A STUDY TO ASCERTAIN THE RELATIONSHIP BETWEEN THUMB DERMATOGLYPHICS PATTERN AND ACADEMIC RESULT

CHAY CHOW PHIN

THIS DISSERTATION IS SUBMITTED IN PARTIAL FULFILLEDMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE WITH HONOURS

MATHEMATICS WITH ECONOMICS PROGRAMME
SCHOOL OF SCIENCE AND TECHNOLOGY
UNIVERSITI MALAYSIA SABAH

MAY 2009

PUMS99:1

UNIVERSITI MALAYSIA SABAH

BORANG PENGESAHAN STATUS TESIS@

JUDUL: A STUDY TO ASCERTAIN THE RELATIONSHIP BETWEEN THUMB DERMATOGLYPHICS AND ACADEMIC RESULT.

IJAZAH: SARJANA MUDA ~~DENG~~ SAINS DENGAN KEPUJIAN MATEMATIK DENGAN EKONOMI

SAYA CHAY CHOW PHIN (HURUF BESAR) SESI PENGAJIAN: 2008/2009

mengaku membenarkan tesis (LPSM/Sarjana/Doktor Falsafah) ini disimpan di Perpustakaan Universiti Malaysia Sabah dengan syarat-syarat kegunaan seperti berikut:-

1. Tesis adalah hakmilik Universiti Malaysia Sabah.
2. Perpustakaan Universiti Malaysia Sabah dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institutsi pengajian tinggi.
4. Sila tandakan (/)

☐	SULIT	(Mengandungi maklumat yang berdarjah keselamatan atau Kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
☐	TERHAD	(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)
☑	TIDAK TERHAD	

Disahkan Oleh

chowphin
(TANDATANGAN PENULIS)

(TANDATANGAN PUSTAKAWAN)

Alamat Tetap: 86, KAMPUNG BARU MAMBAU, 70300 SEREMBAN, N.S.D.K.

Nama Penyelia

Tarikh: 20/04/09

Tarikh: ___

CATATAN:- *Potong yang tidak berkenaan.
**Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa /organisasi berkenaan dengan menyatakan sekali sebab dan tempoh tesis ini perlu dikelaskan sebagai SULIT dan TERHAD.
@Tesis dimaksudkan sebagai tesis bagi Ijazah Doktor Falsafah dan Sarjana secara penyelidikan atau disertai bagi pengajian secara kerja kursus dan Laporan Projek Sarjana Muda (LPSM).

DECLARATION

I declare that this dissertation is the result of my work, except the quotations and summaries each of which the source has been mentioned.

20th March 2009

CHAY CHOW PHIN

HS2006-3537

VERIFIED BY

Signature

1. **SUPERVISOR**
   (ASSOC. PROF. DR. HO CHONG MUN)

2. **EXAMINER**
   (PUAN SURIANI BINTI HASSAN)

3. **DEAN**
   (SUPT./KS. PROF. DR. MOHD. HARUN ABDULLAH)

ACKNOWLEDGEMENT

First of all, I would like to express my thankfulness to my supervisor, Associate Professor Dr. Ho Chong Mun, who has guided me throughout the whole project. He has gives me very good guidance and ideas, without him, I would not able to finish this dissertation in time. Although he is very busy, but he is willing to spend some time to discuss and help us to improve our mistakes.

Secondly, I would like to appreciate the help that given by Mdm. Y.Y. Choo, who has been giving me the knowledge and information about dermatoglyphics. She also gave us support and guidance in doing this dissertation. I would also like to express my gratitude to the director of Angsana Cemerlang Network Sdn. Bhd., Mdm Janet Tham, who gave me the data which has been collected by her colleagues in year 2008.

I would like to thank my lecturers who had given me the knowledge in using the statistical tools and application of the formulas. Without them, I would not know how to use the software to finish my project. Other than that, Miss Shey Wan Theng and Miss Lok Huey Yan also play an important role in the process of doing this dissertation. They gave me a lot of care and support when I faced problems. Lastly, I would like to give thanks to my family for giving me support and care for me all this while. They help me to reduce my pressure so that I can concentrate in doing this project.

ABSTRACT

The main objective of this study is to ascertain the relationship between thumb dermatoglyphics and the results of the students of University Malaysia Sabah(UMS). There are 103 respondents in this study, all come from different courses in UMS. Their fingerprints and palm print are collected by Angsana Cemerlang Network Sdn Bhd with the help of the 3rd year student of Mathematics with Economics, and the results of the students are recorded in term of Cumulative Grade Point Average (CGPA). Questionnaires are distributed to the students as to get their CGPA and attitudes. Right and left thumb patterns, left and right thumb ridge count and total ridge count are needed in this study. After analyzing the data, most of the ridge count of the students fall within the normal range and most of their thumb is whorl pattern. Beside that, the right thumb double loop pattern has the highest correlation with the CGPA by using Pearson Correlation test. Finally, this study success to prove that there are relationship between thumb dermatoglyphics and CGPA.

ABSTRAK

KAJIAN TENTANG KORELASI ANTARA *DERMATOGLYPHICS* IBU JARI DENGAN PENCAPAIAN AKADEMIK

Kajian ini bertujuan untuk mengkaji korelasi antara *dermatoglyphics* ibu jari dengan pencapaian akademik pelajar Universiti Malaysia Sabah (UMS). Dalam kajian ini, terdapat 103 orang palajar daripada program-program yang lain di UMS. Corak jari dan d corak tapak tangan pelajar-pelajar dikutip oleh Angsana Cemerlang Sdn Bhd dengan kerjasama yang diberi oleh palajar program Matematik Dengan Ekonomi tahun 3, keputusan akademik mereka direkod dalam bentuk PNGK. Satu soal selidik telah diisi oleh para pelajar untuk mendapati keputusan dan perangai pelajar. Corak ibu jari kedua-dua tangan, *ridge count* kedua-dua ibu jari, dan jumlah *ridge count* diperlukan dalam kaijian tersebut. Selepas menganalisiskan data yang dikutip, kebanyakan corak ibu jari pelajar adalah dalam bentuk *whorl* dan *ridge count* adalah dalam lingkungan normal. Selain daripada itu, corak *double loop* ibu jari kanan terdapat korelasi dengan PNGK yang tertinggi, ujian ini dijalankan dengan menggunakan *Pearson Correlation*. Akhirnya, kajian ini telah Berjaya menunjukkan hubungan antara *dermatoglyphics* ibu jari dengan PNGK.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS

$<$	less than
$>$	more than
%	percent
$\sum$	summation
H_0	null hypothesis
H_1	alternative hypothesis
$=$	equal to
$\neq$	not equal to
α	level of significance
β	beta
ε	error term
SSE	sum of squares error
SSR	sum of squares regression

CHAPTER 1

INTRODUCTION

1.1 What is Dermatoglyphics?

Dermatoglyphics is the scientific study of the epidermal ridge configuration of hands and feet (Yiao *et al*, 2005). Dermatoglyphics included finger print, palm print and foot print. Since we are embryo within week 13 to week 19, it takes shape from the outer of the embryo. Skin patterns is affected by the dyed gene, some of the professor have proved that, skin patterns forming is because of genetics. The total ridge count of the finger is fixed by the gene, this do not have an obvious effects by the environment.。

In the half century before, scientist found out that dermatoglyphics has a strong relationship with multiple intelligences; therefore, it has been widely used in the medical area. In that time, doctor has proved that embryo within 13 to 16 weeks, the brain system and the dermatoglyphics will be grow together, and proved that they have a perfect relationship. Because of that, scientist and doctor have done research to show that the

dermatoglyphics can ascertain the multiple intelligence and the naturally born characteristics of a child.

1.2 History

The Chinese as early as knows the usage of finger print before five millenniums. At that time, the emperor uses the finger print as individual seal. However with the hand understood, a person's individuality was identified in the early more than 1000 year. By gone through the palm reading development geographic distribution, people from Babylon have used the palm reading in the early century.

In Greeks, the word dermatoglyphics comes from two words which is derma, skin and glyphe, carve. It appears on the palms of the hands and soles of the feet. The ridging formations serve well to enhance contact, an area of multiple nerve endings (Dermal Papillae) and aids in the prevention of slippage. People of African ancestry display reduced skin pigmentation in the designated locations. All studies of the dermal ridge arrangements including genetics, anthropology and Egyptology are classified under the term dermatoglyphics.

The ridge formations of the skin of an individual begin to appear during the third and fourth month of fetal development. After death, decomposition of the skin is last to occur in the area of the dermatoglyphics configurations. There have been many

instances in which the only identifiable part of a deceased person was the friction ridge formations.

There is a book titled, The Fingerprint Story by a Commander of the Fingerprint Department, New Scotland Yard 1975-1980, name Gerald Lambourne, QPM has presented a case of the Egyptian mummified which is over 2,000 years old. A photograph appears in the book of a fingerprint from the left little finger of an Egyptian mummy.

1.3 Development of Dermatoglyphics

In 1685, Gouard Bidloo had published his first book with detailed drawings of fingerprints. While in year 1686, Professor of Anatomy at the University of Barcelona, Marcello Malpighi is the first one to chronicle observations of fingerprints under microscope. J.C.A. Mayer (1788), had write out basic tenets of fingerprint analysis. Although the arrangement of skin ridges is never duplicated in two persons, nevertheless, the similarities are closer among some individuals. In others, the differences are marked, yet in spite of their peculiarities of arrangement, all have a certain likeness.

In year 1823, John Evangelista Purkinjie, Professor of Anatomy at the University of Breslau from Ceska started to do the research base on the human' palm and foot, he is the first one to classify the fingerprint into nine basic types, and he tried to find out the relationship between human and their palm and foot print. In year 1880, Henry Faulds

and W.J. Herschel has published an articles in '*Nature*', they stated that using fingerprint to recognize the characteristics of human.

When in year 1892, Professor Francis Galton investigated finger print of a twins are the same and it can be classified as a part of the similarity of family. Galton can be concluded as the "inventor" of dermatoglyphics. Dr Harris Hawthorne Wilder, who is a researcher in America, has established a complete system of the dermatoglyphics based on the formation and hereditarily of the fingerprint in year 1902. Beside that, he also named the A, B, C, D triradii points, invented the Main Line Index, studied thenar hypothenar eminencies, zones II, III, IV.

In year 1926, Dr Cummins, whom is the Father of Dermatoglyphics was coined the term Dermatoglyphics, he has contributed a lot in the researches of Dermatoglyphics, especially fingerprint. At the same time, Dr.Cummins has discovered that, dyed gene or Down syndrome patient will have special Dermatoglyphics, the correctness of the research is above 70%. Beside that, Dr. Walker at first fixed the Dermatoglyphics Index of the Down syndrome patient.

Most medical studies utilize the following methodology: two populations are compared using some combination of the following list of common variables, or less frequently, new variables are suggested. Hand prints are taken, measurements are done, mathematical formulas are created. The first population, the one under study, is found to be strikingly different, slightly different or about the same as the control group. A paper

appears in the Journal of the American Medical Association (or similar scientific journal) that chronicles the findings.

After gone through many researches by the Scientist, found out that our brain system can be read by picking our fingerprint. A brain specialist from Canada, Dr. Penfield has shown a relationship between brain system and the part of the body in year 1950. In year 1981, Professor Roger W. Sperry and his researchers had won the Nobel Prize after they have found out that the concept of our left and right brain system. Therefore, the research about the brain system and dermatoglyphics has gone into hot season, and it has been widely apply in many areas.

Dermatoglyphics pattern has positive correlation in some disease condition most especially the genetically related. Such conditions include those associated with organic mental retardation (Stevenson *et al.*,1997). It also hypothesized that dermatoglyphics may aid in the diagnosis of such conditions.

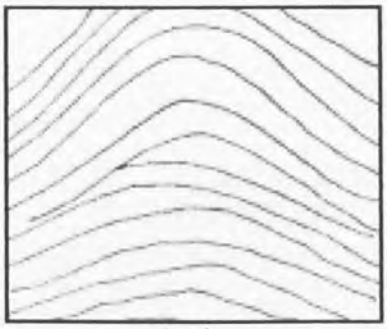
Nowadays, we can find over seven thousand articles regarding dermatoglyphics published in medical journals around the world. Many researchers have been conducting different kind of researches in the field of paediatrics medicine, genetic research, psychiatry and anthropology.

1.4 Fingerprint

1.4.1 Types of fingerprint

In year 1967, London had held a International Dermatoglyphics Forum, and had group the fingerprint into three main types which are Arch with no triradius, Loop with one triradius, and Whorl with two triradius (Reed *et al.*,1990) and from that three types can spread into eleven common types of finger print (Young Star Dermatoglyphics, 2005). The most common patterns are loops and whorls while arches are rarer (Reed *et al.*,1990).

Loop



Arch

Whorl

Figure 1.1 Three Main types of fingerprint

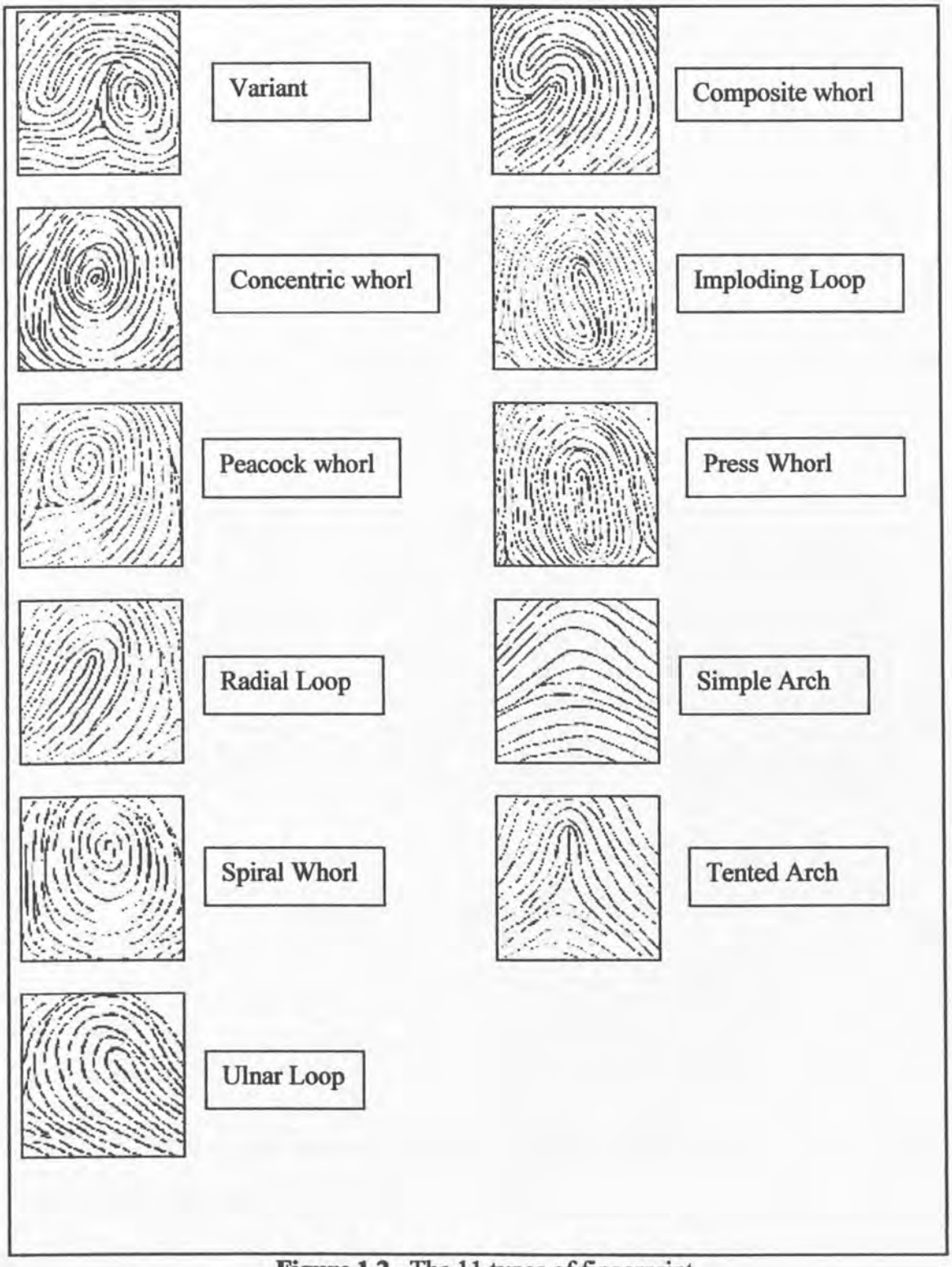


Figure 1.2 The 11 types of fingerprint

1.4.2 Triradius

Triradius is the meet point of three ridge system as shown in Figure 1.3. The circle part is the triradius point. Traradius is important in defining pattern types and for counting ridges. Arch pattern doesn't have traradius point.

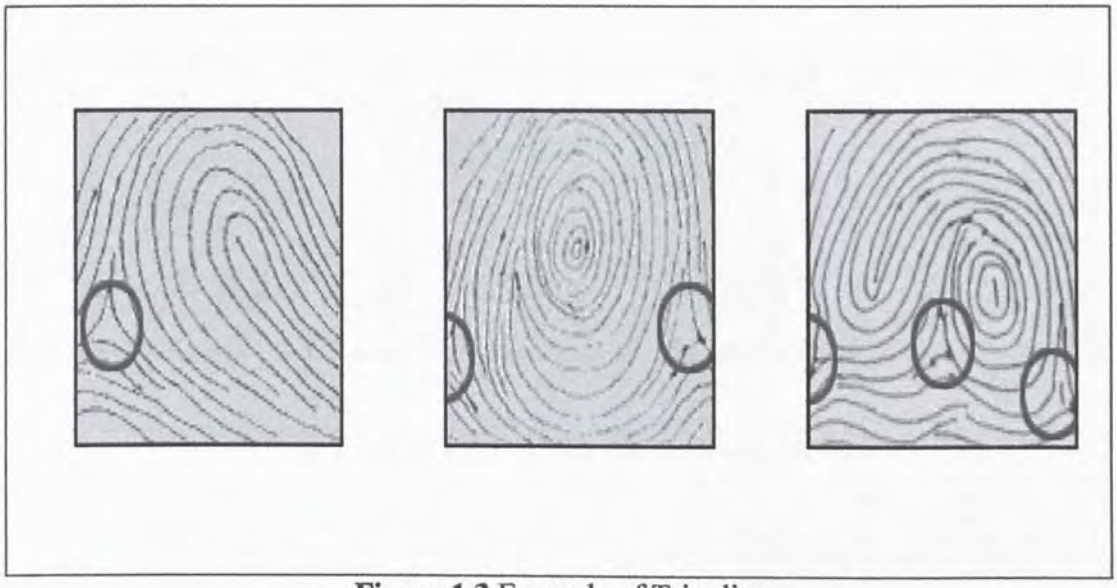


Figure 1.3 Example of Triradius

1.4.3 Core

Core which is also a ridge is the centre of the fingerprint pattern. Figure 1.4 and Figure 1.5 are some of the example of the core. The Arch pattern is the only pattern don't have core.

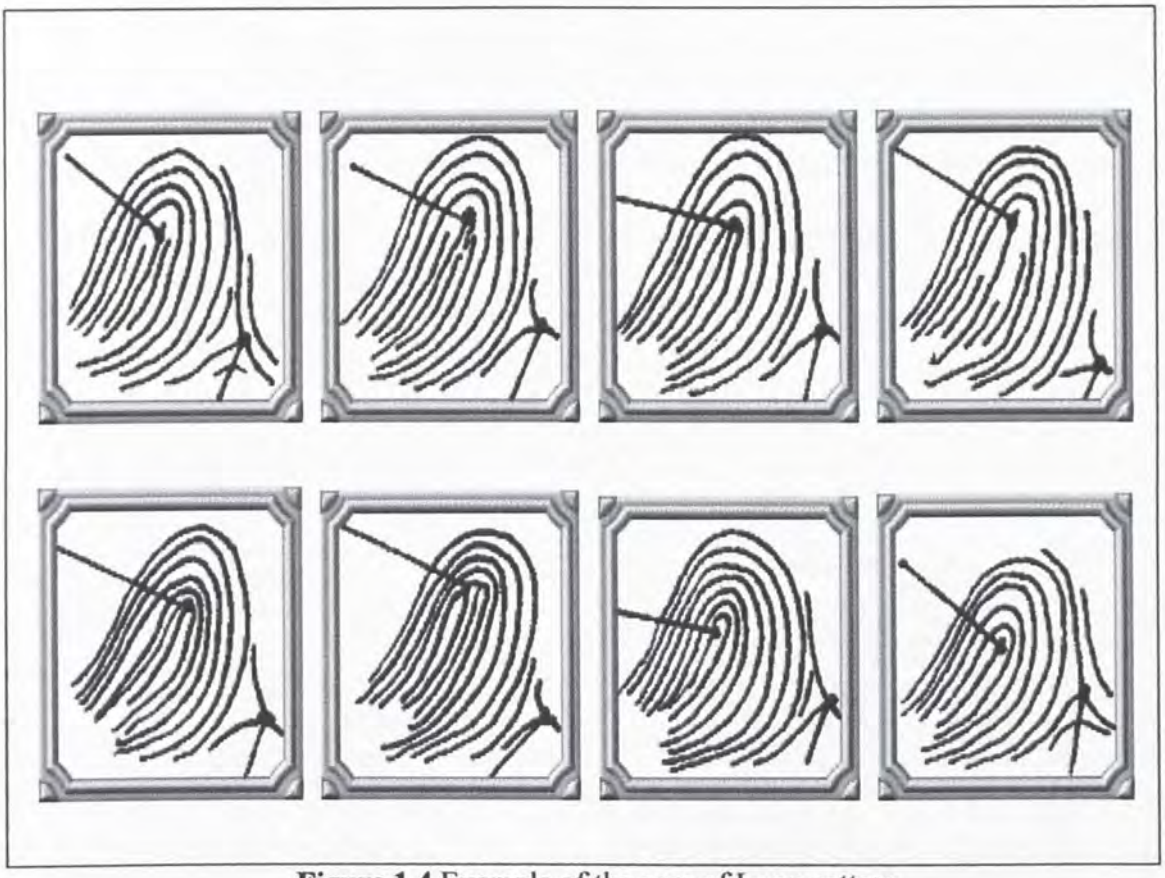


Figure 1.4 Example of the core of Loop pattern

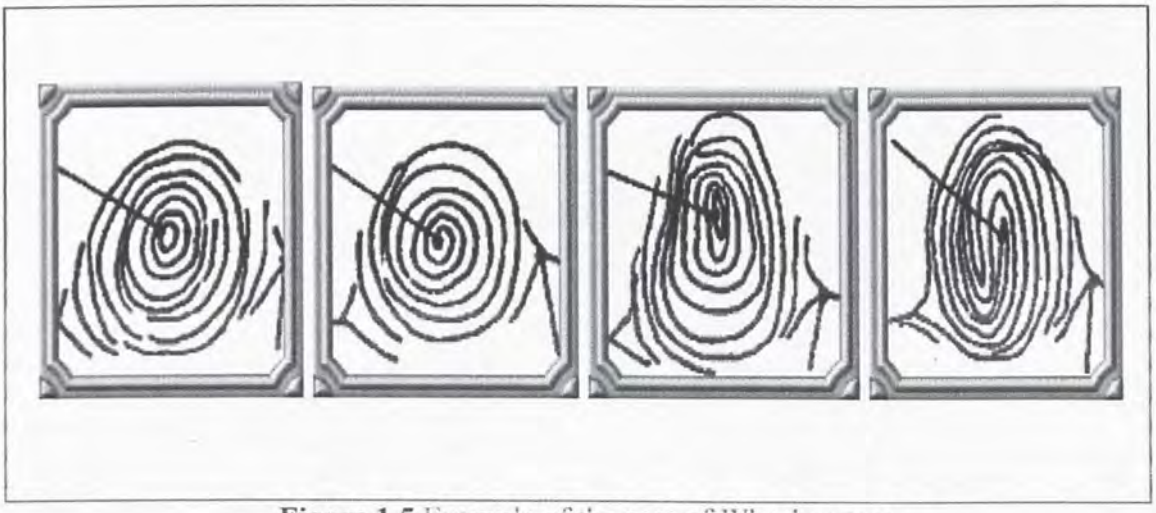


Figure 1.5 Example of the core of Whorl pattern

1.4.4 Ridge count

Ridge count is the counting of lines exists from the core to the triradius point. There are several examples shown in Figure 1.6. The Arch pattern doesn't have ridge count because its core and triradius point doesn't exist.

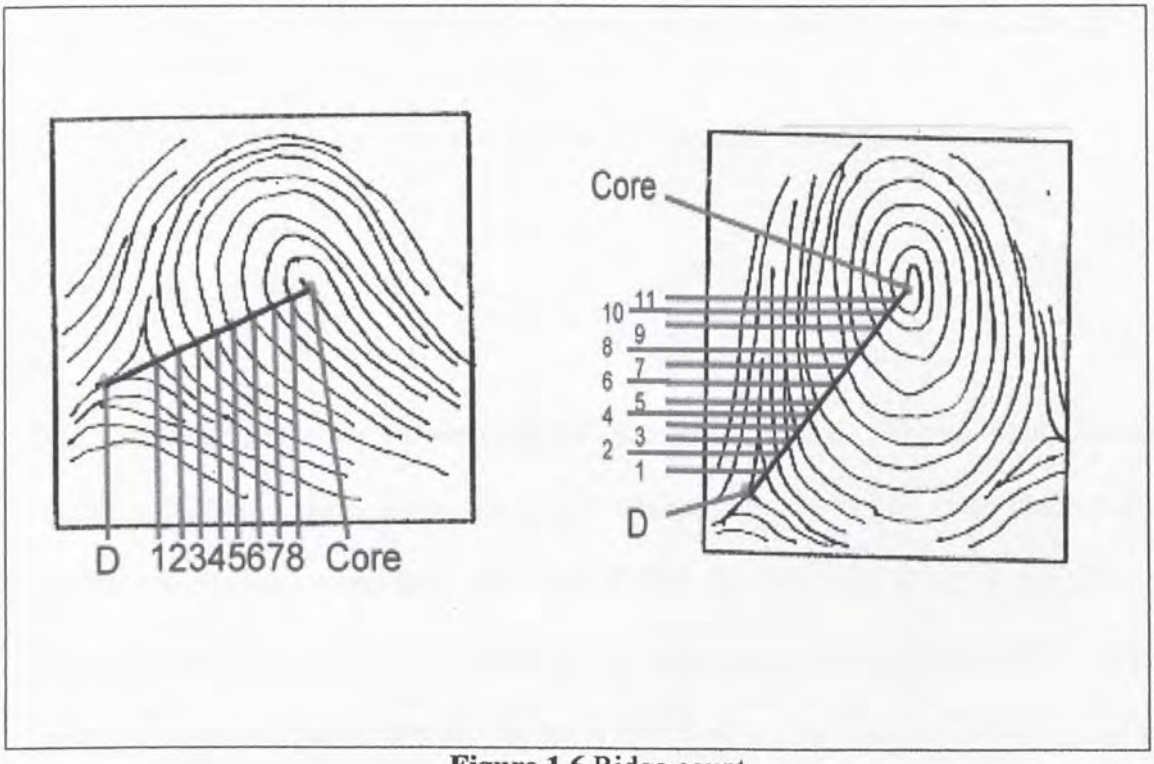


Figure 1.6 Ridge count

1.5 Objectives of Study

Objectives of this research are:

i) To determine the correlation between the thumb patterns and the academic results.

ii) To determine the correlation between total ridge count and the academic results.

iii) To determine the correlation between thumb ridge count and the academic results.

iv) To estimate a model for the relationship between academic results and thumb patterns.

v) To estimate which thumb can accurately ascertain the academics result.

1.6 Scope of Study

The subject of this study consists of 100 fingerprints which collected from University Malaysia Sabah students no matter which course they are taking now. Next, we will choose the students with three semesters CGPA to overcome the bias problem. The fingerprint will be collected with the help of Angsana Cemerlang Network Sdn. Bhd by using the scanning machine while the palm print is using ink. Data included age, gender, CGPA for three semester, fingerprint of each student will be collect. Name of the student will not be stated but will replace it with a code as to protect the privacy of the students. All the data will be kept by the university.

REFERENCES

Bahsin, M. K., 2007. *Genetics of Castes and Tribes of India: Dermatoglyphics.* Int J Hum Genet, 7(2), pg. 175-215.

Chen, M. Y., Chen, C. M. & Yeh, S.W., 2006. *An Exploratory Analysis of the Innate Intelligence Inventory System*. Journal of Data Analysis 1(2), pg 41-67.

Feighner, J.P., Robins, E., Guze, S.B., Woodruff, R.A., Winokur, G., Munoz, R., 1972. *Diagnostic criteria for use in psychiatric research.* Archives of General Psychiatry 26, pg57-63.

Gyenis, G., 2000. *A short history and some results of the dermatoglyphic studies in Hungary*. Acta Biologica Szegediensis 44(1-4), pg135-138.

HyperStat Online Statistics Textbook, 2007. *Tests of Pearson's Correlation.* http://www.childrensmercy.org/stats/definition/correlations.htm

Jacob, C., Patricia C., Stephen, G.W., & Leona, S.A., 2003. *Applied Multiple Regression/ Correlation Analysis for the Behavioral Statistical Method.* 3rd Ed, Lawrence Erlbeum Associates, pg 1-98.

Jerome, L.M., & Arnold, D.W., 2003. *Research Design and Statistical Analysis*. 2nd Ed. Lawrence Erlbeum Associates, pg 562-634.

Mark, A.A., 1999. *Is There A Gender Difference in Fingerprint Ridge Density?* Forensic Science International 102 (1999), pg 35-44.

Natekar, P. E. and DeSouza, F. M., 2007. *Digital Dermatoglyphics in Leprosy.* Anthropologist, vol 9(1), pg. 63-66.

Oladipo, G. S., Olotu E.J., Fawehinmi, H. B, Okoh P. D & Iboroma, A. D, 2007. *Dermatoglyphics in idiopathic (primary) dilated cardiomyopathy in South Southern Nigeria*. Scientific Research and Essay 2 (10), pg. 416-420.

Paul, D.A., 1999. *Multiple Regression : A Primer*. 4th Ed. Pine Forge Press, pg 71-90.

Ponnudurai, R., 1999. *Relevance of sequential development of dermatoglyphics to schizophrenia.* Psychiatry Research 89, pg. 59-67.

Ramanathan, R.,2002. *Introductory Economics with Applications*. 5th Ed. South Western, Ohio, pg144-227.

Reed, T., Meier, R. & Kilgariff, J. 1990. *How to take dermatoglyphics prints*. Indiana University, Bloomington.

Stevenson, R.E., Hane, B, Arena, J.F., May, M., Lawrence L, Lubs HA, Schwartz CE. (1997). Arch finger prints, hypotonia and areflexia associated with x-linked mental retardation J. Med. Genet. 34(6), pg.465-469.

Stowen, D., Sammon J.W. & Proctor A. *Dermatoglyphics in female schizophrenia.* Fountain Street Clinton, New York 13323.

Yiao H.Q., Zhen L., Qing W.G., Yan J.Z.G.,& Ke L., 2004. *Identification of palm print using dermatoglyphics analysis and detection system.* Medical Engineering & Physics 27, pg. 229–235.

YOUNG STAR Dermatoglyphics, 2005. *Classification of Dematoglyphics.* http://www.justfinger.com