

UDC 343.98

DOI 10.31733/2078-3566-2021-5-195-200



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### **STUDY OF MANUSCRIPTS MADE WITH THE CHANGE OF HABITUAL WRITING HAND**

**Abstract.** The scientific article considers the features of expert research of manuscripts made by hand unusual for writing, namely left-handed writing. Attention is drawn to the stages of research of these manuscripts, the factors influencing the change of handwriting. Based on the scientific achievements of prominent handwriting experts and the results of generalizing the conclusions of forensic experts, where the objects of the study are left-handed manuscripts, an attempt was made to distinguish a set of qualifying features of handwriting and signatures. Emphasis is placed on the need to conduct a comparative study with left-handed manuscripts made by his right hand to establish the level of mastery of right-hand writing skills, which makes it possible to assess the differences.

**Key words:** handwriting examination, change of habitual writing hand, left-handed writing, diagnostic tasks, research of manuscripts.

**Relevance of the study.** In criminal and civil proceedings, where the main evidence is documents, there is usually a need to appoint forensic examinations, including handwriting, where diagnostic tasks are often crucial. According to the Methodology, diagnostic research in handwriting includes the establishment of external circumstances and conditions of execution of the manuscript (signature) and the establishment of the internal state of the performer [5, p.5]. During the expert research, features are established that are absent when solving identification issues. Thus, for an expert it is extremely important to establish the factors that affect the violation of the writing process, to conduct research in the presence of certain samples or in their absence, and so on. The typical questions posed to the expert relate to the influence of "confusing" factors during the execution of the manuscript, the unusual condition of the writer, the execution of the manuscript intentionally changed handwriting. One of the types of intentional change by the executor of his handwriting is the execution of a handwritten text (records, signatures) with an unusual left hand for writing.

A change in handwriting, whether intentional or not, is always associated with a change in a person's writing skills. Writing is usually associated with the de-automation of a writer's writing skills. Depending on the factors that affect the change of handwriting (conscious distortion of one's handwriting, imitation of another's handwriting, etc.), writing skills change to a greater or lesser extent. The degree of distortion of signs thus depends both on stability and variability of a handwriting of the executor, and on character of the conditions influencing change of skill. However, the records usually remain unchanged, as a complete restructuring of the stereotypical system of movements usually does not occur.

**Recent publications review.** Issues concerning the appointment and conduct of handwriting experts have been repeatedly covered in the scientific works of criminologists, namely: L. Arockera, R. Belkina, A. Winberg, W. Goncharenko, Z. Kirsanova, N. Klimenko,

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A. Kolonutova, A. Kupriyanova, V. Lipovsky, V. Lisichenko, A. Mantsvetova, A. Melnikova, Z. Milenevskaya, A. Moiseeva, V. Orlova, M. Saltevsy, N. Sakharov, M. Sega, I. Friedman, O. Shlyakhova, C. Tsipenyuk and others. Problems of forensic examination as one of the forms of using special knowledge in doctoral dissertations O. Moiseeva, I. Petrova, I. Piroga, M. Shcherbakovsky, E. Simakova-Efremyan, S. Evdokimenko. Undoubtedly, these scientists have made a significant contribution to the scientific development and methodology of handwriting examination. But in our practice about the complex process of diagnosis, which is often investigated by the results of the impossibility of its formation in a form that requires additional coverage in scientific papers

**The article's objective** is to establish and evaluate a set of features that are manifested in the process of changing the usual writing hand, in particular, in left-handed writing.

**Discussion.** As you know, the study of the manuscript, made by the left hand, is carried out in two stages:

- establishing the very fact of unusual writing with the left hand;
- identification of the person by the unusual handwriting of the left hand [3, p. 154].

Establishing the fact of execution of the manuscript with the left hand depends on the degree of mastery of the performer's writing and moving skills of writing with the left hand. Individuals who have developed, identical in general handwriting, have different ability to write with the left hand.

Depending on the ability of the manuscript to write with the left hand, the performers can be divided into the following groups:

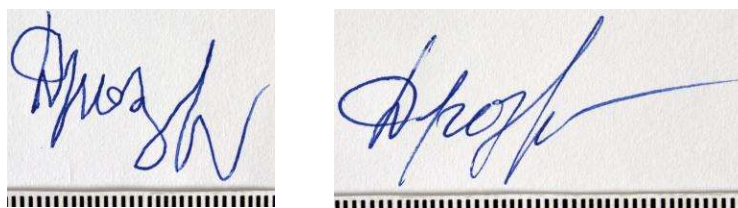
1) persons in whose left-hand writing there is a relatively fast pace of writing, relatively high coordination of movements, but always lower than in ordinary writing, as well as the most complete reproduction of the handwriting of the right hand;

2) persons in whose left handwriting the pace of writing and coordination of movements is much lower, and the reproduction of the handwriting of the right hand is less complete;

3) persons in whose manuscripts the pace of writing and coordination of movements is much lower, and the reproduction of the handwriting of the right hand is less complete [7, p. 141].

If the writer does not have the skill to perform manuscripts with a change of the usual writing hand, the expert can easily establish the fact of execution of manuscripts with an unusual (left) hand. This is indicated by certain features that will be observed throughout the manuscript.

The process of writing with a change of the usual writing hand is usually characterized by controlled movements of the performer, devoid of automation. To perform recordings with the left hand, a person has to independently form the mobile skills of such writing, ie to establish a new version of his handwriting.



**Fig. 1.** Signatures performed with an unusual left hand (left); the usual right hand (right)

*Source: presented by author.*

When writing with an unusual (left) hand, there is a significant change in all the general features: development, coordination of movements, pace, shape, size, acceleration, placement, tilt, coherence, pressure (Fig. 1). As a rule, they become unstable. The practice of studying expert opinions shows that the change of such features as inclination, size, acceleration, coherence of written signs is performed in all performers relatively uniformly. The general features of written signs change similarly.

Scientists have previously identified specific features of left-handed writing: incoordination of movements, manifested in oval and connecting elements of letters; slow pace of writing; mirroring (direction opposite to the given), expressed in the curvature of the elements both in letters and in their elements; increasing the length of movements horizontally

when performing the final parts of the elements of the letters; letter structure (simplified, in the form of block letters); type of letter combination - absent or attached; tortuous line shape, etc. [1, p. 150]. However, in the conditions of rapid distribution of electronic documents, against the background of the general decrease in the degree of handwriting of citizens, we observe the above signs most pronounced.

Manuscripts in unusual handwriting look reminiscent of manuscripts made in the underdeveloped handwriting of the right hand or deliberately reduced in its production, as well as in ataxic handwriting, ie handwriting that has undergone age-related changes (old age and age) or painful changes. When studying manuscripts made with an unusual left hand, scholars rightly suggest that, unlike them:

- in poorly developed handwriting there are no excessive curvatures and angularity of strokes or they are absent at all. Along with letters of simple structure, letters that have a complex structure are combined in a simplified or fancy way;

- in handwriting, performed in violation of coordination of movements, there is no "mirror", a relatively stable combination of letters can be traced throughout the text;

- in handwriting changed in another way, ie when intentionally changing handwriting (cursive masking of his handwriting; imitation of printed font; imitation of another person's handwriting) the execution of the text by produced and automated movements is observed [8, p.81].

To establish the fact of execution of records or signatures with an unusual (left) hand, it is necessary to establish a set of features that characterize the handwriting of an unusual letter of the left hand. During the preliminary study of manuscripts made in unusual conditions, the task of the expert is to separate the handwriting features that characterize the handwriting of unusual writing with the left hand, from the features of underdeveloped handwriting and handwriting of the elderly, the sick, and from the signs the result of a deliberate reduction in the degree of handwriting.

The left handwriting becomes more vertical than the normal handwriting of the right hand (Fig. 2):

- uneven arrangement and acceleration of written signs and their placement relative to each other (placement at close distance to each other, reducing the length horizontally, arrangement - narrow or long distance, increasing the length horizontally, arrangement - wide), acceleration - from large to medium or small;

- reduction and unevenness of connectivity, continuous connection of elements of many elements of written signs is replaced by adjacent connection. The vast majority of letters or their elements are performed without connection with the previous and subsequent ones, but with a general low degree of connection of written characters there are words or part of words (3 or more characters, in some words 4-9 letters can be connected) performed with continuous movements;

- tortuosity of the line shape in the manuscript, most lines in the manuscript acquire a wavy, uneven shape;

- change in the structure of movements, their complete deformation occurs, and the connecting strokes change. New variants of letters appear, mainly in block letters or close to spellings, as well as due to the complication or simplification of variants, the letters "g" and "h" are made in the form of the Latin letter "z", the dot is made in the form of a comma;

- changing the width of the main and connecting strokes by increasing the pressure. When writing with the left hand, the pressure on the writing instrument increases, which increases the width of the strokes of the written characters. The width of the main and connecting strokes of almost all characters, as a rule, becomes the same;

- the pace of writing slows down, but the pace of individual elements or parts of them can remain fast [4].

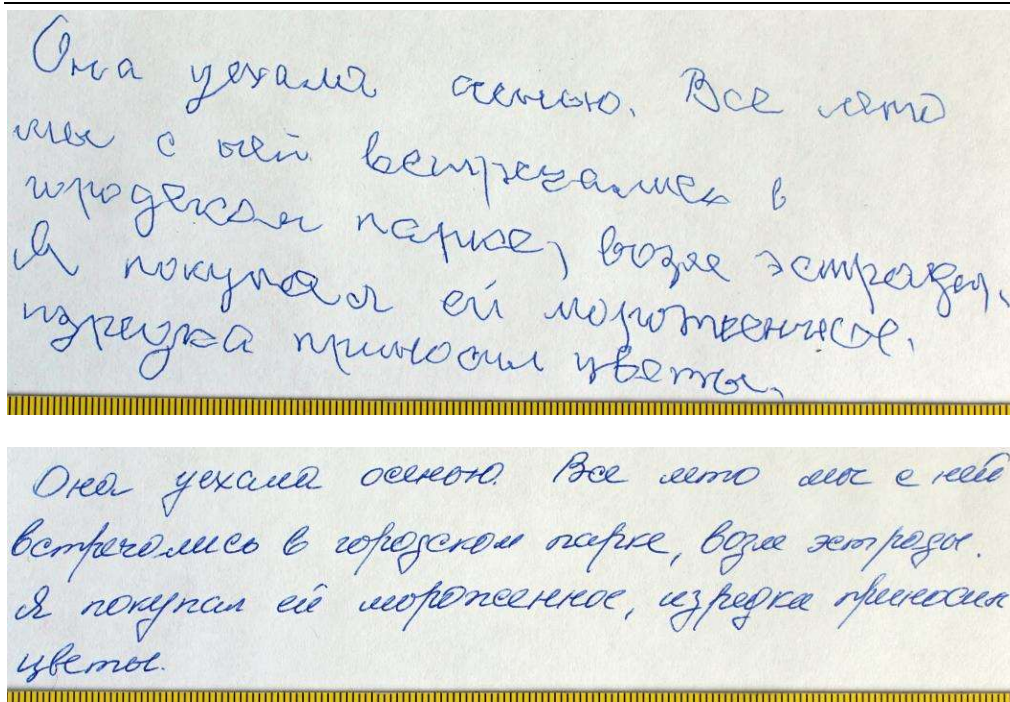


Fig. 2. Fragment of left-handed writing (top) and right-handed writing (bottom)

Source: presented by author.

Some features of handwritten notes (texts or signatures) made by the left hand indicate the presence of certain features peculiar only to such writing. Analyzing the expert opinions and scientific literature, we found that when changing the handwriting in the manuscripts, both variants of the written characters of the usual handwriting are preserved, and new variants appear, which are more close in configuration to the typical prescriptions. Graphic writing of written signs and their mutual arrangement undergo significant changes. Multi-element letters are made in a simplified version, in some cases there are variants of new letters, made in imitation of block letters ("a", "b", "t", "n", "n", "i", "x", etc.) .

The shape of movements when performing initial and final parts of letters in the form of ovals, semi-shafts, loops, triangles, ellipses due to a change in direction of movement, which is caused by lack of left-hand writing skills, becomes broken or tortuous, while maintaining the basic general shape.

The direction of movements in the execution of written signs and their elements, mainly does not change in the oval, semi-oval and loop elements of the letters. However, some parts of the elements are performed in the opposite direction from the specified (mirror), ie changes in the direction of movement, which can be performed completely or partially mirror. With careful execution, the performer monitors the execution of written signs, the mirror is almost absent and, conversely, with the weakening of visual control, with careless execution of the mirror increases.

The type of connection of written signs and elements of unusual left-handed writing with continuous movement during the execution of letters and their elements is manifested in separate intermittent movements.

The location of the movements and their length when performing the initial and final elements changes and, accordingly, the location of the start and end points of the movements relative to the line changes. The location of the start and end points of movements when performing letters and elements remains relatively constant, except for those elements that are partially or completely mirrored. If there are changes in this feature, it is most often manifested in the relative position of the beginning and end of the movements relative to the line. Execution of oval or arc elements of letters (in the absence of specularity), in the left-hand letter almost does not change. On the contrary, there is a significant change in the location of the junction of movements when writing characters and elements when changing the writing hand relative to the line of the line (except for oval elements), which is associated with the size of strokes [1, 4, 7].

After establishing a set of features, the expert must assess and reach a certain conclusion. In previous scientific papers, we wrote that in each case, the expert evaluates the amount and design of graphic material with which he works. The conclusion is formed on the

basis of a set of established stable individual characteristics that coincide or differ, sufficient for a particular inference, and not in view of the obviousness of the characteristics. It is impossible to predict in advance what the conclusion will be when examining signatures, depending on the method of forgery (imitating the signature of another person, on behalf of a fictitious person, memory performance, etc.). Taking into account all these factors, the conclusion can be both categorical (positive or negative) and probable, or even exclude the possibility of identification [2, p. 95].

However, it should be noted that with an average degree of mastery of the writing-moving skill of writing with the left hand in the manuscript, along with the general incoordination, there are elements of automation of movements. Mirroring will be much less common, so the question of the performer of the manuscript with the left hand is decided not at the stage of separate research, but at the stage of comparative research. Signs of ordinary handwriting are established, as well as their stability, as the manuscript has a large number of unchanged features of handwriting, starting with the general and individual features of ordinary handwriting.

For a high degree of development of left-handed writing skills are characterized by automated movements, fast writing topics. Usually the executors of such manuscripts are left-handers, people who lost their right hand and later learned to write with their left hand, as well as people who can write freely with both their right and left hand (ambidexters). In such cases, establishing the fact of execution of the manuscript with the left hand is impossible due to the lack of signs of left-handed writing. The fact of execution of the manuscript with the left hand is known from the materials of the criminal proceedings. Therefore, in this case, the question is only about the identification of the executor of the manuscript, bypassing the solution of diagnostic tasks.

In this situation, it is necessary to conduct a comparative study with the manuscripts of the left-handed man, made by his right hand, to establish how many left-handed people have the skills of writing the right hand. This makes it possible to assess the differences, because in the handwriting of a person who can write with the right and left hand, in manuscripts made by one hand, there are signs that are absent in the texts made by the other hand.

**Conclusions.** Based on the scientific research of scientists, based on the analysis of expert practice, an attempt was made to identify a set of features inherent in left-handed writing, among which we identified: mirror, distortion and angularity in the strokes of written signs, simplified and complicated version), lack of connection between letters and letter elements, etc. In today's conditions, against the background of a general decline in writing and moving skills of citizens, the established features are more pronounced, which allows to establish the fact of execution of the manuscript with a change of the usual writing hand and identify the performer.

*Conflict of Interest and other Ethics Statements*

The authors declare no conflict of interest.

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Submitted: 01.12.2021

**Ганна БІДНЯК, Любов СОКОЛЕНКО  
ДОСЛІДЖЕННЯ РУКОПИСІВ, ВИКОНАНИХ  
З ПЕРЕМІНОЮ ЗВИЧНОЇ ПИШУЧОЇ РУКИ**

В науковій статті розглянуто особливості експертного дослідження рукописів, виконаних незвичною для письма рукою, а саме ліворучне письмо. Привернуто увагу до етапів дослідження зазначених рукописів, факторів, які впливають на зміну почерку. Ґрунтуючись на наукових досягненнях видатних почеркознавців та результатах узагальнення висновків судових експертів, де об'єктами дослідження виступають ліворучні рукописи, зроблена спроба виокремити комплекс кваліфікуючих ознак почерку та підписів, за якими розрізняється письмо з переміною звичної пишучої руки.

На фоні загального зниження письмово-рухомої навички громадян, встановлені ознаки проявляються в рукописах різного ступеня виробленості. Зазначене дозволяє встановити факт виконання рукопису з переміною звичної пишучої руки та ідентифікувати особу виконавця на певних стадіях експертного дослідження (роздільній або порівняльній). При середньому ступеню володіння письмово-рухомою навичкою письма лівою рукою в рукописі, поруч із загальною некоординованістю, виокремлені елементи автоматизованості рухів, набагато рідше дзеркальність. Для високого ступеню розвитку навички письма лівою рукою зазначено також швидкий темп письма. Акцентовано на поділі ознак почерку та відмінностях тих, що характеризують почерк незвичної лівої руки, від тих, що притаманні маловиробленому почерку і почеркам осіб похилого, старечого віку, хворим особам. Для підтвердження наведених ознак були використані приклади з експертної практики.

Акцентовано на необхідності проведення порівняльного дослідження з рукописами лівши, виконаними ним правою рукою, для встановлення рівня володіння навичками письма правої руки, що дає можливість оцінити розбіжні ознаки.

**Ключові слова:** *почеркознавча експертиза, зміна звичної пишучої руки, ліворучне письмо, діагностичні завдання, дослідження рукописів.*

UDC 343.1

DOI 10.31733/2078-3566-2021-5-200-205



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**WAYS TO IMPROVE THE INTERACTION OF INVESTIGATORS WITH  
CRIMINAL INVESTIGATION UNITS AT THE PRE-TRIAL INVESTIGATION**

**Abstract.** It is almost impossible hold rapid and effective investigation of criminal offenses in some cases without the help of criminal investigation units. Currently, the state of interaction of the investigator with the criminal investigation units continues to remain low in terms of combating criminal offenses. That is why it is so necessary to study this problem and find ways to improve the interaction of investigators with criminal investigation units at the pre-trial investigation.

As a result of the study the authors formulated a set of proposals for making changes and additions to the CPC of Ukraine.

**Keywords:** *criminal investigation units, interaction, pre-trial proceedings, investigator, criminal offense, investigation, criminal proceedings.*

**Relevance of the study.** In recent years in Ukraine crime in general is steadily increasing and a significant number of crimes, including serious and especially serious, remain unsolved. At the present stage, the fight against crime requires not only the maximum use of all

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