

Effect of Familial Environment on Handwritings

Singh R*, Sharma V

School of Basic and Applied Sciences, Galgotias University, India

*Corresponding Author: Singh R, School of Basic and Applied Sciences, Galgotias University, Greater Noida UP, India. Tel: 8447723691, E-mail:

Citation: Singh R, Sharma V (2022) Effect of Familial Environment on Handwritings. J Genet Heredit Res 1(1): 102

Abstract

Given that siblings' handwriting reflects the influences of their parents' writing, it is logical to assume that the siblings' handwriting will be similar. It's likely that their writing features will be considered to be comparable as a result of their writing style. The number of questioned documents has risen over time, and now includes handwritten documents, electronic printouts, and symbols or signs used for group communication. Despite having modern technologies at our disposal, there are still a few regions that are unaffected. We rely on the class and individual features during the document examination. One of the acquired traits of humans is handwriting. The combination of nature and nurture results into this. Parents play an important role in teaching their children pre-writing skills. Genetics also influences the writer's writing habits (such as handedness and handwriting positions). Therefore, no machine can function in the same way, a variation is created. This variation is called natural variation. Every person possesses their own unique traits, such as letter formation and writing style, which may be borrowed from someone else's handwriting or developed over the maturation process. The purpose of this study was to see if there was any resemblance in the handwriting of parents and siblings.

Keywords: Handwriting, Siblings, Characteristics, Inheritance

Introduction

Handwriting is a complicated behavior which is the result of the combination of genes, environmental and anatomical factors. Handwriting can be defined as a means of expressing language done by hand with a writing instrument like with a pen, pencil, etc. Handwriting reinforces our reading and language processing skills. The inability to produce clear and coherent handwriting is known as dysgraphia. Handwriting is a complex skill that develops over time by combining fine motor skills, language, memory and concentration.

Handwriting initiates in the brain. This happens when the mental pictures of letters and words are formed. The signal to try and duplicate this mental picture is transmitted to the arm and hand through the muscle and nervous system. The actual output never exactly matches the original mental picture. Handwriting is an acquired skill and essentially a complex perceptual-motor task sometimes refers to as a neuro-muscular act. The hand movement consists of some 27 bones controlled by more than 40 muscles wherein most of the muscle are situated in the lower area and connected to the fingers by an intricate set of tendons which makes it an extremely complex and delicate mechanism.

People started writing usually by mimeographing letter formations from a child age. This talent to procreate letter formation different from person to person and usually relies on individuals' perception of the image and their capability (motor skills) to produce that seeing. One becomes proficient in writing by practice and repetition. Once the act of handwriting is mastered, people start introducing their self behaviour. Writing develops into a habitual pattern of the subconscious formations reproduced from one writing to next Handwriting analysis under forensics is a science based on patterns. It examines significant, repeated handwriting characteristics (i.e. in questioned writing by comparing and evaluating these characteristics is the known writing. Every discrete person has its own quirk in the formation of his/ her handwriting, such features include: - type of movement, line quality, speed and skill, rhythm, spacing between letters, slant connecting strokes, word and line, pen pressure, pen hold, size and proportions of letters, pen position, alignment and coordination of writing muscles.

The composition and evaluation of these peculiar features allows forensic document examiners to examine and spot a writer for any questioned handwriting. A document examiner may spot or exclude a writer by analyzing the gross features like letter formation, size and slope of the handwriting which can even be identified by a lay man and also by evaluating the less conspicuous elements within the writing. Identifying of any writer cannot be confirmed through lone feature within the handwriting rather, it is established by combining various features linking the writings, with no remarkable differences.

A thorough and methodical exercise of evidence is done in order to identify the unknown individual. The methodological approach of identification requires various evident steps, which can stand as follows:

- (1) Discriminating element or analysis involves analyzing or examining the known or unknown samples for distinctive characteristics or discriminating elements.
- (2) Comparison which involves evaluation of discriminating elements in known or unknown samples to determine if there are differences, characteristics that is absent and similarities in a side-by-side comparison of the comparable portion of bodies of writing.
- (3) Evaluation which involves assessing the significance of the discriminating characteristics individually and in combination. The importance of the similarities or distinction of every detail have to be taken into consideration and the rationale of those have to be proposed.

It is quite certain that family resemblances are quite common in handwriting which can be explained as handwriting being a neuro-muscular activity that is synchronized by the nervous system and thus is intimated by one's genetic makeup. So, genetics plays a crucial part in the way someone dots his I's and crosses his F's as handwriting gets largely influenced by individual anatomy and its effect

on the person holding a pen, children perceive their parents as an idol when it comes to learning and hence can be inspired by his/her parent's handwriting and thus, learns writing letters via imitating. But, sometimes people whose handwriting is extremely similar to their parents have not inherited it but instead simply copied it. For example, if a daughter likes the pattern or style and shape of letter written by her mother, she would try to imitate it by practicing until it is identical to her mother's. Once she is comfortable with the way she may start writing without paying attention. The child absorbs the quirks of her parent's writing habit into his own writing by repeatedly attempting to mimic the basic pattern. The more time she spends imitating the shapes, the more habitual movements become and more different writing styles approaches her parents' writing models. This tendency is evident at young age, when children are still polishing and experimenting their writings. Once maturity is attained by any writer, he starts adding more individuality into his writings, but since he/she is still under the influence of characteristics of previous writing system, and hence her/his work is mostly likely to be end up being a hybrid of the other. His/her writing habits dictate how much of a combination he develops. When it comes to learning, parents are considered role models for their children. A preschooler is inspired by the parents' handwriting.

He or she would learn to write letters by imitating his parents' handwriting. An example of this is that, if a son likes the shape of a letter that his father has written, he may practice writing it until he believes it is identical to his father's. He would start writing it without paying attention to the details after he is comfortable with the way he writes it and how it looks (because it looks like his father). The child absorbs the quirks of his parents' writing habits into his own writing habits by repeatedly attempting to mimic this basic pattern. The more time he spends practicing the shapes of letters written by his parents, and the greater his memory of the shapes, the more habitual his movements become and the more different writing styles approach his parents' writing models. This tendency is also evident in young people who are still polishing and experimenting with their crafts. As a writer matures, he infuses more individuality into his work, but he is still influenced by the characteristics of the previous writing system, and his work may end up being a hybrid of the two. His writing habits dictate how much of a combination he develops.

The concept of the handwriting of various members of the same family often being similar is an old one. "Handwriting must depend on what a particular combination of bodily form, mental character, and instruction must handwriting depend," writes Darwin. Despite the fact that the father had not taught his son to write, everyone must have noticed the sometimes close resemblance of the two men's handwriting.

Galton claims that handwriting runs in families, but adds that in his research of twins, he discovered that handwriting resemblance is uncommon, with dissimilarity being the primary point of distinction in certain cases.

In a contribution to "Knowledge and Scientific News," C. N. Mitchell accepts without reservation the viewpoint that individuality in handwriting is hereditary, and goes on to say that there's often a bent for sons to inherit positive traits of their father's handwriting, whilst daughters' writing resembles their mom extra carefully than their father's. The writer offers an instance of the handwriting of his father, mom, 4 daughters, and 3 sons, which demonstrates the fashion to which he speaks. However, instead of being an authentic contribution to the subject, the thing is a set of fascinating discoveries made on handwriting.

Discussion

Handwritten documents have elements of an individual style of writing that may have been adopted from family members, teachers, or during the growth phase. As previously stated, this kind of document is commonly found in deceitful cases, and its study leads to the individualization of the suspect. The objective of this research was to find out if there was any link between the writings of siblings. Identifying the writer through forensic document inspection requires determining the similarities and differences between two handwritings. In the case where the writers cannot be distinguished by their physical appearance, such as in the instance of identical twins, forensic analysis of their handwriting can help.

Identification of handwriting is done by a careful examination of personal features. There are of 2 types:

1) Class Characteristics and 2) Individual Characteristics.

The traits shared by several authors are class traits. These could be the result of factors such as the writing system learned, family ties, trade training, and so on. Of fact, class differences play a less role in identifying writers because it is obvious that there are others who work in similar fields. The handwriting characteristics reflected in a group of individuals which are learnt by the child at the onset of the learning process to write include the following features like line quality, skill, speed, rhythm, alignment, slant, size and proportion, tremors, initial and terminal strokes, pen pressure, pen shading, style, connecting strokes, spacing between letters, words and line etc.

Individual features. Each writer develops specific distinctive qualities over time, and each individual develops a unique handwriting style. Some of these habits are learned deliberately, while others are ingrained in the writing process. The following criteria are used to extract the individual handwriting traits:

- 1) Identifying and distinguishing characters that deviate the most from the normal copybook format.
- 2) Inconspicuous, repeatable features should be sought initially.
- 3) Characters that have been altered or personalized in various ways by different writers.

The unusual physical twist in the shape and characters would reveal the creators' unique personalities.

1) Handwriting is not identified by the general pictorial appearance of the letters rather its identified the combination of all elements and quality related with the formation of letter derived from the writing movement.

2) The written characteristics which are almost personal and class characteristics also contributed to the final conclusion.

3) The handwriting movement is displayed by various elements such as speed, rhythm, writing style, pen pressure, position and shading, skill and line quality.

4) The best writing standards are those which were written under similar conditions as prevailing at the time of writing the matter under investigation.

5) if the variation in the questioned writing falls within the range of variations in the specimen writing then the questioned writing was written by that particular person.

6) if there exists material dis-similarities between the writing characteristics and the range of variations in the questioned document does not fall within the range of variation in specimen writing then the questioned writing was not written by that particular person.

The principle of individuality is the basis of the idea of handwriting analysis. It is often also known as the principle of uniqueness. That said, given the ample quantity and quality of writing, no two authors have the same combination of handwriting traits. In the second edition of the Questionnaire, Albert S. Osborne (1929) said, "The amount of handwriting must always be considered, but it is very unlikely that all letters will match exactly, so a small amount. Even the identity of the handwriting is very high. In the 20th century, Livingston (1963), Muehlberger et al in (1977), Huber (1990), Horton (1996), etc. investigated the frequency of handwriting quality. The principle of uniqueness Beacom in (1960), Gamble in(1980), and the Boot in (1980) in comparison the handwriting of dopalganger and different more than one births persons (1998). Twins have comparable environmental effects, attend the equal faculty structures on the equal time, and, withinside the case of equal twins, proportion the equal DNA. As a result, twins' handwriting is anticipated to be extra comparable than that of different people. In fact, equal twins' handwriting is discovered to proportion a excessive stage of similarity. In those trials, which comprised over 2 hundred units of twins, skilled examiners had been capin a position to differentiate among all the twins handwriting.

Finally, field screenings and anecdotal reports by Harvey and Mitchell in the year of(1973), Baxendale and Renshaw in the year (1979), Shiver in (1996), and lefts help in demonstrating the idea of individual character. In each of cases, the questioned writing was compared to known writing from between 1000 and a couple of million people. Examiners recognised the author of the questioned document in every case.

Dr. Sargur Srihari his team has conducted research in 2002 from experiment the individuality principle. A sample of 1500 people from the final population of the United States was collected and incorporated into a database. Men and women of diverse ages and nationalities made up the sample population. Every individual submitted three transcribed examples that reflected different parts of the composed English language, for example, archive structure (e.g., word and line dispersing, line slant, edges); letter positional varieties (e.g., every letter inside the underlying, centre, and terminal like places of a word); and letter as well as number blends (e.g., ff, tt, oo, 00). With 96 per cent confidence, writer identity may be verified using these statistics across the whole. The large scale highlights (incline; word extent; and proportions of pen pressure, composing development, and stroke creation) were extricated from the whole report, a passage inside the archive, and a word inside the record utilizing a PC programming instrument called CEDAR-FOX. Miniature highlights (angle, underlying, and concavity highlights) were oftentimes separated at the person level of the archive. Srihari et al. demonstrated that the creator of a given example can be perceived with 98% certainty utilizing just some full scale and miniature features.US populace. Srihari proposed that "by considering better highlights, we ought to generally be prepared to make this decision with a close to 100 percent certainty [that the creator will be identified]".(2002).

Srihari and colleagues conducted a follow-up investigation in 2008 that bolstered the individuality principle. The handwriting of twins was also compared and evaluated in this study. Samples were collected in 206 pairs of twins from 150 cities in seven nations along with 412 non-twins from common citizens of the United States. The research looked at four specific areas:

- (1) comparison of the handwriting of twins and non-twins,
- (2) comparison of writings with varied textual content,
- (3) comparing of the handwriting of the fraternal and identical doppelgänger and
- (4) comparing system and human performance. Analysis of handwriting was done using the CEDAR-FOX system for the same style, macro- and micro-features as in the previous study, as well as for novel features not previously assessed.

For twins the system examination error rate was very much higher than that of the non-doppelgänger, according to Srihari et al. studies and the system verification error rate for non-twins was correspondingly higher. The study also discovered that while the system outperformed the layperson, it fell short of the qualified expert's performance.

We have also studied that graphology is the study of handwriting. It's a scientific approach of assessing and comprehending a person's personality by analyzing the strokes and patterns exhibited in his handwriting. Handwriting is linked to a person's personality because it is a neuromuscular movement. Neurological brain pattern represents each personality trait. These minute movements occur automatically while writing. Each stroke or written movement is an indication of a personality feature. Graphology is the science of recognizing strokes in handwriting and describing the traits that go with them. Handwriting has several characteristics that can be used to indicate a person's personality, such as baseline, slant, pen pressure, formation of a letter, size, letter spacing, word spacing, margins, and so on.

This study was undertaken to detect distinctiveness in handwriting features among siblings based on individual factors (brother and sister). Siblings who go to the similar school, are taught by the similar teacher, and have the similar parents are thought to inherit some of their writing abilities. However, as a person grows older, these features change and a person's unique personality emerges. Because the twins have comparable writing abilities and attributes, they tend to write in a similar manner. This study looked at individual characteristics including letter building, In a few alphabets, there are starting strokes, connecting strokes, rhythm, pen raising, and tremors. The letters A, O, M, F, G, and Y were chosen for this project by a single person using written data containing

the beginnings, middles, and ending letters of any word. According to the handwritten material inspection process, the formation of letters was remarkably similar amongst siblings' writes. It could be due to the same educational system or, for example, the effect of a guardian handwriting. A commonalities in the creation of letters and connecting strokes are listed below. As previously stated, there are parallels in the writings of the brothers. In which the letter construction, linking strokes, line quality, and other class characteristics that were highly influenced by each other's handwriting were thoroughly examined. Individual handwriting characteristics were explored. Formation, starting strokes, linking strokes, rhythm, pen lifting, and tremors were all noted in both twins' handwriting (brother & sister) [9,10]

Because the handwriting of kin in a family mirrors the impact of their parents' writing, it is reasonable to predict that the siblings' handwriting will resemble each other. It's probable that both of them learned pre-writing skills in similar settings and emulated each other's handwriting as a result. It's likely that their writing features will be considered to be comparable as a result of their writing style. As a consequence of the study, it can be demonstrated that sibling's handwriting is influenced by each other's writing at a high degree. Proving the validity of handwritten documents in fraudulent cases could be a watershed moment in the field of forensic inquiry. If a suspicious document is identified but neither the admitted and specimen is available, the documents obtained from the family or siblings might be submitted for handwritten questioned document examination.

Conclusion

The objective of this study was to see how inheritance affects handwriting features. The similarities in a person's personality and anatomy are determined by inherited characteristics, which influence handwriting in another way. The father-son relationship had the most parallels in the current study. Handwriting characteristics that may be influenced by the similar sex and male gene pre-eminence. Resemblance observed in handwriting characteristic attributes of parents, offspring, and kin confirms that genes play a significant impact in writing customs are transferred from one generation to the next, but also within the same generation.

Both nature and the nurture have role in affecting handwriting. Heredity as well as environment both plays a vital part in the progress of a person's handwriting. In this report examination of handwriting of family members including mother, father and off -springs is conducted to determine the degree of inherited handwriting features i.e. is whether the handwriting of family members is found to be similar with each other [14]. It is a general belief that the handwriting of the off springs resembles to their parents and more resemblance is found with the parent who teaches the pre-writing skills to the child. Moreover, children always try to imitate the writing habits of their parents and they adopt their writing characteristics [15]. So those handwriting characteristics are learnt by the children, though they develop their own individual characteristics later on. But some of features within the handwriting of the parents and children remain similar throughout lifetime and hence so they are inherited and passed on to the next generations. The present report studies about the inherited characteristics in handwriting and to establish correlation of the handwriting characteristics.

References

1. Monika S, Aishwarya Srinivasan, Anup Kumar Kapoor (2015) Inheritance of Handwriting features. International Refereed Journal of Engineering and Science. 4: 01-5.
2. Kramer E, Lauterbach CE (1928) Resemblance in the Handwriting of Twins and Siblings. Journal of Educational Research 18: 149-52.
3. Kiran P, Sridhar D (2017) A Study to Determine the Inheritance Pattern of Characteristics of Handwriting between Parents and Offsprings. J Forensic Sci Criminol 5: 304.
4. Monika S (2015) Impact of Heredity and Environment in Familial Similarity of Handwriting. International Journal of Computer and Electronics Research 4: 1-10.
5. Koppenhaver, M Katherine (2007) Forensic Document Examination: Principles and Practise. New Jersey, USA.
6. McKeever WF (2000) A new family handedness sample with findings consistent with X-linked transmission. British Journal of psychology. 91: 21-39.
7. Morris R, Morris RN (2000) Forensic handwriting identification: fundamental concepts and principles. Academic press. 238.
8. Huber RA, Headrick AM (1999) Handwriting Identification: Facts and Fundamentals. CRC Press-Taylor & Francis, Boca Raton, Florida, USA. 10-14.
9. Kelly Lindblom, S Brian (2006) Scientific Examination of Questioned document, London.
10. Hilton O (1956) Scientific Examination of Documents. Chicago: Callaghan & Company, USA.
11. Beacom MS (1960) A study of handwriting by twins and other persons of multiple births. Journal of Forensic Sciences. 5: 121-31.
12. Boot D (1998) An investigation into the degree of similarity in the handwriting of identical and fraternal twins in New Zealand. Journal of the American Society of Questioned Document Examiners. 1: 70-81.
13. McKeever WF (2000) A new family handedness sample with findings consistent with X-linked transmission. British Journal of psychology. 91: 21-39.
14. Morris R, Morris RN (2000) Forensic handwriting identification: fundamental concepts and principles. Academic press. 238.
15. Huber RA, Headrick AM (1999) Handwriting Identification: Facts and Fundamentals. CRC Press-Taylor & Francis, Boca Raton, Florida, USA. 10-14.
16. Kelly, Lindblom S Brian (2006) Scientific Examination of Questioned document, London.
17. Hilton O (1956) Scientific Examination of Documents. Chicago: Callaghan & Company, USA.
18. Baxendale D, Renshaw ID (1979) The large-scale searching of handwriting samples, Journal of the Forensic Science Society. 19:245-251.

19. Beacom MS (1960) A study of handwriting by twins and other persons of multiple births, Journal of Forensic Sciences. 5:121-31.
20. Boot D (1998) An investigation into the degree of similarity in the handwriting of identical and fraternal twins in New Zealand, Journal of the American Society of Questioned Document Examiners . 1(2):70-81.
21. Byrd JS, Bertram D (2003) Form-blindness, Journal of Forensic Identification . 53:315-41.
22. Evett IW, Totty RNA (1985) study of the variation in the dimensions of genuine signatures, Journal of the Forensic Science Society . 25:207-215.
23. Federal Bureau of Investigation (2009) Famous cases: The Weinberger kidnapping, FBI History [Online]. (n.d.). Available: Accessed.

Submit your next manuscript to Annex Publishers and benefit from:

- ▶ Easy online submission process
- ▶ Rapid peer review process
- ▶ Online article availability soon after acceptance for Publication
- ▶ Open access: articles available free online
- ▶ More accessibility of the articles to the readers/researchers within the field
- ▶ Better discount on subsequent article submission

Submit your manuscript at
<http://www.annexpublishers.com/paper-submission.php>