

Study on Blot Mark Frequency in Normal and Disguised Writing with Respect to Use of Fountain Ink Pen in Different Paper Gsm



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Abstract

Blot marks occur as a result of one's writing and can be stated as a feature of disguised writing. It is the act of excessive ink that is absorbed by the paper due to a pen stop or pause and also due to the thickness of paper. The aim of the study is to ascertain the blot mark frequency, and its variation in different paper GSMs, with respect to a fountain ink pen. Samples of 30 were chosen through purposive sampling method and the six samples were taken from each subject (3 standard and 3 disguised on 3 different paper GSMs). The analysis was carried out by comparing specimen (natural handwriting) with the disguised samples. Magnifying lens (6.5x) and stereomicroscope were used to analyse the samples. From the study, it was observed that in natural handwriting, the blot marks were appeared to be less in number than that of disguised handwriting.

Keywords: Disguised Writing; Blot Mark Frequency; Paper GSM

Introduction

From the time humans started communicating, many substances were used as writing surface such as rocks, clay and substances found in nature. Papyrus, bamboo, hemp, cotton, linen etc. were used as writing materials by Chinese, Arabs and Egyptians. Later, paper manufacturing has become a scientific process that employs highly sophisticated equipment in manufacturing varieties (style, color and weight) of papers with varying qualities. Newsprint paper, bond paper, light weight uncoated papers, carbonless papers, gummed papers, text papers, coated papers, safety papers etc. are available for various purpose for documentation [1]. The different properties of paper such as weight, strength, durability, thickness and finish (coated and uncoated) are important contributing factors in examination of disputed documents. Based on these factors, the ink absorbability also varies as different papers have different absorbability based on its texture [1]. The manufacture of ink took unprecedented development during T'ang dynasty (AD 618-906). Large number of ink factories has been established during this time under the supervision of highly trained specialist, Mo We Kwan. Carbon ink was one of the oldest forms of writing ink and referred as Indian ink. It was manufactured from smoke of green pines, where Lampblack were extracted from these pines.

They are insoluble in water and can be removed from paper by abrasion. It became obsolete after the introduction of

Iron-gallotannate inks. Generally, fountain pen inks are of two types- Iron-gallotannate and aqueous solution of synthetic dyes. Iron-gallotannate are iron salts in combination with gallotannic acid in an aqueous colorless solution, when applied to paper, darken quickly after getting oxidized with air. These inks contain synthetic blue dye to provide an immediate blue color to the ink which turns to black after oxidation. These Blue- Black fountain ink pens are very stable (not decomposed by light, air, moisture or micro-organisms) and are absorbed into the fibers of paper. These inks are insoluble in water and cannot be erased by abrasion. On the other hand, the aqueous solution of synthetic dye inks has bright color and produce attractive writing, but not as stable as blue-black inks. The main constituent of these ink includes pigmented dyes such as copper phthalocyanate blue which contribute more permanence to the ink [2].

Disguised writing is the effort made by the writer to exclude his genuine writing characteristics and to adopt voluntary foreign characteristics to hide own personality [3]. Disguised writing contains distinctive elements that distinguish it from normal writing. Therefore, it is likely to be less skillful since there will be a conflict between the natural writing habits and the conscious effort to suppress them. Generally, any disguised writing might include hesitations, variation in slant, grotesque letterforms, overwritten letters and slowly drawn strokes [1].

The purpose of this research was to analyze the frequency of blot marks in normal and disguised writing using different paper GSM, with respect to the use of fountain ink pen. The main focus of the study was to comparatively analyze the blot mark frequency in each admitted sample and infer the extent to which the blot mark frequencies are different with respect to disguised writing and to determine the impact of blot mark frequency on different paper GSM. GSM is an acronym standing for 'Grams per Square Meter'.

Quite simply, it allows print buyers and print suppliers to know exactly about the quality of paper that is being ordered. The higher the GSM number, the heavier the paper. Although any GSM is available, we would most commonly find: 55gsm, 90gsm, 100gsm, 120gsm, 140gsm, 210gsm, 250gsm, 300gsm, 350gsm and 400gsm. This trend holds across flyers, posters, leaflets, booklets, magazines, business cards, invitations, stickers, pretty much any printed product we can think of. Blot mark analysis will help in determining the number of pen stops or pen pauses per sample and help determine it in an objective manner. The increase in frequency of blot marks show hesitations and pen pauses or pen stops during disguised writing or are often found in low skilled writing. Since questioned document examination is often a subjective in nature, using the frequency of blot marks helps determine an objective approach in the court of law. Progressing evidence eventually from corroborative evidence into a more conclusive format.

Methodology

A sample size of 30 was chosen consisting of heterogeneous male and female population through purposive sampling technique. Since, the study is exploratory in nature; pilot study was conducted to test results before the entire research was established. The consent of the subjects was taken before collecting the samples. Standards of 3 admitted writing were collected on a blank 25GSM, 35GSM and 64GSM from each subject. After the collection of standards, 3 samples of disguised writing were collected from each subject on different blank 25GSM, 35GSM and 64GSM paper [4]. Samples were collected from each subject using the same writing material, content and writing instrument (fountain ink pen). The collected samples were analyzed using stereomicroscope and handheld magnifying glass (6.5x).

Results and Discussion

From the research, it was observed that for 25GSM paper, the average frequency of blot marks in normal writing was found to be 72.27 and for disguised writing was 102.90. For 35GSM paper, the average frequency of blot marks in normal writing was found to be 36.30 and for disguised writing was 54.93.

Similarly, for 64GSM, the average frequency of blot marks in normal writing was found to be 15.20 and for disguised writing was 23.67. Hence, it can be inferred that in all three different GSM's of papers, disguised writings were found to have higher frequency of blot marks when compared to normal/admitted writing. This might be due to different characteristics implied to disguised writing, such as, pen pressure, slant, speed, alignment, pen lifts and pen pauses, rhythm, consistency, tremors and line quality. Moreover, it was further observed that as the GSM of the paper progressively increases, the frequency of the blot marks decreases for both normal as well as disguised writing (Table 1) (Figure 1).

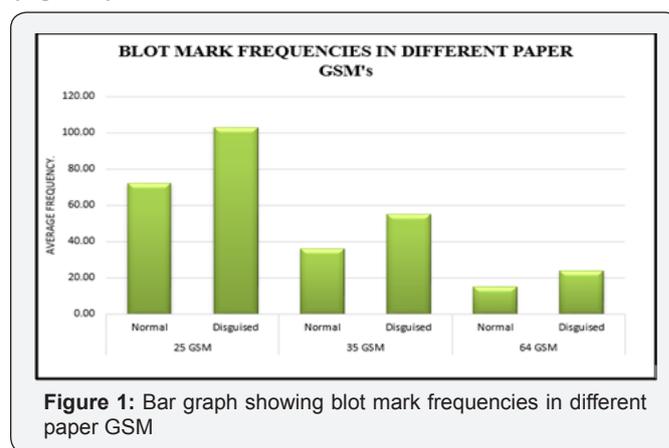


Figure 1: Bar graph showing blot mark frequencies in different paper GSM

Table 1: Showing percentage of Blot Marks in different paper GSM's in Normal and Disguised writing.

| | 25 GSM | 35 GSM | 64 GSM |
|-----------|--------|--------|--------|
| Normal | 72.27 | 36.03 | 15.2 |
| Disguised | 102.9 | 54.93 | 23.67 |

Conclusion

Fountain pen have the peculiar feature of creating blot marks on paper. From this study, it was observed that as the GSM of the paper increases, blot mark frequencies decreases. In addition, it was further noted that in disguised writing samples blot mark frequencies were found to be greater than normal/admitted writing.

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