



DETERMINATION OF EFFECTS OF INTOXICATION OF YOUTH ON HIS/HER SIGNATURE AND THE DIFFERENCES IN A PERSON'S SIGNATURE BEFORE, DURING, AND AFTER THE INTOXICATION

*Lavang Sai Chand, **Dr H R Bhargava

Department of Science,
Garden City University, Bangalore, (India).

ABSTRACT

Handwriting analysis is an important branch of forensic document examination, used to determine the authorship of questioned writings and signatures. This research investigates the effects of alcohol intoxication on an individual's signature writing. A field-based experimental study involved 50 youth participants aged 23-28 from Bengaluru city. Signature samples were collected from each participant in three stages: before intoxication (normal condition), during intoxication, and after intoxication (hangover stage). The signature samples were analyzed using observation through a magnifying lens, microscopic examination, and comparison of handwriting features like pen pauses, size variations, presence of tremors, slant changes, pen pressure, hesitations, alignment, pen lifts, maximum height, and length. The major findings revealed significant variations in characteristics like pen pauses, tremors, slants, pen pressure, size, and proportions between the normal and intoxicated states. However, core similarities in the signatures before and after intoxication allowed for establishing the same writer's authorship. The study concludes that while alcohol intoxication causes deviations in handwriting patterns, the writer's core characteristics remain identifiable, aiding forensic signature analysis. The research highlights the importance of considering intoxication effects during handwriting examination and the need for further investigations with larger sample sizes and controlled alcohol intake levels.

Keywords: Handwriting analysis, Forensic document examination, Alcohol intoxication Signature writing, Pen pauses, Tremors, Slant changes, Pen pressure.

INTRODUCTION:

Handwriting:

Humans have left a lasting stamp on history through the loops, strokes, and other symbols that make up the written form of language - handwriting – for almost 6,000 years. Handwriting is one of the most familiar and idiosyncratic ways of expression, whether it be the movement of a stylus inscribing wet clay or the motion of a pen across paper. Handwriting analysis is an important element of forensic science. A trained forensic document examiner (FDE) one may be able to extract valuable information for determining whether a note or signature is genuine, as well as the likely author, by analyzing the characteristics of a handwritten note or signature not only the slant of the writing and how letters are formed.

Forensic science is a branch of science in which we apply scientific knowledge to the evidence gathered at a crime scene in order to evaluate and identify the suspect. There are various disciplines of forensic science that deal with different sorts of evidence, and question papers is one of them. It involves the analysis of documents collected from the victim, the crime scene, or ancient records. Furthermore, scientific methodologies and our scientific understanding are applied to the documents collected for further research in order to obtain substantial information that may be used as a lead in our cases. Documents received as evidence may have been edited, changed, damaged, or fabricated, and this raises a number of issues. Individuals use muscle coordination, innate ability, and the conceptual component of what they are trying to write to create handwriting. Forensic handwriting analysis is a pattern-based science that compares and evaluates important, repetitive handwriting traits (i.e. handwriting habits) in questioned writing with known writing. Handwriting is a deliberate act, yet the process of writing each word and letter over and over again becomes almost instinctive. The writer is more concerned with the message they are trying to convey than with the writing process itself. It is at this point that handwriting reveals several subconscious habits. Handwriting is individual and unique because of these recurring patterns.

1.1 Principles of handwriting:

- Every handwriting has its individuality.
- No two people write exactly alike.
- There are natural variations in the handwriting of a person.
- The act of writing is a skill learned through repetition until it becomes a habit.
- A person's handwriting changes throughout his or her lifetime.

The handwriting identification is the most important branch of the questioned document. It may be necessary to identify signature or the handwriting in the document is genuine, traced, or disguised. Individuals' handwriting is a behavioural attribute that is unique to them. Visually, the character shape and writing style varies from one to the next. The process of identifying or verifying the authorship of a handwriting document is known as handwriting identification. Data gathering and pre-processing,

feature extraction, and classification are the three processes required to establish authorship identity based on handwritten text. The most difficult aspect of handwriting recognition is obtaining the elements that reflect the many

types of handwriting. There have been numerous feature extraction strategies created and used for handwriting identification in the literature; nevertheless, the value of a single feature in handwriting identification has not been fully examined.

Effect of alcohol on handwriting:

The results revealed that the handwriting parameters such as word lengths, height of upper and lower case letters, height of ascending letter, height of descending letter, spacing between words, number of angularity, number of tremor, and number of tapered ends are all significantly increased under the effect of alcohol.

How to analyze signature:

Handwriting analysis involves three key stages including the analysis, comparison, and evaluation of the handwriting characteristics.

Step 1- Analysis:

First, ascertain if the examination compares a questioned signature to another questioned writing or a questioned signature to a known document.

Next, ascertain whether the writing under scrutiny is original. If not, either ask for the original or assess the copy's quality. Are there important writing details?

Third, decide whether the writing under scrutiny is warped or normal writing. Consider the type of writing in the questioned text (if there are many types, divide it into groups) and whether it exhibits internal consistency (may there be more than one writer) before making your decision. Determine the range of variance and whether or not individual traits exist next. When examining the recognised writing, follow these identical processes.

- **Letter formations** – how is the letter constructed, how many strokes, one continuous stroke of many strokes combined to make the letter.
- **Line quality** – the dynamic process which guides the writing instrument across the paper and encompasses many elements such as pen pressure, speed, pen lifts, consistency of the written line, rhythm, and writing skill.

- **Alignment** – alignment refers to the real or imaginary baseline upon which the writer places the writing.
- **Arrangement of the writing** – With extended writing, the arrangement of the writing including margins, spacing, address placement, crowding or insertions may be as individual as the writing itself.

Step 2- Comparison:

Conduct a side-by-side comparison of the comparable portions of the bodies of writing. Determine if there are differences, absent characteristics, and similarities.

Step 3- Evaluation:

Evaluate the significance of the handwriting characteristics individually and in combination. Determine if there is a sufficient quantity of writing. If there is not a sufficient amount of questioned writing, known writing, or both; request more writing and repeat the above steps to the extent possible.

Verification:

After the examination and conclusion are reached, the conclusion is verified by a senior examiner. This includes a technical and administrative review.

The parameters that will be analysed for variations before and after alcohol consumption are:

1. Alignment
2. The tremors in writing caused due to stress and unwillingness to write
3. Spacing between letters
4. The initiating and pause points
5. Shivering in letter formation
6. Speed of writing
7. Pen pressure
8. Pictorial effect
9. Connecting strokes

MATERIALS AND METHODOLOGY

Methodology is very important to conduct the research in a systematic approach. Method will give the information about the tools and technique used for the collection of data in systematic way. This section reveals about the procedure followed to conduct the study which includes objectives of the research, techniques and methods used in the collection of data, data processing and analysis and research design.

Need for the study

The purpose of the research is to determine the effects of intoxication of youth on his/her signature. This study is an attempt to know the variations in the signature of a person before, during and after the intoxication. This study helps to know whether the signature is done by the same person or not.

Objectives of the study

The objectives of the study are;

1. To find out the effects of alcohol on the signature of an individual.
2. To know the variations in signatures due to intoxication in an individual.
3. To verify the writer's authorship under alcoholic conditions.

Hypothesis

1. Alcohol intoxication causes significant variations in signature characteristics compared to normal state.
2. Core similarities remain in signatures before and after intoxication to establish authorship.
3. Specific features like pen pauses, tremors, slant, pen pressure, and size are more susceptible to alcohol effects.
4. Higher alcohol intoxication levels lead to greater variations in signature characteristics.
5. Signature deviations persist into the hangover stage after intoxication, though potentially lessened.

Research question/problem statement

1. What are the variations in the signatures of an intoxicated person?
2. How to determine whether the signature is done by the same person or not?

Research design

The preparation of such design facilitates research to be as effective as possible yielding maximum information. The research design refers to the overall strategy that you choose to integrate the different components of the study coherently and logically, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data. Field field-based

experimental analysis method was employed for the study.

Universe, sample size, sampling techniques

For this study, the researcher has selected youth between the age group of 23- 28 years who are residing in Bengaluru city. The researcher has randomly selected 50 individuals from the universe by adapting a simple random sampling technique.

Tools of data collection

The researcher has used the materials paper, pen, measuring scale, magnifying lens, and stereoscopic microscope for data collection and analysis. Further, the collected data have been analyzed using the software Excel.

Procedure

The researcher approached the respondents and explained the purpose of the study. After obtaining consent from them, samples of signatures were collected in three stages of intoxication i.e. natural condition, during intoxication, and after intoxication (hangover stage) was collected. In this way, 9 signature samples from each individual were collected. First, they were requested to give their signature thrice on a sheet when they were in natural condition. Then on the same sheet, the signature of the same person was taken thrice when they were under intoxication and after intoxication. Similarly, signatures were collected from all 50 participants. Now using a magnifying lens comparison and analysis of signatures was done.

Data coding, presentation, and analysis

After collecting data from respondents, a code was assigned to each respondent and all features were observed. The data is presented in charts, graphs, and tables. The information collected from respondents was analyzed using Excel software.

Report design

It is the written record of the research which describes the different contents of the report. The researcher has divided the report into 5 major chapters which are given below.

Chapter I: Introduction which contains the information about the topic.

Chapter II: Review of Literature includes the previous studies done on the topic

Chapter III: Methodology explains the methods and procedures used to conduct the study which includes objectives, scope, data collection, data processing and analysis, and report design

Chapter IV: Analysis and interpretation, the method by which the data obtained was analyzed

Chapter V: Major findings, suggestions, and conclusion it includes the important facts found during the study, different suggestions, and conclusions by the researcher.

LIMITATIONS:

- Due to restricted time, the sample size taken by the researcher is 50.
- Equal numbers of male and female individuals were not taken in the research.
- During the collection of samples, respondents were under different levels of intoxication.
- The respondent's hangover period was not noted down, which is inevitable by the researcher.
- Since Bengaluru is a large city and is divided into different districts, the research has been limited to certain locations and nearby places

RESULT AND DISCUSSION

- Out of 50 respondents, 40% of samples show pen pause under intoxication and 46% of samples contain pen pause after intoxication.
- The size of signatures was increased in both during and after stages of intoxication.
- Out of 50 samples, 10% of signatures contain tremors before intoxication which increased to 28% during the stage and 42% tremors in the hangover stage.
- Out of 50 respondents, 78% of samples were in a straight slant before intoxication which later under intoxication decreased to 62% and 56% in hangover state.
- The slant of signature samples changed from straight to towards right due to intoxication.
- Out of 50 respondents, only 2% of samples show heavy pen pressure before intoxication. However, 30% of samples show heavy pen pressure due to intoxication.
- Intoxication affects the pen pressure of individuals.
- The size and proportions of samples vary from normal to intoxicated state.

SUGGESTIONS:

- More number of samples might give accurate results.
- Alcohol may have different impacts on males and females. Hence it is suggested to consider an equal number of male and female respondents.
- Alcohol consumption was not taken into account in the current study. Therefore, it is advised to collect samples while respondents were intoxicated to a certain degree.
- The duration of a hangover can be recorded in future studies.
- In further studies, the universe of research can be extended.

CONCLUSION:

As we all know handwriting is arranged mentally and performed neuro muscularly, it is affected by alcohol consumption. Alcohol causes emotional, behavioral, and cognitive changes such as tremors, unskilful movements, etc. The present study on “comparison of signatures of youth in Bengaluru city during various stages of intoxication” included 50 participants from the universe Bangalore city. The purpose of the research is to determine the effects of intoxication of youth on his/her signature. This study is an attempt to know the variations in the signature of a person before, during, and after the intoxication. This study helps to know whether the signature is done by the same person or not. All the samples were analyzed to draw the results.

From the analysis found that even after intoxication, there were many similarities in the signature samples. The similarities can lead to the conclusion that the writer is the same.

REFERENCE:

1. Albert Osborn - Questioned Document
2. Nabar B.S – Forensic Science in Crime Investigation.
3. Rana, Ayushi. (2021). *Effect of Intoxication on English Handwriting*. 10.13140/RG.2.2.22869.14563.
4. Pant, Priyanka & Kumar, Rajeev. (2020). Variations in handwriting of an individual before and after alcohol consumption. 15. 1133-1139.
5. Manjugouda R Patil, Dr.Channappa .F.Mulimani: Influence of Alcohol on Handwriting -- Palarch's Journal of Archaeology of Egypt/Egyptology 17(6). ISSN 1567-214x
6. Jan Beck, Handwriting of the alcoholic, Forensic Science International, Volume 28, Issue 1, 1985, Pages 19-26, ISSN 0379-0738, [https://doi.org/10.1016/0379-0738\(85\)90161-6](https://doi.org/10.1016/0379-0738(85)90161-6).
7. Phillips, James & Ogeil, Rowan & Mueller, Friedemann. (2009). Alcohol consumption and handwriting: A kinematic analysis. Human Movement science.