

Dermatoglyphics – a Non - Invasive Diagnostic Tool in Predicting the Brain Configuration Through Mental Intelligence in First Year Medical Students

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ABSTRACT

Introduction: dermatoglyphics is a Greek word in which Derma means skin and glyph means carving. It represents the epidermal ridges of fingers, toes, palm and sole which are formed in early embryonic life during the 10th to 16th week of Intrauterine life and remains permanent. As these configurations are unique for everyone, in this study we aim to prove that each individual is born with inborn talent and multiple intelligence, if one is able to identify it, he / she can build upon it and shall excel in their life. The present study aimed at evaluating dermatoglyphics as a diagnostic tool in predicting the multiple intelligence in first year medical students. Dermatoglyphic study of 206 students were done using ink rolling technique and the data were analysed for fingertip patterns like arch, whorl and loop pattern in the ridges. Their inborn talent, multiple intelligence, preferred learning style, personality trait and behaviour, strengths and weakness and the ways to achieve their desired triumphs were evaluated using a standard questionnaire form. Both sets of data were correlated and analysed. This analysis discloses their inborn qualities and talent which will help them to excel in their particular skill. Hence if we can identify multiple intelligence using dermatoglyphics, it can be used as a valuable tool to choose the right career path if one's inborn talent is identified in the correct time.

Keywords: Dermatoglyphics; Dermatoglyphics mental intelligence test; Inborn talent; Fingerprint.

Introduction

Dermatoglyphics is the study of configurations of epidermal ridges on hands and foot. It is formed as early as 10th week and completed within 24th week of intrauterine life and stays permanent unless the dermis of the skin is damaged. These configurations are unique for each individual as they are genetically determined and is different for both the hands in same person. In case of any genetic disorders these configurations deviate from normal and therefore used as a diagnostic tool in several diseases for example in autosomal aneuploidy, allosomal aberrations, Wilson's disease, Huntington's chorea, congenital heart disease, psoriasis, cerebral palsy & rubella¹.

It has been scientifically proven that the Neocortex, which is brain's intelligence centre grows in synchronisation with the fingerprint ridges. The structure of the Neocortex determines an individual's ability to perceive, learn and react to an input. If the link between fingerprint ridges and cerebral cortex is established, intelligence of a person is bound to reflect from fingerprint patterns².

Dermatoglyphics Multiple Intelligence Test (D.M.I.T) is a scientific test based on the study of fingerprints and brain lobes. It helps in understanding the unique inborn potential and personality of a person. It gives

complete picture of a person's strength and weakness which guides them to take the successful path. Theory of Multiple Intelligence was proposed by Prof. Howard Gardner in 1983^{3,4} who has defined various kinds of mental intelligence like linguistic, musical, logical (mathematical), visual/spatial, bodily/kinaesthetic, intrapersonal, interpersonal, and naturalistic, of which a child may stand out. Therefore, by studying the fingerprints of a person, the forms and manifestation of various types of intelligences can be determined by DMIT⁵. Medical Professionals call it Medical Palmistry. In this study we aimed to prove that every individual is born with inborn talent and multiple intelligence, if one is able to identify it, he/she can build upon it and shall excel in their life.

Aim & Objective

The present study aimed at evaluating dermatoglyphics as a diagnostic tool in predicting the multiple intelligence in first-year medical students.

Materials and Methods

206 first year medical students with age group of 17-18 years and irrespective of their sex, were selected for this study. Their Dermatoglyphics pattern were

studied using ink rolling technique. The impressions were recorded on the recording sheets. The materials used were pages, stamp ink, a scanner, and a computer. Evaluation of the mental intelligence of these 206 students were done by standard Questionnaire form (Multiple Intelligences Survey form © 1999 Walter McKenzie, The One and Only Surf aquarium). Their personality types and intelligence profile were studied and classified into 9 types of learners – linguistic, logical/mathematical, musical, bodily kinaesthetic, spatial, naturalist, interpersonal, intrapersonal, existential.

Ethical Clearance

The Institutional Ethics Committee, in its meeting held on February 15, 2020, has approved the following research work proposed to be carried out at Shri Sathya Sai Medical College and research institute, Chennai, India. This study has been carried out in accordance with the ethical guidelines prescribed by Central Ethics Committee on Human Research (CECHR).

Multiple Intelligences Survey

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Complete each section by placing a “1” next to each statement you feel accurately describes you. If you do not identify with a statement, leave the space provided blank. Then total the column in each section.

Section 1

- I enjoy categorizing things by common traits.
- Ecological issues are important to me.
- Hiking and camping are enjoyable activities.
- I enjoy working on a garden.
- I believe preserving our National Parks is important.
- Putting things in hierarchies makes sense to me.
- Animals are important in my life.
- My home has a recycling system in place.
- I enjoy studying biology, botany and/or zoology.
- I spend a great deal of time outdoors.
- Total for Section 1

Section 2

- I easily pick up on patterns.
- I focus in on noise and sounds.
- Moving to a beat is easy for me.
- I've always been interested in playing an instrument.
- The cadence of poetry intrigues me.
- I remember things by putting them in a rhyme.
- Concentration is difficult while listening to a radio or television.
- I enjoy many kinds of music.
- Musicals are more interesting than dramatic plays.
- Remembering song lyrics is easy for me.
- Total for Section 2

Section 3

- I keep my things neat and orderly.
- Step-by-step directions are a big help.

- Solving problems comes easily to me.
- I get easily frustrated with disorganized people.
- I can complete calculations quickly in my head.
- Puzzles requiring reasoning are fun.
- I can't begin an assignment until all my questions are answered.
- Structure helps me be successful.
- I find working on a computer spreadsheet or database rewarding.
- Things have to make sense to me, or I am dissatisfied
- Total for Section 3

Section 4

- It is important to see my role in the “big picture” of things.
- I enjoy discussing questions about life.
- Religion is important to me.
- I enjoy viewing art masterpieces.
- Relaxation and meditation exercises are rewarding.
- I like visiting breathtaking sites in nature.
- I enjoy reading ancient and modern philosophers.
- Learning new things is easier when I understand their value.
- I wonder if there are other forms of intelligent life in the universe.
- Studying history and ancient culture helps give me perspective.
- Total for Section 4

Section 5

- I learn best interacting with others.
- The more the merrier
- Study groups are very productive for me.
- I enjoy chat rooms.
- Participating in politics is important.
- Television and radio talk shows are enjoyable.
- I am a “team player.”
- I dislike working alone.
- Clubs and extracurricular activities are fun.
- I pay attention to social issues and causes.
- Total for Section 5

Section 6

- I enjoy making things with my hands.
- Sitting still for long periods of time is difficult for me.
- I enjoy outdoor games and sports.
- I value non-verbal communication such as sign language.
- A fit body is important for a fit mind.
- Arts and crafts are enjoyable pastimes.
- Expression through dance is beautiful.
- I like working with tools.
- I live an active lifestyle.
- I learn by doing.
- Total for Section 6

Section 7

- I enjoy reading all kinds of materials.
- Taking notes helps me remember and understand.
- I faithfully contact friends through letters and/or e-mail.

- It is easy for me to explain my ideas to others.
- I keep a journal.
- Word puzzles like crosswords and jumbles are fun.
- I write for pleasure.
- I enjoy playing with words like puns, anagrams and spoonerisms.
- Foreign languages interest me
- Debates and public speaking are activities I like to participate in
- Total for Section 7
- Section 8**
- I am keenly aware of my moral beliefs.
- I learn best when I have an emotional attachment to the subject.
- Fairness is important to me.
- My attitude effects how I learn.
- Social justice issues concern me.
- Working alone can be just as productive as working in a group.
- I need to know why I should do something before I agree to do it
- When I believe in something I will give 100% effort to it
- I like to be involved in causes that help others.
- I am willing to protest or sign a petition to right a wrong
- Total for Section 8
- Section 9**
- I can imagine ideas in my mind.
- Rearranging a room is fun for me.
- I enjoy creating art using varied media.
- I remember well using graphic organizers.
- Performance art can be very gratifying.
- Spreadsheets are great for making charts, graphs and tables.
- Three dimensional puzzles bring me much enjoyment.
- Music videos are very stimulating.
- I can recall things in mental pictures.
- I am good at reading maps and blueprints.
- Total for Section 9

Now determine your intelligence profile!
 Section 1 – This reflects your **Naturalist** strength.
 Section 2 – This suggests your **Musical** strength.
 Section 3 – This indicates your **Logical** strength.
 Section 4 – This illustrates your **Existential** strength.
 Section 5 – This shows your **Interpersonal** strength.
 Section 6 – This tells your **Kinesthetic** strength.
 Section 7 – This indicates your **Verbal** strength.
 Section 8 – This reflects your **Intrapersonal** strength.
 Section 9 – This suggests your **Visual** strength.
Remember:

- À Everyone has all the intelligences!
- À You can strengthen an intelligence!
- À This inventory is meant as a snapshot in time it can change!
- À M.I. is meant to empower, not label people!

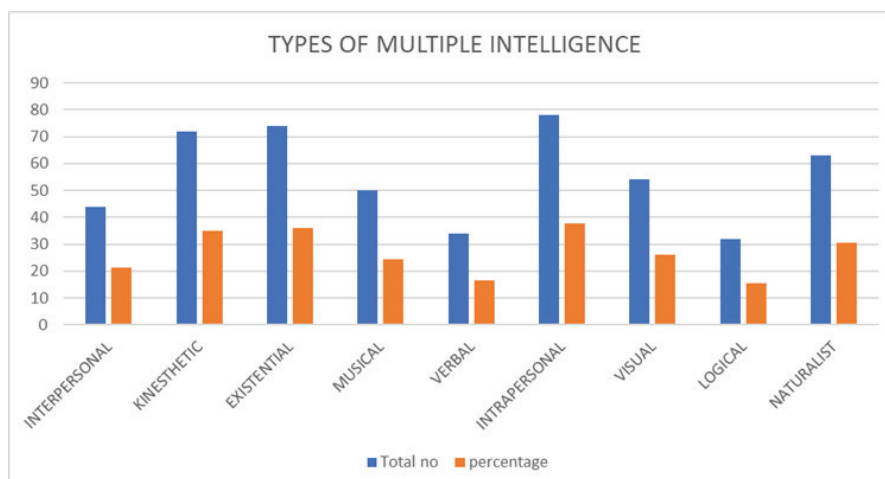
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Results and Interpretations

Based on the questionnaire form filled by the students, they were grouped according to their type of mental intelligence. Surprisingly out of 206 students only 121 students were found to have predominant single multiple intelligence and remaining 85 students were found to have combined multiple intelligence for example 7 students were found to have kinesthetic and intrapersonal mental intelligence. Those students were grouped both under kinesthetic and also under intrapersonal multiple intelligence group. So totally students were grouped into 9 groups and their dermatoglyphics pattern is studied. The distribution of subjects according to their mental intelligence is shown in chart 2.

The following parameters in the dermatoglyphics is analysed.

Chart 2: Distribution of the subject according to type of Multiple Intelligence.



Types of Fingerprints:

The patterns in the fingertips has been classified by Cummins and Midlo⁶ into various types (Fig 1)

1. Whorl
2. Arch
3. Loop
4. Composite



Whorl type – It has a concentric design. Normally it has two triradii. Sometimes more designs combined to give composite pattern.

Arch type – the ridges sweep from one margin to the other margin of the digit without a triradii.

Loop type – the ridges are in the form of a curve where both the ends of the ridges are in one side which is the open part and the closed part on the other side called as head. It can be further classified into

Ulnar loop – if it opens towards the ulnar margin of the finger.

Radial loop – if it opens towards the radial margin of the finger.

These fingertip patterns were analysed in all the nine group of subjects. We have classified the fingerprint type based on the dominant pattern seen in all the ten fingers of the individual. Some subjects have two dominating patterns for example.

whorl and ulnar loop type individuals has both whorl and ulnar loop patterns distributed equally in all the 10 fingers.

ulnar loop and arch type individuals have both arch type and ulnar loop type patterns distributed equally in all the 10 fingers.

The distribution of subjects based on the fingertip patterns were shown in chart 1.

Of all the fingertip patterns Ulnar loop is found to be predominant (Table 1). 92 subjects were found to have ulnar loop and 84 subjects have found to have whorl type pattern. 18 subjects were found to have arch type, 12 subjects have found to have whorl and ulnar loop type and 4 subjects found to have ulnar loop and arch type.

Chart 1. Distribution of fingertip patterns in the subjects.

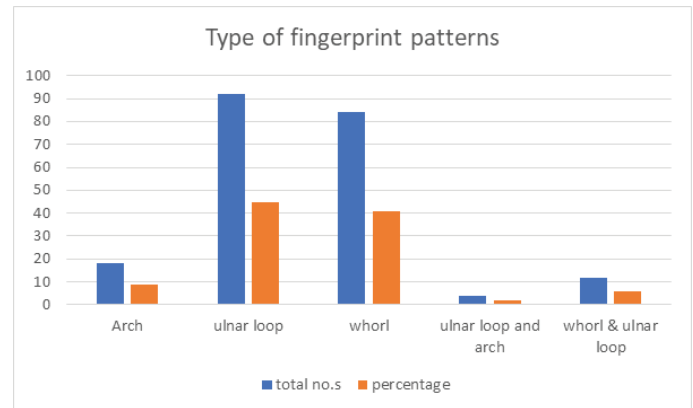


Table 1. Types of fingerprint patterns seen among the subjects.

Fingertip Patterns	Arch	Ulnar Loop	Whorl	Ulnar Loop and Arch	Whorl & Ulnar Loop
Total no.s	18	92	84	4	12
Percentage	8.73	44.66	40.77	1.94	5.82

The distribution of fingertip patterns seen in the nine multiple intelligence group (Table 2)

Interpersonal type: Of the 206 subjects 44 subjects were found to have interpersonal (both pure & combined) mental intelligence. They can read people and understand relationships. The dominant fingertip pattern observed is whorl type seen in 19 subjects. Ulnar loop is seen in 17 subjects, arch pattern in 4 subjects, combination of whorl and ulnar loop in 3 subjects. The distribution of patterns among the interpersonal type is illustrated in chart 4. While examining the fingertip patterns of the pure interpersonal group, whorl pattern is found in the thumb of both the hands in 99% of the subjects.

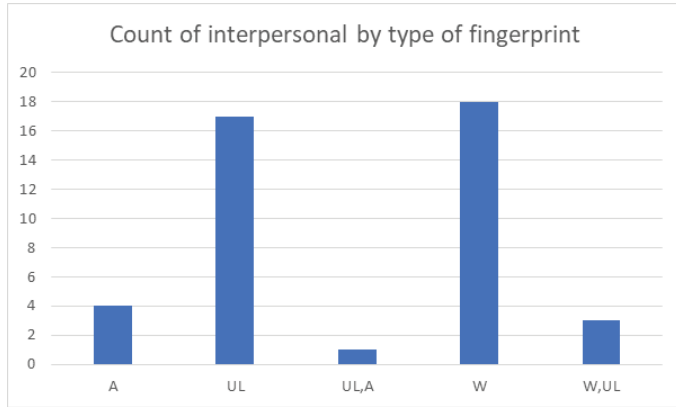
Kinesthetic type: Of the 206 subjects 72 subjects were found to have kinesthetic (both pure and combined) mental intelligence. They can skilfully use small-motor and large-motor muscles. The dominant fingertip pattern observed is ulnar loop type seen in 30 subjects. Whorl type is seen in 29 subjects, arch pattern in 8 subjects, combination of whorl and ulnar loop in 2 subjects and combination of arch and ulnar loop in 3 subjects. The distribution of patterns among the kinesthetic type is illustrated in chart 5. While examining the fingertip patterns of the pure kinesthetic group, whorl pattern is found in the ring finger in any of the hands in 99% of the subjects.

Existential type: Of the 206 subjects, 74 subjects were found to have existential (both pure & combined) mental intelligence. They are the Individuals who exhibit the proclivity to pose and ponder questions about life, death, and ultimate. The dominant fingertip pattern observed is ulnar loop in 33 subjects. Whorl pattern is observed in 30 subjects, arch pattern in 7 subjects, combination of whorl and ulnar loop in 4 subjects. The distribution of patterns among existential

Table 2. Types of Mental Intelligence predicted with its percentage.

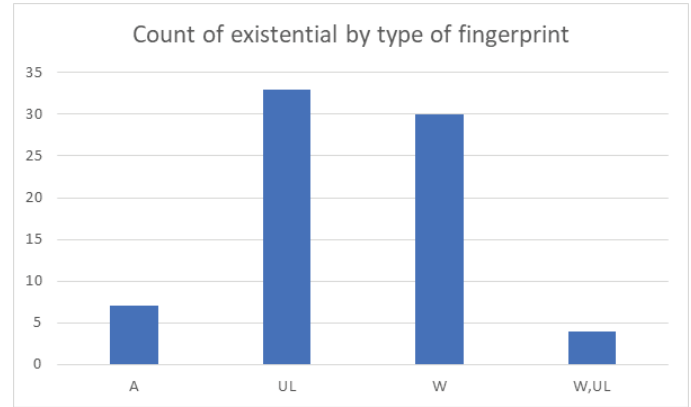
Mi	Interpersonal	Kinesthetic	Existential	Musical	Verbal	Intrapersonal	Visual	Logical	Naturalist
Total no	44	72	74	50	34	78	54	32	63
percentage	21.36	34.95	35.92	24.27	16.5	37.86	26.21	15.53	30.58

Chart 4. Distribution of fingerprint patterns among Interpersonal group.



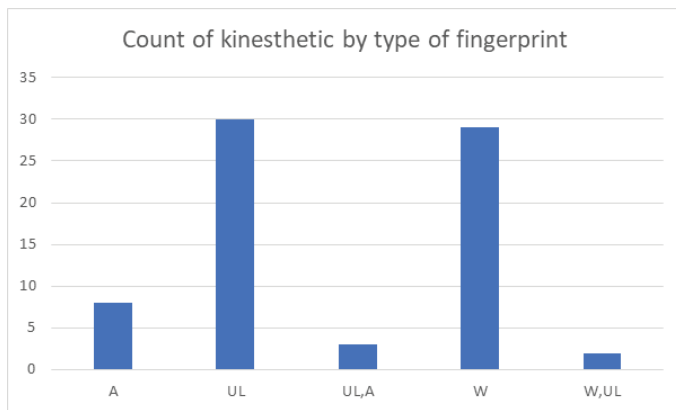
A- Arch UL- Ulnar Loop W- Whorl

Chart 3. Distribution of fingerprint patterns among Existential group.



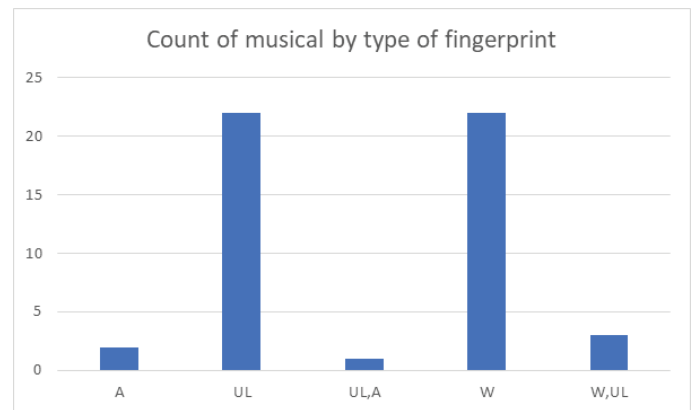
A- Arch UL- Ulnar Loop W- Whorl

Chart 5. Distribution of fingerprint patterns among Kinesthetic group.



A- Arch UL- Ulnar Loop W- Whorl

Chart 6. Distribution of fingerprint patterns among Musical group.



A- Arch UL- Ulnar Loop W- Whorl

type is illustrated in chart 3. While examining the fingertip patterns of the pure existential group, ulnar loop pattern is found in the middle finger of both the hands in 98% of the subjects.

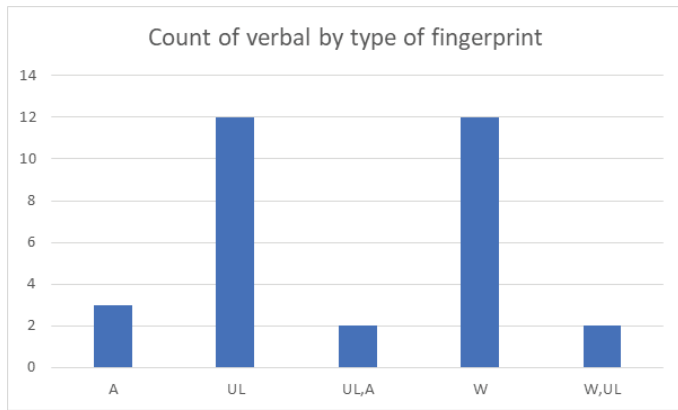
Musical type: Of the 206 subjects, 50 subjects were found to have musical (both pure & combined) mental intelligence. They have the ability to appreciate music in all forms. The dominant fingertip pattern observed is whorl type seen in 22 subjects and also Ulnar loop is seen in 22 subjects. Arch pattern in 2 subjects, combination of whorl and ulnar loop in 3 subjects, combination of arch and ulnar loop in 1 subject. The distribution of patterns among the musical type is illustrated in chart 6. While examining the fingertip patterns of the pure musical group, whorl pattern is found in the thumb and ulnar loop pattern is seen in the ring finger of any one of the hands in all the subjects.

Verbal type: Of the 206 subjects, 34 subjects were found to have verbal (both pure & combined) mental intelligence. They can use language fluently. The dominant fingertip pattern observed is whorl type

seen in 13 subjects and also Ulnar loop is seen in 13 subjects. Arch pattern in 4 subjects, combination of whorl and ulnar loop in 2 subjects, combination of arch and ulnar loop in 2 subjects. The distribution of patterns among the verbal type is illustrated in chart 7. While examining the fingertip patterns of the pure verbal group, ulnar loop pattern is found in the thumb of both the hands in all the subjects.

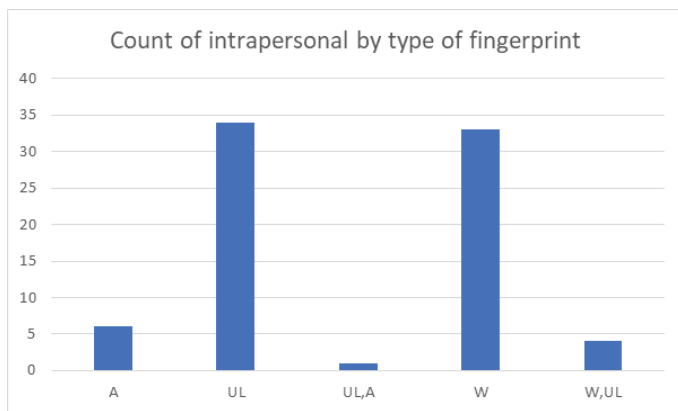
Intrapersonal type: Of the 206 subjects, 78 subjects were found to have intrapersonal (both pure & combined) mental intelligence. They can understand oneself and know how to use one's talents. The dominant fingertip pattern observed is Ulnar loop seen in 34 subjects and whorl type is seen in 33 subjects. Arch pattern in 6 subjects, combination of whorl and ulnar loop in 4 subjects, combination of arch and ulnar loop in 1 subject. The distribution of patterns among the intrapersonal type is illustrated in chart 8. While examining the fingertip patterns of the pure intrapersonal group, ulnar loop pattern is seen in the index finger of any one of the hands in all the subjects.

Chart 7. Distribution of fingerprint patterns among verbal group.



A- Arch UL- Ulnar Loop W- Whorl

Chart 8. Distribution of fingerprint patterns among Intrapersonal group.



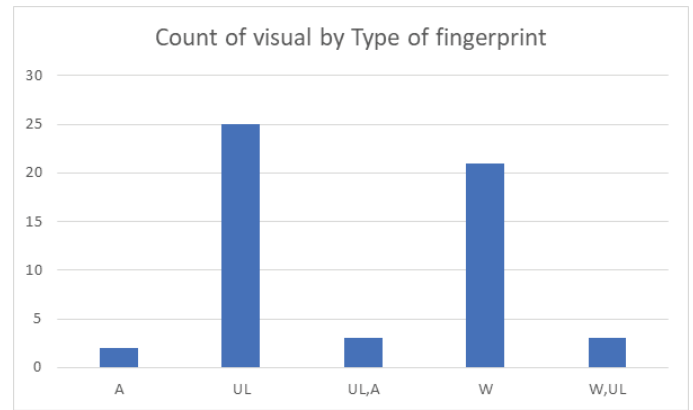
A- Arch UL- Ulnar Loop W- Whorl

Visual type: Of the 206 subjects, 54 subjects were found to have visual (both pure & combined) mental intelligence. They can creatively infer or depict visual aspects and relationships. The dominant fingertip pattern observed is Ulnar loop seen in 25 subjects and whorl type is seen in 21 subjects. Arch pattern in 2 subjects, combination of whorl and ulnar loop in 3 subjects, combination of arch and ulnar loop in 3 subjects. The distribution of patterns among the visual type is illustrated in chart 9. While examining the fingertip patterns of the pure visual group, whorl pattern is seen in all the ten fingers of both the hands in 90% of the subjects.

Logical type: Of the 206 subjects, 32 subjects were found to have logical (both pure & combined) mental intelligence. They can work well with logic or numbers. The dominant fingertip pattern observed is Ulnar loop seen in 14 subjects and whorl type is seen in 13 subjects. Arch pattern in 3 subjects, combination of whorl and ulnar loop in 1 subject, combination of arch and ulnar loop in 1 subject. The distribution of patterns among the logical type is illustrated in chart 10. While examining the fingertip patterns of the pure logical group, ulnar loop pattern is seen in the little finger of both the hands in all the subjects.

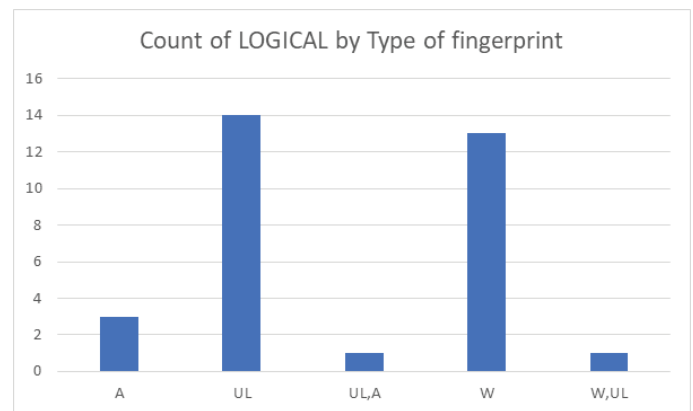
Naturalist type: Of the 206 subjects, 63 subjects were found to have naturalist (both pure & combined)

Chart 9. Distribution of fingerprint patterns among Visual group.



A- Arch UL- Ulnar Loop W- Whorl

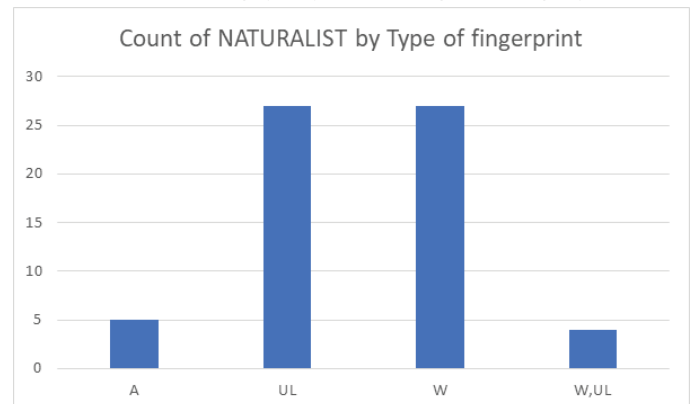
Chart 10. Distribution of fingerprint patterns among logical group.



A- Arch UL- Ulnar Loop W- Whorl

mental intelligence. They can accurately categorize and classify things found in nature. The dominant fingertip pattern observed is Ulnar loop seen in 27 subjects and whorl type is seen in 27 subjects. Arch pattern in 5 subjects, combination of whorl and ulnar loop in 4 subjects. The distribution of patterns among the naturalist type is illustrated in chart 11. While examining the fingertip patterns of the pure naturalist group, ulnar loop pattern is seen in the thumb and little finger of both the hands in 50% of the subjects and whorl pattern is seen in thumb and little finger of both the hands in 50% of the subjects.

Chart 11. Distribution of fingerprint patterns among Naturalist group.



The distribution of various fingertip patterns among nine groups were tabulated (Table 3).

Discussion

Fingerprint analysis is done in numerous vital fields including psychology, medicine and business management to do research on personality characteristics for many useful practical purposes⁷. The two crucial aspects of the fingerprints are that they do not change over time, and it is distinct for each person which shows its individuality⁸. Because of these two qualities dermatoglyphics can be used as a tool for identification^{9,10}. Here in this study, we are using this tool to identify the mental intelligence of an individual. Identifying one’s inborn talent at the right time helps to explore the carrier path options. For example, a Linguistic person who is well versed in language fluency can become a poet or orator. A logical / mathematical person can become a computer programmer or stock analyst. A musical type of mental intelligence person can become a musician or composer if his inborn talent is identified at the right time with proper guidance. A bodily kinesthetic person with motor skills can become a surgeon. Persons with Spatial/ visual intelligence can become an artist or architect. A naturalist person can become a gardener or veterinarian. Persons with interpersonal intelligence can become a salesperson or a teacher. Persons with intrapersonal intelligence who is well versed in understanding oneself can become a counsellor. Failure to identify one’s inborn talent at

the right time can sometimes force a person to take wrong decision without exploring the other available options.

Rather than a single multiple intelligence, in our study combinations of multiple intelligence in single person is in 41% which indicates multiple inborn talent in a single person. This helps to explore all the available career options. It helps to streamline the career at the school level itself.

Conclusion

This study proved that dermatoglyphics can be used as a diagnostic tool in knowing an individual’s inborn intelligences, but besides inborn intelligences, success and failure will also depend on a multitude of factors like knowledge acquired, kind of guidance and training they go through, the environment they grow up with, opportunities available to them and of course the amount of their hard- work and persistence. Therefore, it can be used as a career guidance tool. So, Parents and educators can use this tool to expand their options, not to limit them, thereby providing an individual with multiple avenues to choose and explore. So, it is recommended not to focus on finding a perfect career, rather encourage an individual to participate in activities corresponding to their personal characteristics, interests and preferences and then guide them to set their own goals to enhance their true inner potential and gift them happier and stress-free lives.

Table 3. Types of fingerprints seen in various types of Mental Intelligence.

Types of Fingerprints	Interpersonal	Kinesthetic	Existential	Musical	Verbal	Intrapersonal	Visual	Logical	Naturalist
Whorl	19	29	30	22	13	33	21	13	27
Ulnar Loop	17	30	33	22	13	34	25	14	27
Arch	4	8	7	2	4	6	2	3	5
Whorl & ulnar loop	3	2	4	3	2	4	3	1	4
Ulnar loop & Arch	1	3	-	1	2	1	3	1	-

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