

# Understanding Changing Trends to Study Human Behavior through Quantitative and Qualitative Assessment through Dermatoglyphics

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**Abstract**—This study aims to determine the following-Working potential of the 10 lobes of the brain putting them in ranks starting from 1 to 10 using forensic prescribed methods: This will help each individual be able to understand the natural genius zones hence avoiding any “trial & errors” leading to competitive failures resulting in a stressful life. The potential will help us guide each individual to their strengths & understand their natural weaknesses. All solutions: academic/professional/ life compatibility along with challenge acceptance & reaction to certain situations can be assessed by using the science- Dermatoglyphics. Behavioral patterns reflected on the fingerprints as per dermatoglyphic studies: Each fingerprint reveals a character trait. Each finger is a representative of one lobe of the brain. Basically understanding of the fingerprints will help us know the “key” to operating the particular lobe activity. Assessment of naturally induced triggers leading to stresses/ psychotic behaviors & health deterrent tendencies based on dermatoglyphics: Once the working potential of the brain is evaluated it becomes easy to reach the root cause of the triggers- hence a solution can also be provided from the root itself.

One of the findings suggests that people with more whorls are self-starters while people with more loops need handholding. Another finding shows that people having radial fingerprints are critical evaluators in connecting lobe characters.

**Index Terms**—Character traits, dermatoglyphics, fingerprint patterns, ten lobes, qualitative assessment, quantitative assessment.

## I. INTRODUCTION

Dermatoglyphics is the scientific study of the correlation of fingerprint patterns and the brain. The link between the brain and the fingerprint patterns has already been proved [1]. There are 5 horizontal lobes in the brain: the Pre-frontal lobe (inferior frontal lobe), the Frontal lobe (superior frontal lobe), the Parietal lobe, the Temporal lobe and the Occipital lobe and the brain is also split vertically into the Left brain and the Right brain, so each lobe of the brain is split into two parts which makes the brain divided into 10 lobes.

We all know about the diagonal linking between the brain and the body parts i.e. the left brain controls the right side of the body and the right brain controls the left side of the body, in the same way, there is a diagonal linking between the brain and the fingers. So, the lobes of the left brain are connected with the fingers of the right hand and the lobes of the right

brain are connected with the fingers of the left hand and each finger represents a lobe of the brain. (See Tables I and II)

TABLE I: THE LINK BETWEEN FINGERS OF THE LEFT HAND AND THE LOBES OF THE RIGHT BRAIN

Finger of the Left Hand	Corresponding Lobe (Right brain)	Function
Thumb	Pre-frontal (Action)	Interpersonal Skills
Index	Frontal (Thoughts)	3D Imagination/Spatial
Middle	Parietal (Tactiles)	Gross Motor Skills
Ring	Temporal (Auditory)	Musical Skills & Emotions
Little	Occipital (Visuals)	2D

TABLE II: THE LINK BETWEEN FINGERS OF THE RIGHT HAND AND THE LOBES OF THE LEFT BRAIN

Finger of the Right Hand	Corresponding Lobe (Left brain)	Function
Thumb	Pre-frontal (Action)	Intrapersonal Skills
Index	Frontal (Thoughts)	Logical Reasoning
Middle	Parietal (Tactiles)	Fine Motor Skills
Ring	Temporal (Auditory)	Linguistics
Little	Occipital (Visuals)	Minute Observation & Senses

## II. REVIEW OF LITERATURE

Michael Kucken & Alan C. Newell (2005) talked about the formation of epidermal ridges (fingerprints, toe-prints and palm-prints) in their article named ‘Fingerprint formation’. They found that primary ridges are the results of the buckling instability that acts on the basal layer of the epidermis where the buckling instability is formed due to stresses formed in the basal layer. They also found that fingerprint patterns are impacted by the geometry of the volar pads and the nervous system is also involved in the whole process. Cell multiplications increase the intensity of the primary ridges formed. [2]

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Mandeep Singh & Oindri Majumdar (2015) in their paper titled 'Dermatoglyphics: Blueprint of Human Cognition on Fingerprints' talk about the connection of the brain with the fingerprints. They have first mentioned about the five lobes of the brain that have been defined by neuroscience- the pre-frontal lobe, frontal lobe, parietal lobe, temporal lobe and the occipital lobe with their functions. Then they have talked about the split-brain theory given by Dr. Roger Sperry [3] i.e. the human brain is split vertically into two parts, the left brain and the right brain and that there is a diagonal linking between the two parts of the brain and the body, so, the left brain controls the right side of the body and the right brain controls the left side of the body. They have also mentioned about the theory of NGF-EGF (Neural Growth Factor- Epidermal Growth Factor) given by Nobel Prize winners of the year of 1986 in Physiology or Medicine, Dr. Rita Levi Montalcini and Dr. Stanley Cohen. [4]-[6] They found that there was a connection between the development of the nerves and the epidermis. This theory has been enormously substantiated by the work of a Canadian neurobiologist, Wilder Penfield who established the working relationship between fingerprints and various regions of the human brain. They have also talked about the neural tube defect, often referred to as Anencephaly where due to failure of complete development of the cephalic end of the neural tube, a child is born with major parts of the brain missing and no forebrain. It has been seen that such children do not have fingerprints. [7]

Mostaf Najafi (2009) in his study titled 'Association between Finger Patterns of Digit II and Intelligence Quotient Level in Adolescents' conducted a study on 342 adolescents who belonged to the Shahrekord of Iran. Out of the 342 adolescents, 144 were talented individuals, 102 were normal individuals and the other 96 individuals were children who had learning disabilities. IQ levels of all the 342 participants was measured and then compared to their fingerprint patterns on the second fingers (index fingers) of the right hand and the left hand. The hypothesis of the study was that there is no connection of fingerprint patterns and an individual's IQ but results showed that there was a correlation between the second right finger and the IQ levels of the individual. Individuals with learning disabilities had more number of Ulnar loops while talented individuals had more amount of Radial loops. Normal individuals had the most number of whorls as compared to the other two groups. [8]

Dr. Viktor Minkin (2007) in his article titled 'Fingerprints and the Thermodynamics of Human Development' mentioned the three main clusters or types of fingerprint patterns- whorls, loops and archs and also about the association of fingerprint patterns and the individual's personality or genetic diseases such as Down syndrome- the study of which is called Dermatoglyphics. In 2007, he gave a hypothesis that the thermodynamics of human development can explain "a direct link between fingerprints, which reflect the character and health of the person, and DNA". He also mentioned about the importance of minutiae- each line of the fingerprint. [9]

T P Jmeela (2010) in her research paper titled 'Dermatoglyphic Patterns Evident in Disability Groups' has studied dermatoglyphic patterns of patients from different disability groups that include- Autism, cerebral palsy, deaf & dumb, Down syndrome and learning disabilities and

compared them to a control group which included people without any disabilities. She found that autistic children had more number of archs, they had higher number of palmar flexion ridges, ridge splitting/separation. She found that when compared to the control group, people with cerebral palsy had more number of ulnar loops on the first finger (the thumb), they had a low pattern concentration and they also had ridge splitting/separation. Deaf and dumb males had a high number of whorls and had dissymmetry in corresponding fingers. Individuals with Down syndrome had more number of ulnar loops and there was a variation in the patterns of the ulnar loops. [10].

### III. QUANTITATIVE ASSESSMENT

Forensic departments have been using fingerprints as a source of identification since a very long time. There are three major types or clusters of fingerprint patterns. They are

- Whorls
- Loops
- Archs

Each of these types has different sub-types. Sir Francis Galton was the first person to introduce the use of fingerprints to identify criminals to the American Investigation Bureau (AIB) [11]. Fingerprints were used to identify criminals. It was found that the criminals from Asia, Africa, America, the United Kingdom and/or other places had a marked similarity in their fingerprint patterns and they displayed similar behavior too (causing harm to others, etc.). He classified fingerprints into 8 sub-types. The quantitative application of fingerprints is being done by the forensic departments worldwide, by the FBI, Scotland Yard & in India by RAW [Research & analysis Wing] to just name a few.

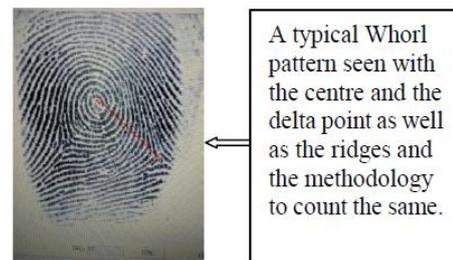


Fig. 1. Courtesy- Academy of Multiple Intelligence (Brainbow), India.

Each line on the finger (ridge) represents a group of neurons present in the corresponding lobe of the brain. So the number of ridges on each finger shows us the density of the neurons present in that corresponding lobe of the brain. This in-turn reflects the storage capacity (memory). The number of ridges from the center of the fingerprint pattern till the 'delta point' (a triangle formed by the fingerprints) on a finger gives us the Ridge Count (RC) and the total number of ridges on all the fingers gives us the Total Finger Ridge Count (TFRC) (see figure 1.1 & figure 1.3). If the TFRC is less than 60 or even between 60 and 99 then these individuals need a stable and familiar learning environment. If the TFRC is between 100 and 149 then the individual's performance depends on adequate external stimuli, inputs, motivation and adequate guidance. If the TFRC is between 150 and 199 then such

individuals get distracted very easily. To arouse their interest, it is better to teach them with multiple approaches. They are much more suitable for multi-disciplinary studies. If the TFRC is 200 or above, the individual should lead their full life in order to exploit their potential. They are usually good at multi-tasking with a very high short-term memory.

#### IV. QUALITATIVE ASSESSMENT

Types of fingerprints- The forensics are using just 8 types of fingerprints that were classified by Sir Francis Galton. Today a lot more sub-types of fingerprints have been classified and their characteristics have been defined. We will take a case study of 37 sub-types.

The 8 types classified by Sir Francis Galton were plain arch, tented arch, simple loop (ulnar loop), central pocket loop, double loop, lateral pocket loop (radial loop), plain whorl and accidental ( see figure 1.2) [12].

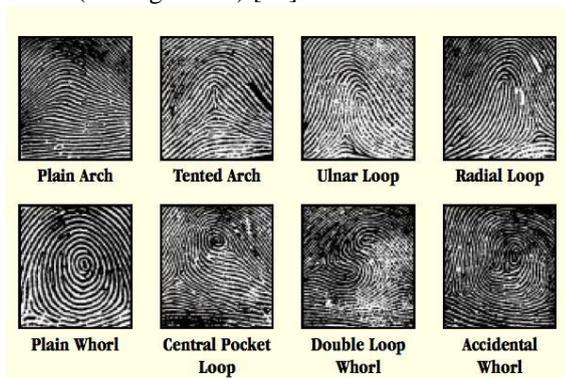


Fig. 2. The 8 types of fingerprint patterns introduced by Sir Francis Galton

The 37 sub-types [13] which have been taken for this case study, along with their character traits are as follows:

**1. Target Whorl (Wt)** - Individualistic & self-centered; goal oriented and focused; loves competition and winning; strong determination and will power; loves to initiate and synergize; good clarity, strong ability to understand & comprehend; able to see things from all perspectives; high on reasoning, asks a lot of questions and takes action after proper reasoning.

**2. Lateral Target Whorl (Wtl)** - Similar to the target whorl, along with after-thought on creativity.

**3. Radial Target Whorl (Wtr)** - Similar to the target whorl, with creativity as well as delayed critical evaluation.

**4. Spiral Whorl (Ws)** - Similar to the target whorl; slightly weak on will power; high on emotions and stubbornness; enthusiastic and diligent learner after prior reasoning; need to be reminded the tasks once for them to finish; high on curiosity; tend to be mischievous at a younger age.

**5. Lateral Spiral Whorl (Wsl)** - Similar to spiral whorl, along with creativity.

**6. Radial Spiral Whorl (Wsr)**- Similar to the spiral whorl, with creativity as well as critical evaluation.

**7. Composite Whorl (Wc)**- Like to have multiple goals and have variety in planning; easily influenced, gets swayed away easily; indecision leads to confusion and frustration; becomes judgmental without much thought; focuses on big pictures and tends to miss details; unable to articulate and

express thoughts clearly because of thinking from different angles; highly authoritative and high on self-management; weak on will-power and determination; difficulty in focusing on the task at hand due to wavering mindset; likes to have freedom to make own choices; easy to mingle and switch between topics in a conversation.

**8. Lateral Composite Whorl (Wcl)**-Similar to the composite whorl, along with creativity.

**9. Radial Composite Whorl (Wcr)**- Similar to the composite whorl, with creativity as well as critical evaluation.

**10. Double Loop Whorl (Wd)**- Confusion and difficulty in decision-making; once agreed and accepted, the ability to imitate is stronger than others who learn by imitation; ability to pick up things and learn fast upon seeing; almost double power of imitation and thinking than others; tends to look at positive side and overlook the negative sides; does not like to criticize or judge others; has most of the characteristics of that of the Ulnar Loop.

**11. Lateral Double Loop Whorl (Wdl)**-Similar to the double loop whorl, along with creativity.

**12. Radial Double Loop Whorl (Wdr)**- Similar to the double loop whorl, with creativity as well as critical evaluation.

**13. Elongated Whorl (We)**- Good with numbers and computations; tends to be a perfectionist with numbers; good in management, analysis of synergies, integrated thinking, infer and make judgments; ability to generate huge missions; ability to handle & complete goals by following the plan; tends to get confused between emotions and logic; gets easily influenced by past experiences and emotions hence will keep and revisit the past load of information; tends to keep thinking and get worried.

**14. Lateral Elongated Whorl (Wel)**- Similar to the elongated whorl, along with creativity.

**15. Radial Elongated Whorl (Wer)**- Similar to the elongated whorl, with creativity as well as critical evaluation.

**16. Imploding Whorl (Wi)**- Good in taking initiative to plan & manage goal which was set; has low concentration level and lacks focus; weaker abilities in integrating the things towards the goal; tends to have heart at two different places/goals/things at the same time; lacks in energy & persistence to complete the task to finish; needs lot of repetition and practice to learn a task; low confidence levels due to "forgetfulness"; low on adaptation to a particular environment.

**17. Lateral Imploding Whorl (Wil)**- Similar to the imploding whorl, along with creativity.

**18. Radial Imploding Whorl (Wir)**- Similar to the imploding whorl, with creativity as well as critical evaluation.

**19. Lateral Pocket Whorl (Wl)**-Very creative in ideas, tends to be different from the league; tends to follow perfection; weaker abilities in integrating the things towards the goal; low on taking action and achieve, follow through the idea; loves to fantasize and dream of perfection/creativity.

**20. Peacock Eye Whorl (Wlp)** - Creative thinking & tends to achieve perfection; high degree of comprehension and understanding; good abilities to differentiate; good leadership skills; tends to work in a manner very different from the league; optimistic; creative in self-expression, very

lively and spontaneous; good in arts and designs; loves to help weak people, to overcome difficult situations.

**21. Radial Peacock Eye Whorl (Wrp)** – Very high on critical thinking and evaluation; learns by reverse thinking and is often seen as eccentric; likes to ask a lot of questions and then evaluates each answer critically; have high acuity, hence quick on decision-making; self-centered and like to work in their own ways; very good in fault finding and fault fixing.

**22. Ulnar Loop (U)**– Strong on imitation based learning; flexible and adaptable in any given situation; very conventional, not very creative; not very focused and goal oriented; not very ambitious by nature; dislikes and tends to avoid conflicts; likes being with people, but will not initiate conversation; easily influenced by environment, will learn both good and bad, necessary to be guided between right and wrong; likes to work in a set pattern, not comfortable with frequent changes.

**23. Radial Loop (R)**– High on innovation, creativity and originality, “out of the box”; strong ability to comprehend and understand; likes to be different from the league; often viewed as rebellious; tend to use reverse argument and reasoning; ego-centric, will use own methods to complete given tasks; likes deductive & critical reasoning; imitates highly before debating, defending and opposing; high on critical evaluation.

**24. Falling Loop (Lf)**– Very high on comprehension and understanding; not very stable as compared to others; health is unstable; usually very cautious about health.

**25. Radial Falling Loop (Lfr)**– Similar to the falling loop, with creativity as well as critical evaluation.

**26. Ulnar Peacock Eye Loop (Llp)**– Inherits all characteristics of the Ulnar Loop; is flexible and creative but likes to be in conventional patterns; will seek perfection in the task at hand.

**27. Radial Peacock Eye Loop (Lrp)**– Inherits all characteristics of the Radial Loop; is flexible, creative and unconventionally creative; “out of the box” thinking; will seek perfection in the task but different from the league; good in fault finding and fault fixing.

**28. Accidental Loop (Lx)**– Very erratic; acts circumstantially; complete duplication of the mentor.

**29. Simple Arch (As)**– Has infinity elasticity for learning, absorbs like a sponge; learning potential exists life-long, without any limitation; hardworking and efficient, but needs to be patient; suppresses lot of emotions and feelings; very cautious of safety and security, hence doubtful by nature; highly judgmental, bipolar- swing on two extremes; more reserved in unfamiliar environment; emotionally inconsistent and it affects learning; lacks on self-confidence, need to be affirmed and encouraged.

**30. Tented Arch (At)**– Very sharp in learning with infinite potential; absorbs like a sponge; tends to think a lot and is bipolar impulsive; interested in diverse subjects and topics; high on enthusiasm and optimism however discouraged if no results are seen within short period of time; very individualistic in managing and planning finances for self; interested in modern art and other such creative endeavors.

**31. Ulnar Arch (Au)**– Very high and infinite potential in

learning by imitation; seeks wisdom; good with abstract thinking; ability to innovate especially in technical subjects; tends to learn more with age.

**32. Radial Arch (Ar)**– Has all characteristics of Ulnar Arch with reverse thinking; responsive to emotions; however shuts off with vagueness and ambiguity; likes to venture into abstracts; gets irritated with too much of details; inconsistent in thoughts and nervous activity.

**33. Peacock Eye Arch (Alp)**– Similar to the Ulnar Arch, along with creativity.

**34. Radial Peacock Eye Arch (Arp)**– Similar to the Radial Arch, with creativity as well as critical evaluation.

**35. Falling Loop Arch (Alf)**– Infinite potential- based on mentors; health concerns always at the back of the mind.

**36. Radial Falling Loop (Arf)**– Infinite potential- based on mentors; critical evaluation of health concerns.

**37. Accidental Whorl (Wx)**– Highly unstable and wavering mind; cannot focus on one goal or task at hand; has multiple and diverse characteristics; has many strange and unique ideas; unable to integrate ideas and work; highly dispersed energies in multiple directions; potential genius if mentored properly step-by-step; mentoring has to be highly patient with this person.



Fig. 3. Courtesy- Academy of Multiple Intelligence (Brainbow), India.

These characteristics are interpretations and have been confirmed by more than 5000 individuals. If the fingerprints of an individual can be identified correctly according to these 37 types and the characteristics of those fingerprints be understood according to the corresponding lobe or the function of the lobe along with the RC/TFRC then the “blueprint” of the individual’s brain can be decoded hence making it very easy to predict behavior of the individual and find out the strong and the weak zones of the individual.

## V. METHOD

The study is completely based on secondary data. The researcher has collected all data from a company established in Ahmedabad, Gujarat, India called Academy of Multiple Intelligence- who are into dermatoglyphic & multiple intelligence tests (D&MIT) since 2011 and have completed tests for more than 12,000 individuals. The researcher studied data of more than 5000 individuals through their feedback and testimonials and also one-to-one interaction with the individuals who were available. The researcher studied characteristics assigned to fingerprint patterns and confirmed those characteristics with the individuals.

## VI. RESULTS

It was found that the characteristics assigned to the 37 types of fingerprint patterns were in sync with the behavior of the individuals. The individuals have even themselves confirmed with the researcher that the character traits assigned to them by studying their fingerprints are absolutely correct.

## VII. CONCLUSION

With the help of this tool (dermatoglyphics) we can unearth the natural innate skills with which an individual is born and can provide correct nurturing and create a genius. If we talk of Sigmund Freud's ice-berg, where the part that is above the water represents our consciousness and is less than 10% of the total ice-berg and the parts that are under the water, the sub-conscious and the unconscious which are not easily accessible but make up 90% of the ice-berg, this tool can help us reach that 90% and make us aware of our sub-conscious and unconscious mind.

This can be useful for **children and students** in the following ways:

- Identify & Nurture innate skills, talents and improvement areas.
- Channelize the learning styles and methods.
- Optimize learning through sequence: Visual-Auditory-Kinesthetic [VAK study model]
- Improve parent – children relationships.
- Select the appropriate board for education, educational stream and subjects of specialization.
- Understand natural strengths & how to develop further.
- Understand natural shortcomings and how to improve.
- Chalk out the roadmap to graduation, post-graduation and occupation.
- Understand personal character traits and boost confidence.

**Compatibility / Relationship matching** for Business & Life Partnerships

- Understanding behavioral patterns of each other.
- Develop harmony in the relationships.
- Supplementing each other's shortcomings and enhancing combined strengths.
- Improve interpersonal communication and strengthen mutual bondage.

### Triggers leading to Stress/Psychotic behavior:

Using dermatoglyphics, we can decode the brain of an individual hence knowing what triggers/stressors can lead to abnormal/psychotic behaviors. We can even identify children with tendencies of dyslexia, dyscalculia, dysgraphia, people with ADHD/ADD, hallucinations, bipolar tendencies, etc. Once the root cause is known then qualified people such as psychologists/psychiatrists can prescribe the correct remedies/medicines for such people.

A few examples for this are, if there is an individual with a 'reverse' or radial type of fingerprint, the person evaluates each thing/situation very critically and when such a person experiences a traumatic situation, similar situations will induce a fear in the individual which further leads to self-induced trauma, depression and other such abnormal

behaviors. Another example is, when an individual has any Arch type of fingerprint; the person needs a lot of handholding. If the person is left on his/her own then the person starts living with a "fear of the unknown" which can lead to psychotic behaviors. People with many archs are often termed by normal people like us as "bipolar" because of their erratic behavior and mood-swings.

As psychologists, we need to understand the importance and the benefits that we can gain from this science. We need to accept and adapt to it in order to know the root cause of an individual's behavior and to decode the individual's brain, to know the potential, the strengths, the weaknesses and many other traits that the person has.

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