

Figuring It Out

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Identifying records of drug dealing transactions inevitably leads to the examination of scraps of paper bearing only figures. In order to assess how variable individuals are when writing figures, a number of writings were classified and the number of variations assessed. Some figures, for example, the figure 4, proved to be a better indication of authorship than others.

Introduction

The Forensic Document Examiner (FDE) frequently examines documents involved in drug prosecution cases. The evidence often consists of handwritten notes seized from the defendant's address, which indicate the records of drug deals. Normally these are small scraps of paper bearing cryptic lists written almost entirely in figures.

The defendant naturally claims that the note has never been seen before and certainly the defendant did not write the notes! The very restricted amount of comparable material on these notes inevitably leads to a qualified conclusion regarding the authorship of the handwriting when the limited amount of writing is available. This study was carried out to determine the degree of variability that may be observed in handwritten figures of a single individual.

Methods and Materials

A preliminary survey was carried out on approximately a hundred samples of handwriting. These samples were obtained from friends, colleagues and visitors to the Laboratory. The individuals were adults of reasonable educational background.

The volunteer writers were asked to provide five sets of figures. Where practical, volunteers were re-visited at a later date and requested to provide a further set of samples. A data sheet was prepared for each of the figures and the number of different occurrences logged.

A classification was designed to incorporate all the forms of the figures that were observed in these samples. This classification scheme allowed a review of the frequency of different forms. A review of the samples indicated the variability of writings, for example, how many different forms appeared in a person's handwriting (Chart 1).

	1	2	3	4	5	6	7	8	9	0
a	1	2	3	4	5	6	7	8	9	0
b	11	2	3	44	55	6	7	8	9	0
c	11	2	3	4	5	6	7	8	9	0
d		2	3	4	55		7	8	9	0
e		2	3	4	5		7	88	9	0
f		2	33	4	5		7			
g		2								
h		2								

Chart 1. Different forms of numerals.

Results

The results of the analysis of the variability of writings showed that although a significant number of individuals used two forms of figures, only a very small number used three or more forms (Table 1).

Analysis demonstrates that figures 1 and 7 showed the least variability, with over 90% of individuals using only a single form. Over 40% of individuals used combinations of two forms of figures 2, 6 and 9, whilst 20-30% of the individuals used two forms of the figures 5 and 0.

The use of three different forms only appeared in a handful of individuals with figures 5 and 6 showing the greatest variability in a single person's handwriting.

Table 2 shows the number of different combinations found in the writings, such as the forms a+b, b+c and so forth.

Figures 1 and 9 showed the least number of combinations whereas figures 2, 3, 4 and 5 showed the greatest number of different combinations. In cases where three forms of a figure were found in

one person's handwriting, the same combination was generally found on each occasion. Two different combinations (a+b+c and a+b+d) of the figure 8 were found.

Discussion

Of the ten figures, only 1 and 7 showed strong consistency within one person's handwriting with relatively few individuals using a second form. It was interesting to note that the samples could be divided approximately in half using just the two forms of crossed and uncrossed 7. Such a low level of individuals combining these two forms (less than 2%) suggests that this is a useful indicator of the number of writers involved.

For all other figures there was a significant number of individuals who used two or more different forms of a figure, with the figures 2, 6 and 9 having the highest chance of varying. In the case of the figure 2, this may well be the result of the large range in variation found in the figure form throughout the writings. In the case of the figure 9, the biggest segregation was found between the

Numerals	Total Individuals	% Individuals Using Only a Single Form	% Individuals Using Only Two Forms	% Individuals Using Three or More Forms
1	110	92%	8%	0%
2	111	55%	40%	0%
3	111	85%	14%	1%
4	111	85%	14%	1%
5	110	68%	29%	3%
6	111	46%	48%	6%
7	111	96%	4%	0%
8	108	85%	13%	2%
9	110	56%	43%	1%
0	111	67%	32%	1%

Table 1. The percentage of individuals using one, two, or three or more figure forms in the sample.

Numeral	Number of Different Combinations of Two Forms	Number of Different Combinations of Three+ Forms
1	1	0
2	6	1
3	5	1
4	5	1
5	6	1
6	3	1
7	2	0
8	4	2
9	1	1
0	3	1

Table 2. Different combinations of figures found in writings.

open and closed form and this is where the greatest number of combinations also occurred. Clearly this is not a reliable indicator of the number of writers.

The unreliability of the figure 6 probably results from the extreme simplicity of this figure. In general, differences between figure 6 arise as a result of shape rather than basic construction.

In the case of figures 3, 4 and 8 less than 15% of individuals use more than one form. Figures 4 and 8 are generally particularly useful in identifying handwritings since the different forms are so distinctive. However, the fact that a significant number of individuals use combinations of forms means that caution needs to be exercised in reaching conclusions based on these figures.

Conclusions

Forensic Document Examiners are often called upon to perform miracles with inadequate quantities of handwritings! In the case of drug deal-

ings, lists of numerals often need to be identified. This pilot project indicates that few figures are reliable in determining if one or more writers are involved since a significant proportion of individuals use two forms of a given figure. Very few individuals, however, use three forms and none was found to use more than three forms. FDE's must continue to use caution when dealing with such restricted quantities of writings. Further research should be directed to the significance of the different combinations observed.