

The Examination of Disguised Numbers

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ABSTRACT: Numbers in a requested text bear valuable insight into whether the exemplar bears disguised writing. If a writer disguises the writing on a requested exemplar, the numbers are usually written naturally, free of disguise. The paper discusses the methods of disguise used when the writer is asked to disguise the numbers in a requested exemplar.

Two hundred participants completed a four-page exemplar consisting of three pages of naturally executed numbers and one page of disguise. For the disguised exemplar, the participant was requested to disguise the set of numbers to avoid identification.

Results of the 200 participants in this study indicate the use of the alternate number form as the most popular method of disguising numbers. This paper lists the participants' preferences as to the method of disguise employed and to the choice of alternate number form used.

KEYWORDS: forensic science, questioned document, alternate number form, disguise, numbers

Handwriting identification is based on the premise that every writer has a combination of writing habits that are unique to that individual. Will a set of numbers, such as a telephone number or a dollar amount, reflect the writer's unconscious combination of habits needed for an identification or elimination? If the writer attempts to disguise the exemplar, what methods are most commonly employed? What should an examiner look for to determine whether or not the writer attempted to disguise the numbers?

To answer the above questions, the author examined known number exemplars of 200 participants. The participants reside throughout the United States and are between the ages of 16 and 81, with an average education level of four years of college.

The participants were asked to complete a four-page exemplar in black ballpoint pen. The first three pages contain several telephone numbers and various numerical dollar amounts. The fourth page instructed the participant to alter or disguise the set of numbers to avoid identification. The writer was instructed not to change to the off-hand or change writing instruments.

Naturally Written Numbers

Numbers tend to be individualized to a particular writer as they depart from the copybook style. The three basic habits used to identify numbers are form, writing quality, and variation. These habits include both the basic design and the subfactors of design, i.e., initial and ending strokes, ornamentation, design simplification, overall slant, and the inter-relationship of component parts in the more

complex digits "2," "3," "4," "6," "8," and "9" (1). In addition, size, space, baseline alignment and positioning of multiple numbers bear the combination of characteristics that are identifiable to one writer.

When examining numbers, it is beneficial to obtain lengthy exemplars that reflect the writer's range of variation and whether more than one form of a number is used by that writer. Through her research of one hundred participants, Giles found over 40% of individuals used two or more forms of the "6," "2," and "9" (2). More specifically, 48% used two forms of the "6," 55% used two forms of the "2" and 43% used two forms of the "9." Out of 200 participants in this research, 46% used two forms of the "2," 38% used two forms of the "9" and 32% used two forms of the "7." The most likely figures reflecting a third form were the "2," "7," and "5."

Methods of Disguise

A writer attempting to disguise the requested exemplar tends to overlook the numbers. Hesitation, tremor, poor line quality, and lack of varying pen pressure are classic disguise characteristics found in the disguised writing. Disguised numbers bear the same characteristics as the writer has to rely upon memory when making a different number form when deviating from the natural writing. There are some limitations to the type of disguise characteristics that can be used since numbers tend to be more limited in text. The method and characteristics of disguise present in the research exemplars include the following listed in order of preference:

1. Use of alternate number forms. The five most likely figures to bear alternate number forms were the "2," "4," "8," "7," and "9." When the alternate form is used, there will be tremor, lack of varying pen pressure, and slowness in formation of the number.
2. Increased size of the numbers. Evidence of increased size includes awkward number formation, slow execution, no varying pen pressure, and some tremor.
3. "Formal" version of the writer's carelessly written natural number. The only evidence apparent to the examiner will be neatness of the writing. Tremor and awkwardness will not be present.
4. Change of slant. Inconsistency in slant throughout the exemplar, slow execution, and angular formation are evidence of a writer attempting to change the slant.
5. Change of pen direction in number formation. For example, some writers reversed the initial stroke of the number "8." Evidence of hesitation of the initial stroke, some tremor, and slower execution will be present.

Inconsistency was present in all the disguised exemplars. Tremor and inconsistency was most prevalent at the beginning of the exemplar. As the participant completed the exemplar, the writer was able to execute the alternate number form and/or change the slant with increased speed and consistency toward the end of the exemplar. It was also noted that as the speed of execution increased in formation of the disguised number, the occurrence of the writer's natural number forms increased.

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TABLE 1—Percentage of participants using alternate number form and the listing of the most popular formation.

Number	Percentage	Alternate Formation
1	20	Addition of base and/or serif.
2	62	Addition of loops if not present in natural "2"; elimination of loops if present in natural "2." Formation of "2" with square bottom staff.
3	34	Angular bowl formation. Addition of loops to lower bowl.
4	54	Tent-shaped body.
5	33	Single stroke "5" used in disguise if two stroke used in natural; two stroke "5" used in disguise if natural "5" was a single stroke.
6	24	Increasing or decreasing bowl size. Change in staff curvature.
7	58	Crossbar used in 1/3 of disguised "7"s.
8	60	97 of 120 disguising the "8" used the "snowball" style of "8." The "s" style "8" was used in the disguise if the "snowball 8" used in the natural.
9	45	40 of the 90 participants used a one-piece "9" that resembles the shape of a walking-cane. 40 of the participants used a two-piece "9."
0	15	Change in pen direction. Example, from counter-clockwise to clockwise.
\$	25	Used opposite of natural "\$," i.e., single staff through "S" body instead of two staffs.

Some writers are better at disguise than others. In the extended text, most writers used several alternate number forms (Table 1). Of the 200 participants, 171 writers disguised at least three numbers by using an alternate number form. As with the naturally written numbers, a few of the participants used more than one form of

a number. Twenty-five participants used two forms of their disguised "2," 12 used two forms of their disguised "4," and 11 used two forms of their disguised "7."

Dollar amount format was changed to an alternate form in 30% of the disguised exemplars. The placement of the decimal point and the dash placement in the telephone series remained the same in the disguised exemplars. As a general rule, spacing between a series of numbers was not affected except when the participant greatly increased the size of the disguised numbers. Height ratios remained relatively constant in both the natural and disguised exemplars.

Conclusion

Disguised numbers offer a unique challenge to the document examiner. The more common characteristics of disguise such as inconsistency, tremor, awkwardness, lack of varying pen pressure, and hesitation are most prevalent at the beginning of the requested exemplar. The fluency of the disguise improved toward the end of the exemplar.

The most popular method of disguise to avoid identification is the use of several, if not all, of the alternate number forms. With an alternate number form, the examiner lacks comparable exemplars for examination. However, this method usually bears classic characteristics associated with disguise.

References

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