legal-Governance / Executive roles. (Recommend: Senior leadership, legal policy,

				governance .)
Dr. Meenakshin	No pathogenic variants ; WSGI = 0.000; HSCI = 0.000 (Very Low).	Moderate Openness, high Agreeableness.	Vaishya	Low stress predisposition plus social/coordination Big-5 → suited to Management / HR / Training & Development / Program management. (Recommend: Team-lead, program manager, training.)
Surya S.	No pathogenic variants ; WSGI = 0.000; HSCI = 0.000 (Very Low).	High Openness, high Conscientiousness, low Extraversion, low Neuroticism (analytical)	Brahmin	Very Low genetic stress risk + analytic Big-5 → Research / Strategy / Data / Legal analysis. (Recommend: Research lead, policy analyst, R&D.)
Girija Anil Kumar	NR3C1 p.Ala49 Val (benign); HTRA1 heterozygous	Moderate OCEAN mix; slight sensitivity noted by analysis.	Shudra	Low but non-zero WSGI and NR3C1 benign variant + incidental HTRA1 → assign to

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	nonsense (incidental); WSGI = 0.136 (Low); HSCI = 0.050 (Low).			Support / Service / Structured roles where workload is steady and clinical follow-up recommended. (Recommend: Operations support, documentation, admin). Counsel recommended for HTRA1 clinical correlation.
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Notes / citations: The WSGI/HSCI numbers and the single-varna logic used above derive from the analysis file summarizing the four MedGenome reports and the WSGI/HSCI thresholds. See combined analysis (VER journal / neurogenetic paper) for the numeric values and how the scores were derived. The four clinical reports confirm the lack of pathogenic stress-gene variants in three participants and the NR3C1 p.Ala49Val (benign, high MAF) + HTRA1 incidental in Girija.

4) Special/clinical flags (must be actioned before HR decisions)

- Girija: incidental heterozygous nonsense variant in HTRA1 (c.1120G>T, p.Gly374Ter) — clinical correlation advised (not a stress gene per se). Do not use incidental medical variants for role allocation — instead route to clinical genetic counselling.
- NR3C1 p.Ala49Val in Girija is reported as benign / high MAF — noted in reports but not a pathological finding; used only as mild modifier in WSGI.

5) Legal / ethical safeguards (must be implemented if you roll out to ~100k employees)

1. Explicit written consent for: genetic testing, use-case (wellness/role-fit), retention & sharing rules. (Mandatory.)
2. Prohibit use of genetic data for hiring, firing, promotion, pay decisions, or punishment (to avoid discrimination). Use only for voluntary wellness/role-fit guidance and accommodations.
3. Data minimisation & encryption — store only derived indices (WSGI/HSCI/assigned varna) in HR systems; raw VCF/clinical reports in separate, highly restricted clinical vault.
4. Clinical pathway — any incidental pathogenic variant requires clinical counselling & opt-out from HR profiling until clearance. (e.g., Girija’s HTRA1).
5. Independent ethics review & legal counsel before deployment (labour law / privacy law, India and other jurisdictions).
6. Aggregate reporting only to HR leaders (no personal genetic details).
7. Appeals and human review for every assignment.

Conclusion: This model is framework/heuristic — genetics can influence tendencies but do not deterministically define behaviour, capability, or worth. Use this model for voluntary wellness, training, and role-fit guidance only, combined with psychometrics and performance data — and always with lawful, documented consent. The assignments above are based on the reports and the WSGI/HSCI system in your analysis files.

I. FOUNDATIONAL MODEL: EXTENDING UNG-CM TO VĀRṆA + NEUROGENETICS

UNG-CM Traits

- Stress = SR + AR (Stress Reactivity + Adaptation Response)
- Emotion = ES + ER_i
- Cognition = CF + NP
- Impulse = IC
- Empathy = ES + NP

Now we integrate Genetic Stress Markers:

Gene	Function (from your paper)	Influence on UNG-CM
CRHR1 / CRHR2	HPA Axis, cortisol reactivity	↑ SR (Stress Reactivity)
NR3C1	Glucocorticoid receptor sensitivity	↑/↓ AR (Adaptation)

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FKBP5	Stress adaptation, trauma susceptibility	↓ AR if dysregulated
SLC6A4 (5-HTTLPR)	Serotonin transport, anxiety	↑ SR, ↓ ES stability
MAOA	Emotional regulation & aggression	Affects IC + ES
COMT	Dopamine metabolism & executive performance	Influences CF
BDNF	Neuroplasticity, resilience	↑ AR + NP
TPH2	Serotonin synthesis	Affects ES, mood regulation

- Strategy leadership
- Compliance & risk management

Counselling Need:

Low. Annual evaluation only.

CLUSTER 2: “RAJAS–PERFORMERS”

SGS: 2–3 (Moderate Stress Sensitivity)

UNG-CM: High CF, high ES

Traits: Fast execution, goal-driven

Genes: Normal serotonin regulation; moderate SLC6A4 variability

Job Varna:

KSHATRIYA

- Operations
- Sales
- Management roles
- Crisis handling

Counselling Need:

Quarterly performance-stress balance sessions.

CLUSTER 3: “RAJAS–TAMAS BALANCED THINKERS”

SGS: 3 (Moderate)

UNG-CM: Moderate SR, High empathy

Traits: Good at communication, people-facing roles

Genes: SLC6A4 mild sensitivity, MAOA moderate

Job Varna:

VAISHYA–BRAHMANA

- HR
- Customer relations
- Training
- Negotiation & mediation

Counselling Need:

Monthly emotional fitness coaching.

CLUSTER 4: “TAMAS–SENSITIVE EMPATHS”

SGS: 3.5–4 (Moderately High)

UNG-CM: High ES, high IC

Traits: Emotional, creative, sensitive to stress

Genes: High SLC6A4 sensitivity, lower NR3C1 adaptation

Job Varna:

SHUDRA–CREATIVE DIVISION

- Creative design
- Arts
- Support functions
- Assisted-project tasks

Counselling Need:

Bi-weekly mindfulness, stress-modulation therapy.

II. CREATE STRESS-GENE SCORE (SGS) FROM REPORTS

All three MedGenome reports show no pathogenic variants, meaning no high-risk genetic dysfunction. However, for organisational clustering we assume:

SGS = (HPA Axis Reactivity + Serotonin Stability + Dopamine Stability + Neuroplasticity Index)

Each gene contributes:

- CRHR1/2 → 25%
- SLC6A4 → 20%
- MAOA → 15%
- COMT → 15%
- NR3C1 → 10%
- FKBP5 → 10%
- BDNF/TPH2 → 5%

Score range: 1–5 (Low to High Stress Sensitivity)

III. CLUSTERING FOR 1 LAKH EMPLOYEES (MAIN OUTPUT)

Using SGS, UNG-CM, Big Five and Varna Model → we form 6 major clusters.

CLUSTER 1: “SATTVA–RESILIENT LEADERS”

SGS: 1–2 (Low Stress Sensitivity)

UNG-CM: High AR, High CF, High NP

Traits: Calm, strategic, strong decision-making

Genes: Stable CRHR1/2, COMT, BDNF pathways

Job Varna

BRAHMANA–KSHATRIYA

- Policy advisors
- Legal research

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CLUSTER 5: “HIGH-STRESS REACTIVE GROUP”

SGS: 4–4.5

UNG-CM: High SR, low AR

Traits: Quick burnout risk

Genes: CRHR1/2 high activity, FKBP5 dysregulation tendency

Job Varna:

SHUDRA (Structured, repetitive tasks)

- Back-end operations
- Data entry
- Fixed-process roles

Counselling Need:

Weekly neurocognitive resilience sessions.

Workload capping mandatory.

CLUSTER 6: “CRISIS-RISK GROUP (RED ZONE)”

SGS: 4.5–5

UNG-CM: High SR + High IC

Traits: Prone to conflict, aggression, emotional overload

Genes: MAOA variability + serotonin instability

Job Varna:

Protected roles only

- Non-stress, non-customer-facing
- Wellness monitored operations
- Support functions

Counselling Need:

Weekly counselling + psychometric monitoring.

Direct manager training required.

IV. ASSIGNING JOB VARNA FROM NEUROGENETICS

UNG-CM Trait	Gene Influence	Varna Mapping
High cognition (CF+NP)	COMT, BDNF	Brahmana
High courage/drive (SR low + AR high)	CRHR1/2, NR3C1	Kshatriya
High social-emotional (ES + empathy)	SLC6A4, TPH2	Vaishya
High impulse/creativity	MAOA, SLC6A4	Shudra

Formula:

$$\text{Varna Index} = (\text{Cognition} \times 0.4) + (\text{Stress Adaptation} \times 0.3) + (\text{Empathy} \times 0.2) + (\text{Impulse Control} \times 0.1)$$

The Building Blocks of Identity - Trait Theories

While psychoanalytic theories delved into the hidden depths of the unconscious, another major school of

thought in personality psychology took a more direct and empirical approach. Trait theory is focused on identifying, describing, and measuring the stable and enduring characteristics—or traits—that are the fundamental building blocks of personality. A trait is a relatively consistent pattern of thought, feeling, and behavior that a person exhibits across a variety of situations. This perspective assumes that by measuring these core traits, we can understand individual differences and predict future behavior.

Allport's Trait Hierarchy

One of the earliest pioneers of this approach was Gordon Allport. He began his work with a lexical hypothesis—the idea that all important personality traits would eventually become encoded in a culture's language. By meticulously combing through an English dictionary, he and his colleagues identified over 4,500 words describing personality traits. To bring order to this vast list, Allport organized traits into a hierarchy of three levels :

1. Cardinal Traits: These are rare but extremely dominant traits that shape a person's entire life and behavior. A person with a cardinal trait is so known for it that their name might become synonymous with that quality (e.g., Machiavellian, Christ-like).
2. Central Traits: These are the 5 to 10 major characteristics that form the core of an individual's personality. They are the traits you would likely use to describe a close friend, such as "intelligent," "honest," "shy," or "anxious."
3. Secondary Traits: These are more specific attitudes or preferences that appear only in certain situations or under particular circumstances. For example, a person might become anxious when speaking in public, even if they are not a generally anxious person.

Cattell's 16 Personality Factors (16PF)

Psychologist Raymond Cattell brought a new level of scientific rigor to trait theory. He believed that a truly scientific model of personality must be grounded in empirical data. Using the statistical technique of factor analysis, Cattell analyzed vast amounts of data from different sources (including self-reports and observations) to identify the underlying dimensions of personality.

His research led him to distinguish between two levels of traits :

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- **Surface Traits:** Observable patterns of behavior that are the superficial expression of personality (e.g., being sociable at a party).
- **Source Traits:** The fundamental, underlying dimensions of personality that give rise to surface traits. Cattell believed these were the true building blocks of personality.

Through extensive factor analysis, Cattell identified 16 key source traits. He developed the Sixteen Personality Factor Questionnaire (16PF) to measure these dimensions, providing a detailed, nuanced profile of an individual's personality. The table below outlines these 16 factors.

Table 2: Cattell's 16 Personality Factors (16PF)

Primary Factor	Low Score Descriptors	High Score Descriptors
Warmth (A)	Impersonal, Reserved, Distant	Warm, Outgoing, Attentive to Others
Reasoning (B)	Concrete-Thinking, Less Intelligent	Abstract-Thinking, More Intelligent
Emotional Stability (C)	Reactive, Emotionally Less Stable	Emotionally Stable, Adaptive, Calm
Dominance (E)	Deferential, Cooperative, Submissive	Dominant, Forceful, Assertive
Liveliness (F)	Serious, Restrained, Prudent	Lively, Animated, Spontaneous
Rule-Consciousness (G)	Expedient, Nonconforming	Rule-Conscious, Dutiful, Conforming
Social Boldness (H)	Shy, Timid, Threat-Sensitive	Socially Bold, Venturesome, Uninhibited
Sensitivity (I)	Utilitarian, Tough-Minded	Sensitive, Tender-Minded, Intuitive
Vigilance (L)	Trusting, Unsuspecting, Accepting	Vigilant, Suspicious, Skeptical
Abstractedness (M)	Grounded, Practical,	Abstract, Imaginative,

	Conventional	Impractical
Privateness (N)	Forthright, Open, Genuine	Private, Discreet, Nondisclosing
Apprehension (O)	Self-Assured, Confident, Secure	Apprehensive, Self-Doubting, Worried
Openness to Change (Q1)	Traditional, Conservative	Open to Change, Experimental,
Primary Factor	Low Score Descriptors	High Score Descriptors
		Liberal
Self-Reliance (Q2)	Group-Oriented, Follower	Self-Reliant, Solitary, Individualistic
Perfectionism (Q3)	Tolerates Disorder, Undisciplined	Perfectionistic, Organized, Self-Disciplined
Tension (Q4)	Relaxed, Placid, Patient	Tense, High-Energy, Impatient

(Source: Adapted from)

Eysenck's PEN Model

While Cattell identified 16 factors, psychologist Hans Eysenck argued for a more parsimonious model. Using a higher-order factor analysis, he proposed that personality could be understood in terms of just three broad, biologically-based "superfactors". His PEN model includes:

1. **Psychoticism vs. Socialisation (P):** This dimension is not about psychosis in the clinical sense. Rather, individuals high in psychoticism tend to be independent thinkers, cold, nonconformist, impulsive, antisocial, and hostile. Those low on this dimension are more altruistic, empathetic, and conventional. Eysenck linked this dimension to hormonal levels, particularly testosterone.
2. **Extraversion vs. Introversion (E):** This dimension describes sociability, assertiveness, and sensation-seeking. Eysenck theorized that this trait is linked to an individual's baseline level of cortical arousal. Extraverts have low baseline arousal and thus seek out external stimulation, while introverts have high baseline arousal and tend to avoid intense stimulation.

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3. Neuroticism vs. Emotional Stability (N): This dimension reflects emotional instability and a tendency to experience negative emotions like anxiety and depression. Eysenck linked neuroticism to the reactivity of the autonomic nervous system. Individuals high in neuroticism have a more reactive nervous system and are more susceptible to stress. Eysenck's model was influential for its strong emphasis on the biological and genetic underpinnings of personality, providing a bridge between psychology and physiology.

Case Study 3: Forensic Setting - Assessing Competency to Stand Trial

Scenario: Mr. Jones, a 45-year-old man with a history of homelessness and untreated mental illness, is arrested for a felony assault. During his initial court appearances, he is non-communicative, exhibits disorganized speech, and makes bizarre statements about being monitored by government agencies. His public defender raises a doubt about his competency to stand trial (CST), and the court orders a forensic psychological evaluation.

Assessment Process: A forensic psychologist is appointed to evaluate Mr. Jones. The legal standard for competency, established in the U.S. Supreme Court case *Dusky v. United States*, is twofold: the defendant must have (1) a rational as well as factual understanding of the legal proceedings against them, and (2) the ability to consult with their lawyer with a reasonable degree of rational understanding.

The assessment is a multi-method process, including:

- A thorough review of legal and medical records.
- A semi-structured clinical interview focused on the specific legal abilities outlined in the Dusky standard.
- Administration of a competency assessment instrument (e.g., the MacArthur Competence Assessment Tool).
- Potentially, personality testing (like the MMPI-2) to clarify underlying psychopathology.

Data Interpretation: During the evaluation, the psychologist makes several key findings. While Mr. Jones has a factual understanding of the roles of the judge and prosecutor (he can identify them correctly), his understanding is distorted by severe paranoid delusions. He believes his defense attorney is secretly working for

the government agencies that are "monitoring" him. He is therefore unwilling to share any information about the alleged crime, as he believes his lawyer will use it against him.

His responses reveal a profound impairment in the second prong of the Dusky standard: the ability to rationally assist counsel. His paranoid psychosis prevents him from forming a trusting, working relationship with his attorney, which is essential for mounting a defense.

Outcome: The forensic psychologist concludes in their report to the court that, due to his active psychotic symptoms, Mr. Jones is not currently competent to stand trial. This is not a judgment on his guilt or innocence, nor is it an insanity defense. It is a statement about his present inability to participate meaningfully in the legal process. Based on this expert opinion, the judge orders that Mr. Jones be committed to a state forensic hospital for competency restoration. There, he will receive psychiatric treatment (including antipsychotic medication) and psychoeducation about the legal system. The goal is to restore him to a state where he can understand the proceedings and rationally assist his attorney. His legal case is put on hold until his competency is restored. This case illustrates how psychological assessment plays a crucial role in safeguarding the due process rights of individuals with severe mental illness within the justice system.

Conclusion: The Responsible Application of Psychometric Tools

This exploration of the practical applications of psychometrics has journeyed through the intricate landscapes of human intelligence and personality, revealing the profound impact that their measurement has on individuals and institutions. From the classroom to the clinic, the workplace to the courtroom, psychometric tools provide a scientific language to describe and quantify the very qualities that make us human. We have seen how theories of intelligence have evolved from a singular focus on a general factor (g) to embrace a rich tapestry of multiple cognitive and emotional abilities. Similarly, our understanding of personality has progressed from the hidden depths of the Freudian unconscious to the empirically-derived, stable traits that predict our behavior in the world

Psychometric Neurogenetic varna cognitive personality traits model

Neurogenetic Psychometrics of Stress: A Multidimensional Framework for Intelligence, Personality, and Adaptability

To address stress predispositions and job specifications based on gene of brains under stress

COMPLETE 10-STEP PROCESS TO APPLY THIS FOR 1,00,000 EMPLOYEES

STEP 1: Consent & Ethical Protection (SETEHA Rules)

Mandatory privacy and genomic consent.

STEP 2: Collect Non-invasive Data

Not genetic. Use questionnaires + UNG-CM psychometrics.

STEP 3: Create UNG-CM Score for Each Employee

5 traits → combined vector P = (O,C,E,A,N).

STEP 4: Run Stress Gene Score (Based on your research model)

SGS = 1–5 assigned via psychological stress markers.

STEP 5: Cluster Employees Using K-Means (k=6)

Clusters defined above.

STEP 6: Map Each Cluster → Varna Job Category

STEP 7: Map Varna → Job Role Dictionary

Example:

- Brahmana → Knowledge, advisory, R&D
- Kshatriya → Execution, leadership
- Vaishya → Social, negotiation
- Shudra → Process, creative, support

STEP 8: Assign Counselling Frequency

STEP 9: Create Workforce Deployment Matrix

To ensure:

- Burnout prevention
- Cluster balancing
- Crisis mitigation

STEP 10: Continuous Re-evaluation Every 6 Months

UNG-CM traits update

Counselling response update

VI. ORGANISATION-WIDE DEPLOYMENT MATRIX

Cluster	Size %	Counselling	Core Jobs	Risk
1	10 %	Annual	Strategy • Legal • R&D	Very Low
2	20 %	Quarterly	Ops • Sales • Admin	Low

3	25 %	Monthly	HR Negotiation	Moderate
4	20 %	Bi-weekly	Creative Support	Medium
5	15 %	Weekly	Backend Repetitive	High
6	10 %	Weekly + Intensive	Protected roles	Critical

VII. FINAL OUTPUT YOU REQUESTED: “CLUSTER NAMES + VĀRṆA + JOB ASSIGNMENT”

Cluster Name	Varna	Jobs
C1: Sattva-Resilient Leaders	Brahmana–Kshatriya	Leadership, Policy
C2: Rajas-Performers	Kshatriya	Operations, Sales
C3: Balanced Thinkers	Vaishya–Brahmana	HR, Client-facing
C4: Sensitive Empaths	Shudra–Creative	Design, Support
C5: Stress-Responsive Workers	Shudra	Backend, BPO
C6: Crisis-Risk Protected Group	Special Shudra	Low-stress roles

– UNIVERSAL NEUROGENETIC MATRIX (MASTER TABLE)

Gene	Neural Function	Formula	Derived Trait	Big Five Mapping
CRH R1/2	HPA stress regulation	$SR = \alpha(CRH_{R1} + CRHR2)$	Stress Reactivity	Neuroticism
NR3 C1	Cortisol receptor	$ES = \beta / NR3C1$	Emotional Stability	Neuroticism ↓
FKBP5	Stress recovery	$AR = FKBP5 \cdot NR3C1$	Resilience	Emotional Stability
SLC6A4	Serotonin transport	$ES = SLC6A4 / (1 + EM)$	Emotional Balance	Agreeableness

Neurogenetic Psychometrics of Stress: A Multidimensional Framework for Intelligence, Personality, and Adaptability

MAOA	Breakdown of norepinephrine, dopamine	IC = 1/MAOA	Impulse Control	Conscientiousness
COMT	Dopamine metabolism	CF = λ \cdot COMT	Executive function	Openness
BDNF	Neural plasticity	NP = BDNF(1-EM)	Adaptability, Creativity	Openness
TPH2	Serotonin synthesis	ER _t = η \cdot TPH2	Emotional Patience	Agreeableness

The general output that we obtain from medgenome testing could help in deriving the standard NGCPT AND SEETHA framework for job fit prediction and health evaluation based on their genetic traits and stress predispositions thus the general role of neurogenetic process that can ideally help in clustering employees and making them undergo the suitable fit job based neurogenetic matrix varna model . Complete Universal Matrix

Axis	Formula	Personality Output	Big Five	Guna	Varna
Stress Reactivity	SR = α (CRHR1+CRHR2)	Sensitivity	N	Tamas	—
Emotional Stability	ES = 1/NR3C1 + SLC6A4	Calmness	N ↓, A ↑	Sattva	All
Cognitive Flexibility	CF = COMT + BDNF	Creativity, Logic	O ↑	Sattva	Brahmana

(As you shared earlier)

$$Trait_{Stress} = SR + AR$$

$$Trait_{Emotion} = ES + ER_t$$

$$Trait_{Cognition} = CF + NP$$

$$Trait_{Impulse} = IC$$

$$Trait_{Empathy} = ES + NP$$

Where the gene reports fit:

Because no pathogenic variants were found, all employees tested receive:

GENETIC BASELINE (GB) = 1.0 (Neutral/Normal)

Meaning:

- No additional stress-risk amplification
- No emotional dysregulation gene loading
- No impulse-control risk allele
- No cognitive deficit gene load

Thus:

$$Stress\ Level = SR + AR + (GB)$$

Where **GB = 1.0** (constant neutral baseline).

Impulse Control	IC=1/MAOA	Discipline	C ↑	Tamas-Sattva	Kshatriya
Empathy	SE = SLC6A4 + NP	War mth	A ↑	Sattva	Brahmana/Vaishya
Motivation	MD = COMT_{dopamine}	Drive, Leadership	E ↑	Rajas	Kshatriya/Vaishya

The case studies presented throughout this report underscore a vital message: psychometric instruments are far more than mere academic curiosities. They are powerful tools that, when used correctly, can diagnose a learning disorder and unlock a potential, provide clarity

Neurogenetic Psychometrics of Stress: A Multidimensional Framework for Intelligence, Personality, and Adaptability

in a complex clinical case, guide an aspiring leader toward self-awareness, and ensure that the rights of the most vulnerable are protected within the legal system. The scores, profiles, and indices generated by these tests provide objective data that can challenge subjective biases, inform evidence-based interventions, and lead to more effective and equitable decisions. However, this power comes with immense responsibility. The history of psychometrics is not without its controversies, and the potential for misuse remains a constant concern. A single test score, viewed in isolation and without context, can lead to harmful labels and limited opportunities. The insights from this report converge on a set of core principles for the responsible application of these tools:

1. **A Holistic, Multi-Method Approach is Essential:** No single test can ever capture the full complexity of an individual. A responsible assessment always integrates data from multiple sources—test scores, clinical interviews, behavioral observations, and life history—to form a comprehensive and nuanced understanding.
2. **Context is Paramount:** Test results are meaningless without context. The assessor must always consider the individual's cultural background, educational history, emotional state, and the specific circumstances of the assessment.
3. **Scientific Rigor Must Be Upheld:** The use of any psychometric tool must be grounded in the principles of reliability, validity, and standardization. Practitioners have an ethical obligation to use tests that are scientifically sound and appropriate for the population and purpose at hand.
4. **The Goal is Understanding, Not Just Labeling:** The ultimate purpose of psychological assessment should be to foster understanding, guide support, and empower individuals. The results should be used to open doors, not to close them.

As the field of psychometrics continues to evolve, the integration of technology, artificial intelligence, and neuroscience promises to make our assessment tools even more precise and insightful. Yet, the fundamental ethical and scientific principles will remain unchanged. The measure of the mind is a delicate and profound task, and its responsible practice will continue to be one of the

most important contributions that psychology offers to society.

Combined Neurogenetic x Big Five x Stress Index Chart

Person	Neurogenetic Profile	Big Five Summary	Stress Index (WSGI/HSCI)
Surya	Calm Analytical Neurotype	High O, High C, Low E, Low N	0.000 / 0.000 (Very Low)
Asha	Executive Stabiliser Neurotype	Moderate O, Very High C, High A, Low N	0.000 / 0.000 (Very Low)
Meenakshi	Harmoniser Coordinator Neurotype	Moderate O, High A, Low N	0.000 / 0.000 (Very Low)
Girija	Steady Support Neurotype	Moderate OCEAN mix	0.136 / 0.050 (Low)

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APPENDIX 1

MedGenome Labs Ltd.

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Tel : 1800 296 9696, Web: www.medgenome.com



DNA TEST REPORT - MEDGENOME LABS

Full Name / Ref No:	GIRIJA ANIL KUMAR	Order ID/Sample ID:	1458644/9415294
Gender:	Female	Sample Type:	Blood
Date of Birth / Age:	51 years	Date of Sample Collection:	24 th September 2025
Referring Clinician:	Dr. Asha Sundaram, Saveetha School of Law, Chennai	Date of Sample Receipt:	25 th September 2025
		Date of Order Booking:	25 th September 2025
		Date of Report:	11 th November 2025
Test Requested:	Whole Exome Sequencing		

CLINICAL DIAGNOSIS / SYMPTOMS / HISTORY

Ms. Girija Anil Kumar is suspected to harbour mutations in *CRHR1*, *CRHR2*, *NR3C1*, *FKBP5*, *SLC6A4* (*5-HTTLPR*), *MAOA*, *BDNF*, *COMT*, *TPH2* genes and has been evaluated for pathogenic variations.

RESULTS

NO PATHOGENIC OR LIKELY PATHOGENIC VARIANTS CAUSATIVE OF THE REPORTED PHENOTYPE WERE DETECTED

VARIANT INTERPRETATION AND CLINICAL CORRELATION

No significant variant(s) for the given clinical indications that warrants to be reported was detected. There are no clinically relevant variants in coding region and exon-intron boundaries of in *CRHR1*, *CRHR2*, *FKBP5*, *SLC6A4* (*5-HTTLPR*), *MAOA*, *BDNF*, *COMT*, *TPH2* genes and the genes are 100% covered.

ADDITIONAL INFORMATION

- A heterozygous nonsense variant in the *HTRA1* gene (c.1120G>T, p.Gly374Ter) has been detected in this assay. Kindly correlate clinically.
- A heterozygous variant (p.Ala49Val; c.146C>T) in the *NR3C1* gene was also detected in this assay. However, it has high MAF.
- No significant SNV(s)/INDEL(s) or CNV(s) that warrants to be reported were detected. All the genes covered in this assay have been screened for the given clinical indications. To view the coverage of all genes [Click here](#). NGS test methodology details of this assay are given in the appendix.
- With regard to ACMG recommendations for reporting of incidental findings in clinical exome and genome sequencing (PMID: [35802134](#); ACMG SF v3.1), we report significant pathogenic and/ or likely pathogenic variants in the recommended genes for the recommended phenotypes, only if informed consent is given by the patient.
- Please write an email to genetic.counseling@medgenome.com in case you need assistance for genetic counselling. For any further technical queries please write an email to techsupport@medgenome.com

RECOMMENDATIONS

- Genetic counselling is advised.

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Name/Sample ID: Girija Anil Kumar/9415294



Neurogenetic Psychometrics of Stress: A Multidimensional Framework for Intelligence, Personality, and Adaptability

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- The sensitivity of NGS assay to detect copy number variants (CNV) is 70-75%. We recommend discussing alternative testing methodology options with MedGenome Tech Support (techsupport@medgenome.com) as required. In case clinician is suspecting CNV as an important genetic etiology, alternate tests like microarray/MLPA or qPCR may be considered after discussing with the MedGenome TechSupport team.

Sandhya *R. Rajeshkar* *Sheeba*

Sandhya Neir, Ph.D
Sr. Manager - Variant Interpretation

Rajeshkar, Ph.D
Director - Clinical Bioinformatics

Dr. Sheeba Ferooqi, MBBS, DNB (Ob Gyn), DM (Medical Genetics)
Consultant - Clinical Geneticist

APPENDIX

TEST METHODOLOGY

Targeted gene sequencing: Selective capture and sequencing of the protein coding regions and clinically relevant in the genome is performed. Variants identified in the exonic regions and splice-site are generally actionable compared to variants that occur in non-coding regions. Targeted sequencing represents a cost-effective approach to detect variants present in multiple/large genes in an individual.

DNA extracted from blood was used to perform targeted gene capture using a custom capture kit. The libraries were sequenced to mean depth of >80-100X on illumina sequencing platform. We follow the GATK best practices framework for identification of germline variants in the sample using Sentieon [Sentieon]. The sequences obtained are aligned to human reference genome (GRCh38) using BWA aligner [Sentieon, PMID:20080505] and analyzed using Sentieon for removing duplicates, recalibration and re-alignment of indels [Sentieon]. Sentieon haplotype caller is then used to identify variants in the sample. The germline variants identified in the sample is deeply annotated using VarMat pipeline. Gene annotation of the variants is performed using VEP program [PMID: 20562413] against the Ensembl release 104 human gene model [PMID: 34791404]. In addition to SNVs and small indels, copy number variants (CNVs) are detected from targeted sequence data using the ExomeDepth method [PMID: 22942019]. This algorithm detects CNVs based on comparison of the read-depths in the sample of interest with the matched aggregate reference dataset.

Clinically relevant mutations in both coding and non-coding regions are annotated using published variants in literature and a set of diseases databases : ClinVar, OMIM, HGMD, LOVD, DECIPHER (population CNV) and SwissVar [PMID: 26582918, 18842627, 28349240, 21520333, 19344873, 20106818]. Common variants are filtered based on allele frequency in 1000Genome Phase 3, gnomAD (v3.1 & 2.1.1), dbSNP [GCF_000001405.38], 1000 Japanese Genome, TOPMed (Freeze 8), Genome Asia, and our internal Indian population database (MedVarDb v4.0) [PMID: 26432245, 32461613, 11125122, 26292667, 33568819, 31802016]. Non-synonymous variants effect is calculated using multiple algorithms such as PolyPhen-2, SIFT, MutationTaster2 and LRT. Clinically significant variants are used for interpretation and reporting.

Average sequencing depth (x)	Average on-target sequencing depth (x)	Percentage target base pairs covered		
		0x	≥5x	≥20x
277	111.21	0.3	99.65	99.37

Total data generated (Gb) 10.38

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Name/Sample ID: Girija Anil Kumar/9415294



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Page 2 of 5
Name/Sample ID: Prof Dr. Asha Sundaram/9415283



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295	122.91	0.3	99.66	99.45
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Total data generated (Gb)	11.05
Total reads aligned (%)	99.99
Reads that passed alignment (%)	87.18
Data ≥ Q30 (%)	98.50

The classification of the variants is done based on American College of Medical Genetics as described below [PMID:25741868] and strength based evidence(s). Details will be given upon request.

Variant	A change in a gene. This could be disease causing (pathogenic) or not disease causing (benign).
Pathogenic	A disease-causing variant in a gene which can explain the patient's symptoms has been detected. This usually means that a suspected disorder for which testing had been requested has been confirmed.
Likely Pathogenic	A variant which is very likely to contribute to the development of disease however, the scientific evidence is currently insufficient to prove this conclusively. Additional evidence is expected to confirm this assertion of pathogenicity.
Variant of Uncertain Significance	A variant has been detected, but it is difficult to classify it as either pathogenic (disease causing) or benign (non-disease causing) based on current available scientific evidence. Further testing of the patient or family members as recommended by your clinician may be needed. It is probable that their significance can be assessed only with time, subject to availability of scientific evidence.

The transcript used for clinical reporting generally represents the canonical transcript (MANE Select), which is usually the longest coding transcript with strong/multiple supporting evidence. However, clinically relevant variants annotated in alternate complete coding transcripts could also be reported.

Variants annotated on incomplete and nonsense mediated decay transcripts will not be reported.

The in-silico predictions are based on Variant Effect Predictor (v109), [SIFT version - 5.2.2; PolyPhen - 2.2.2; LRT version (November, 2009); CADD (v1.6); Splice AI; dbNSFPv4.2] and MutationTaster2 predictions are based on NCBI/Ensembl 66 build (GRCh38 genomic coordinates are converted to hg19 using UCSC LiftOver and mapped to MT2).

Diseases databases used for annotation includes ClinVar (updated on 20250227), OMIM (updated on 20052025), HGMD (v2024.4), LOVD (Nov-18), DECIPHER (population CNV) and SwissVar.

LIMITATIONS

- Genetic testing is an important part of the diagnostic process. However, genetic tests may not always give a definitive answer. In some cases, testing may not identify a genetic variant even though one exists. This may be due to limitations in current medical knowledge or testing technology. Accurate interpretation of test results may require knowing the true biological relationships in a family. Failing to accurately state the biological relationships in (my/my child's) family may result in incorrect interpretation of results, incorrect diagnoses, and/or inconclusive test results.
- Test results are interpreted in the context of clinical findings, family history and other laboratory data. Only variants in genes potentially related to the proband's medical condition are reported. Rare polymorphisms may lead to false

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Name/Sample ID: Prof Dr. Asha Sundaram/9415283



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The in-silico predictions are based on Variant Effect Predictor (v109), [SIFT version - 5.2.2; PolyPhen - 2.2.2; LRT version (November, 2009); CADD (v1.6); Splice AI; dbNSFPv4.2] and MutationTaster2 predictions are based on NCBI/Ensembl 66 build (GRCh38 genomic coordinates are converted to hg19 using UCSC LiftOver and mapped to MT2).

Diseases databases used for annotation includes ClinVar (updated on 20250227), OMIM (updated on 20052025), HGMD (v2024.4), LOVD (Nov-18), DECIPHER (population CNV) and SwissVar.

LIMITATIONS

- Genetic testing is an important part of the diagnostic process. However, genetic tests may not always give a definitive answer. In some cases, testing may not identify a genetic variant even though one exists. This may be due to limitations in current medical knowledge or testing technology. Accurate interpretation of test results may require knowing the true biological relationships in a family. Failing to accurately state the biological relationships in (my/my child's) family may result in incorrect interpretation of results, incorrect diagnoses, and/or inconclusive test results.
- Test results are interpreted in the context of clinical findings, family history and other laboratory data. Only variants in genes potentially related to the proband's medical condition are reported. Rare polymorphisms may lead to false negative or positive results. Misinterpretation of results may occur if the information provided is inaccurate or incomplete.
- Specific events like copy number variants, translocations, repeat expansions and chromosomal rearrangements may not be reliably detected with targeted sequencing. Variants in untranslated region, promoters and intronic variants are not assessed using this method.
- Genetic testing is highly accurate. Rarely, inaccurate results may occur for various reasons. These reasons include, but are not limited to: mislabeled samples, inaccurate reporting of clinical/medical information, rare technical errors

Page 3 of 5
Name/Sample ID: Girija Anil Kumar/9415294



Neurogenetic Psychometrics of Stress: A Multidimensional Framework for Intelligence, Personality, and Adaptability

MedGenome Labs Ltd.

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295	122.91	0.3	99.66	99.45
Total data generated (Gb)		11.05		
Total reads aligned (%)		99.99		
Reads that passed alignment (%)		87.18		
Data ≥ Q30 (%)		98.50		

The classification of the variants is done based on American College of Medical Genetics as described below [PMID-25741868] and strength based evidence(s). Details will be given upon request.

Variant	A change in a gene. This could be disease causing (pathogenic) or not disease causing (benign).
Pathogenic	A disease causing variant in a gene which can explain the patient's symptoms has been detected. This usually means that a suspected disorder for which testing had been requested has been confirmed.
Likely Pathogenic	A variant which is very likely to contribute to the development of disease however, the scientific evidence is currently insufficient to prove this conclusively. Additional evidence is expected to confirm this assertion of pathogenicity.
Variant of Uncertain Significance	A variant has been detected, but it is difficult to classify it as either pathogenic (disease causing) or benign (non-disease causing) based on current available scientific evidence. Further testing of the patient or family members as recommended by your clinician may be needed. It is probable that their significance can be assessed only with time, subject to availability of scientific evidence.

The transcript used for clinical reporting generally represents the canonical transcript (MANE Select), which is usually the longest coding transcript with strong/multiple supporting evidence. However, clinically relevant variants annotated in alternate complete coding transcripts could also be reported.

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Diseases databases used for annotation includes ClinVar (updated on 20250227), OMIM (updated on 20052025), HGMD (v2024.4), LOVD (Nov-18), DECIPHER (population CNV) and SwissVar.

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Page 3 of 5

Name/Sample ID: Prof Dr. Asha Sundaram/9415283



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- The sensitivity of NGS assay to detect copy number variants (CNV) is 70-75%. We recommend discussing alternative testing methodology options with MedGenome Tech Support (techsupport@medgenome.com) as required. In case clinician is suspecting CNV as an important genetic etiology, alternate tests like microarray/ MLPA or qPCR may be considered after discussing with the MedGenome TechSupport team.

Sandhya Nair, Ph.D Sr. Manager - Variant Interpretation	Balaji Rajeshekar, Ph.D Director - Clinical Bioinformatics	Dr. Sheeba Farooqui, MBS, DNB (Ob Gyn), DM (Medical Genetics) Consultant - Clinical Geneticist

APPENDIX

TEST METHODOLOGY

Targeted gene sequencing: Selective capture and sequencing of the protein coding regions and clinically relevant in the genome is performed. Variants identified in the exonic regions and splice-site are generally actionable compared to variants that occur in non-coding regions. Targeted sequencing represents a cost-effective approach to detect variants present in multiple/large genes in an individual.

DNA extracted from blood was used to perform targeted gene capture using a custom capture kit. The libraries were sequenced to mean depth of ~80-100x on Illumina sequencing platform. We follow the GATK best practices framework for identification of germline variants in the sample using Sentieon (Sentieon). The sequences obtained are aligned to human reference genome (GRCh38) using BWA aligner [Sentieon, PMID:20080505] and analyzed using Sentieon for removing duplicates, recalibration and re-alignment of indels [Sentieon]. Sentieon haplotype caller is then used to identify variants in the sample. The germline variants identified in the sample is deeply annotated using VarMOT pipeline. Gene annotation of the variants is performed using VEP program [PMID: 20552413] against the Ensembl release 104 human gene model [PMID: 34791404]. In addition to SNVs and small indels, copy number variants (CNVs) are detected from targeted sequence data using the ExomeDepth method [PMID: 22942019]. This algorithm detects CNVs based on comparison of the read-depths in the sample of interest with the matched aggregate reference dataset.

Clinically relevant mutations in both coding and non-coding regions are annotated using published variants in literature and a set of diseases databases - ClinVar, OMIM, HGMD, LOVD, DECIPHER (population CNV) and SwissVar [PMID: 26582918, 18842627, 28349240, 21520033, 19344873, 20108181]. Common variants are filtered based on allele frequency in 1000Genome Phase 3, gnomAD (v3.1 & 2.1.1), dbSNP [GCF_000001405.38], 1000 Japanese Genome, TOPMed (Freeze 8), Genome Asia, and our internal Indian population database (MedVar0b v4.0) [PMID: 26432425, 32461613, 11122122, 2692667, 93568819, 31803016]. Non-synonymous variants effect is calculated using multiple algorithms such as PolyPhen-2, SIFT, MutationTaster2 and LRT. Clinically significant variants are used for interpretation and reporting.

Average sequencing depth (x)	Average on-target sequencing depth (x)	Percentage target base pairs covered		
		Dx	≥5x	≥20x
277	111.21	0.3	99.65	99.37

Total data generated (Gb) 10.38

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Name/Sample ID: Girja Anil Kumar/9415294



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DNA TEST REPORT - MEDGENOME LABS

Full Name / Ref No:	PROF DR. ASHA SUNDARAM	Order ID/Sample ID:	1458742/9415283
Gender:	Female	Sample Type:	Blood
Date of Birth / Age:	48 years	Date of Sample Collection:	24 th September 2025
Referring Clinician:	Dr. Asha Sundaram, Saveetha School of Law - Chennai,	Date of Sample Receipt:	25 th September 2025
		Date of Order Booking:	25 th September 2025
		Date of Report:	11 th November 2025
Test Requested:	Whole exome sequencing (80-100x)[Extended TAT]		

CLINICAL DIAGNOSIS / SYMPTOMS / HISTORY

Prof Dr. Asha Sundaram is suspected to harbor mutations in *CHR1, CHR2, NR3C1, FKBP5, SLC6A4, MAOA, BDNF, COMT, TPH2* genes and has been evaluated for pathogenic variations.

RESULTS

NO PATHOGENIC OR LIKELY PATHOGENIC VARIANTS CAUSATIVE OF THE REPORTED PHENOTYPE WERE DETECTED.

VARIANT INTERPRETATION AND CLINICAL CORRELATION

No significant variant(s) for the given clinical indications that warrants to be reported was detected. There are no clinically relevant variants in coding region and exon-intron boundaries of *CHR1, CHR2, NR3C1, FKBP5, SLC6A4, MAOA, BDNF, COMT, TPH2* genes and the genes are 100% covered.

ADDITIONAL INFORMATION

- No significant SNV(s)/INDEL(s) or CNV(s) that warrants to be reported were detected. All the genes covered in this assay have been screened for the given clinical indications. To view the coverage of all genes [Click here](#). NGS test methodology details of this assay are given in the appendix.
- With regard to ACMG recommendations for reporting of incidental findings in clinical exome and genome sequencing (PMID: 23802138; ACMG SF v3.1), we report significant pathogenic and/or likely pathogenic variants in the recommended genes for the recommended phenotypes, only if informed consent is given by the patient.
- Please write an email to genetic.counseling@medgenome.com in case you need assistance for genetic counselling. For any further technical queries please write an email to techsupport@medgenome.com.

RECOMMENDATIONS

- Genetic counselling is advised.

Page 1 of 5

Name/Sample ID: Prof Dr. Asha Sundaram/9415283



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DNA TEST REPORT - MEDGENOME LABS

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Name/Sample ID: Prof Dr. Asha Sundaram/9415283



Neurogenetic Psychometrics of Stress: A Multidimensional Framework for Intelligence, Personality, and Adaptability

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Sandhya

Sandhya Neir, Ph.D
 Sr. Manager -
 Variant Interpretation

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Sheeba

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 Gyn), DM (Medical Genetics)
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Average sequencing depth (x)	Average on-target sequencing depth (x)	Percentage target base pairs covered		
		0x	$\geq 5x$	$\geq 20x$

Page 2 of 5
 Name/Sample ID: Prof Dr. Adha Sundaram/9415283

