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A Review Study to explore the dimensions of the Role of Size and Proportion of letters in Handwriting Examination.

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ABSTRACT

Handwriting Identification is intensively related to observational learning and practical experience. It is a task of Forensic Document examiner to evaluate the sample both qualitatively and quantitatively. The matter of concern is how to execute this sort of analysis relating to practical experience. This review gives an answer to this question and an overview of the utilization of an integral characteristic, i.e. Size and Proportion of letters" with respect to natural variations for differentiating the two writings in question of forensic interest. The review covers the brief outlook of role of size and proportion in handwriting identification and comparison along with selected and recent applications in revealing the authenticity of a writer using this technique. These applications and reviews demonstrate the potential utility of size and proportion in the identification of penmanship, but are restricted to some factors of consideration, consequently permitting the innovation in some way and highlight the need to proceed with the current study to give a more reliable, versatile and a non-destructive technique so as to maintain the integrity of forensic samples.

Keywords: Size and Proportion, Natural Variation, Handwriting Identification, Authenticity, Penmanship

Introduction

Handwriting is a principal factor in many criminal offences and has been the subject of expert study.The handwriting examination is compactly related to observational learning and practical experience[1]. It is typically a behavioural exercise that is identifiable because of the presence of characteristic features and qualities within the written matter[2]. It is a neuro-muscular task which

originates in the mind as a mental picture but natural variation is the major factor which does not allow the exact duplication of image generated in mind on paper because of its inevitable nature which indirectly gives the authenticity to handwriting[3, 4, 5.] It is outlined as the imprecision with whom the habits of a writer are executed on repeated occasions[3]. Preliminary examination of handwriting of a disputed document is done to find out whether the document is fit for detailed examination or not[3]. Usually the document is checked for any kind of forgeries, disguise, tampering with them.

The examination is done to find out the authenticity, adequacy and integrity of the input materials and lays down the foundation for detailed examination[3]. The penmanship is analysed by comparing the questioned and the standard writing for class characteristics and the individual characteristics to prove the identity of a person[3,5].Some of the class characteristics involves Line Quality, Skill, Size & Proportion, Spacing, Slant, Rhythm, Alignment, Movement, etc. When the writings are closely examined, some basic differences allow the individualisation of the handwriting[3]. These characteristics are the most important factors to determine the penmanship. These individual characteristics involve Letter formation, Connecting Strokes, Embellishments, Initial and Terminal strokes and any peculiar and unique style of writing[3].

The article has selected the most imperative and applicable research done over the years describing the importance of size and proportion in analyzing the questioned sample.

Presently, Size & Proportion is merely considered as a part of class characteristics used for handwriting examination[5,6]. Many authoritative books have discussed how size and proportion in handwriting is more reliable than just taking size in consideration as the latter is dependent on the space provided[1,4,5,6,7,8,9]. The best of knowledge of various authors related to size and proportion, its meaning, properties and characteristics has been discussed in this paper to develop a basic understanding of this characteristic. The main aim of this paper is to explore the various dimensions of size and proportion with respect to natural variations and its utilization as an Individual characteristic for handwriting examination. It is hypothesized that size and proportion of letters would display a major effect on disguised and forged writings and thus can be treated as an inevitable factor for the identification purposes. Numerous reviews of literature attempt to demonstrate and support the hypothesis.

Earlier, two specific issues related to the problem were addressed. First, would size in writing being investigated under varying conditions pertain to divergence or not. Second, would proportion of letters under different writing systems remain fairly constant[5]. Models of specific distance or spaces for measuring heights of small, short and long letters were described[5]. Modern Vertical writing, Spencerian writing and old style writing were considered. The samples were measured in accordance by estimating heights of letters using specific spaces[5]. The relationship obtained were vertical (1:2), Old round (1:2.5), Spencerian (1:3), and others (1:5)[5,6]. The outcome in support of first issue provides little significance in examination process where the questioned sample is in limited amount. In contrast, the sample with enough writing proves to give conclusive result[5]. In protrudence of second matter of query, it was inferred that genuine writing show a certain definite and fixed proportion of height of letters to the length of words, thus the attribute may prove to be very forceful evidence in revealing the identity of writer and differentiating two writings[5]. The gap in the study was it rests on the facts of estimates of spaces rather than exact measurements and there was an absence of the major factor “Natural Variations” which would affect the reliability more in cases of disguised writings. The results combined has a significance in current study, which

will focus on utilizing a software for measuring the size and proportion of letters and thus setting the range of natural variations which would be specific for each individual.

Size and proportion of letters in relation to natural variations were addressed according to the average height and proportion of letters individually[1]. Supporting Dr.Locard's report on "Graphometry" and Osborn's research, two queries were raised. First, distinguishing Osborn's different system of writing using proportion of letters as an element[1,6]. Second, Computation of average heights and widths of letter combinations[1]. Samples included were single space letters and their combination with double and triple spaced letters. Comparison was done using adequate amount of questioned and standard writing. The result provides strong evidence of non-identity as the samples differ significantly. The result obtained confirm the hypothesis that the size and proportion may play a major role in identification of suspected writing, but lacks in a way that it uses the averages not relative size comparison which would finally affect the result due to the writer's habit of showing variations every time he writes[1]. Besides the gap, it does holds some significance to the current study as it can be considered a prior step in the inculcation of proportion of different letters and their combinations.

With so many letters available for comparison and the variables in each letter, relative sizes were taken into account by other contemporaries to deal with the process of examining the questioned sample for size and proportion and natural variations[4]. Proportion of letters within a word and their relative heights were taken into investigation[4]. The sample included short letters like 'a' and 'o' and the tall one includes 'h', 'b' and 'l'. The ratios of the letters were maintained despite a change in size, speed and intent of writing and prove to be conclusive in accordance of the issue[4]. The safe indicator for differentiating the writing was not even the ratios yet the difference in the ratios[4]. The study included"Ratio or proportion" as the only component into record for contrasting both the addressed and the standard writing and some specific letters not all which were the significant downsides of Harrison's work. This turns out to be the mainstays of the present study, which focuses on the proportion of different letters and their combination which are relatively common in use with respect to the natural variations in it.

Supporting Harrison's area of research, studies on various letters and parts of the compound letters were performed[8]. The samples taken were some specific chosen letters like 'k' and 'g' and measured for variation in proportion of letters of different writings[8]. The study supported the current study but the gap lies in choosing some particular letters which was the same as of Harrison's exploration[8], that would drastically affect the findings when the suspected writing bears no or finite number of letters and words other than the compound letters[8].

The study for revealing the authenticity of a writer by using size and proportion of letters as a major element of differentiating two writings was addressed considering Block letter writing[7]. A method of using proportional height versus width of different block letters was described[7]. Alongside technique of measuring heights, natural variations, pen movement, angle of curvature for different letters and retracing upstrokes were additionally considered. Subsequently, it could have a great deal of centrality in the present study as it was only the study which incorporates natural variations[7]. The conclusion was based on the finding that when all the examples of a particular block letter in a sample of writing were considered, a range of variation for a particular block letter would narrow down the result[7]. The combined outcome strongly supports the purpose of the present study due to the inculcation of natural variations along with the proportion of block letter writing. The probable gap of consideration was, it only focuses on the block letters into

account which would affect the result when the addressed sample contains small letters[7]. Consequently, there is a requirement for better development and incorporation of best suited techniques which utilizes size and proportion in relation to natural variations to reveal the authenticity of a writer which is the fundamental objective of the current study.

In coherence with above, ratios of two or more letters were addressed[9]. The emphasis was on to assist legibility, which can be obtained in three ways, Close adherence to normal size-proportion, Consistent adherence to a fixed standard of size-proportion, Exaggeration of large letters[9].

The findings indicate that the ratio for a given writer remains relatively constant as a part of his handwriting habits assuming he has reached graphic maturity[9]. Supporting his fellow members, Harrison and Hilton, he approaches to the result saying “Once fixed, the ratio of handwriting is very seldom altered and experiment shows that it is extremely difficult deliberately to effect a consistent change without a complete loss of fluency”[9].

Another method of inculcating range of size and proportion in relation to natural variation to reveal the authenticity of a writer was described[10]. Two issues were raised in her research that provides relevancy to the main topic of this paper. Firstly, does age affect the size and proportion of letters in relation to natural variations and Secondly, does sex of an individual have specific size and proportions of letters. These two parameters were taken into consideration, i.e. age and sex to reveal the authenticity of a writer[10]. Size and proportion of different letters were measured manually using transparencies of mm scale and their range has been obtained[10]. The findings providea significant difference in the range of size and proportion of letters in respect of both age group and sex. These conclusions pay more attention to the current study and permit the requirement for proceeding and giving a new face to the study.

The earlier findings indicate that the only class characteristics that play an imperative role in revealing the identity of a writer is “Size and proportion of letter” that could be utilized as a featuring individual characteristic in providing the convincing proof of non-identity. It can be assumed from the above mentioned literature reviews that since natural variations influence the writing to a great extent and a limited work is done till now using natural variations into consideration so whether this factor changes the range for each individual after a period of time or remain constant is a matter of concern More longitudinal studies should be done so as to understand the actual reliability and versatility of size and proportion. There is an essential requirement to use it as a tool for identifying the authenticity both manually as well as incorporating into a digitized form using software. Moreover, proportion and other components like ratios, relative size, absolute size that plays a major role in inferring the results involved in the study should be incorporated more. This would help to influence the adequacy, reliability and versatility and better assessment of the topic further in future.

Conclusion

In modern world of digitization, everyone needs everything to give brisk and most precise results. From the studies discussed above, size and proportion can be used as an indispensable and individual component in examining the questioned samples. The technique is capable of analyzing the samples both with disguised as well as forged writings and thereby maintaining the integrity of the forensic samples. The simplification of identification through a range of natural variations in size and proportion of letters allow the easy determination of the writer’s identity. However,

sensitivity due to very narrow difference in the proportion of letters and due to their relative size can be very well addressed by combining the two techniques namely “proportion of letters in relation to natural variations” and “relative size of letters in relation to natural variations”.

What is already known on the topic?

This study reveals the role of natural variation in handwriting analysis .

What this study adds?

The study focuses on the examination of natural variations in handwritings in the context of size and proportion of letters. The study has not been done yet , discussing about the role of size and proportion in analysis of handwriting.

Suggestions for further development

The study will enlighten the minds of handwriting experts to analyse samples with an ease and with more accuracy.

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