

FORENSIC HANDWRITING EXAMINATION OF PAINTER SIGNATURES FOR FAMILY SIMILARITIES BETWEEN GRAPHISMS IN CASE OF DIRECT LINE RELATIVES (BASED ON THE EXAMPLE OF SIGNATURES OF JACEK AND RAFAŁ MALCZEWSKI)*

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Abstract. This study is a part of a publication cycle on the similarity of graphisms in painter signatures. In the examination of handwriting, one of the identification problems, raised in expert opinion practice and in literature of the subject, are family similarities of graphisms. Even a well-qualified expert encounters serious identification problems, especially when analysing similarities between graphisms in isolated conditions. The same problem arises also in the context of painter signatures. Situations are known when works are signed by the artist's family members. As a result, an attempt is made to compile a catalogue of features identical for family members and to confirm the legitimacy of research on family similarities between painters. The study focuses on family similarities in signatures of painters related in the direct line (father and son), following the example of graphisms by Jacek and Rafał Malczewski.

Keywords: handwriting analysis; painters' signatures; familial similarities of graphisms; expert's opinion.

INTRODUCTION

An artistic signature is a sign personalising the artist and a source of primary information about the artist. Therefore, it is an objective criterion enabling the object's attribution. It is often approached as an integral part of the work of art on which it is put, which is incorrect. There are also situations of false signatures added to authentic works of art. One of such examples was provided by Franz Lenbach's wife, who would steal her husband's sketches from his studio, sign them in lieu of the author and sell as finished works. Also a reverse situation is possible – placement of an authentic

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signature on a forged painting. Salvador Dali and Marc Chagall would sign in blank lots of empty sheets of paper on which reproductions were then printed of different works. In such situation, market and collector's value attaches only to the artist's signature. On the other hand, Jacek Malczewski, who was not the author of the painting submitted to the artist for signature, agreed to sign it driven by compassion to the work's poor owner who hoped to improve her financial standing after selling the painting. Also situations of so called benevolent signatures cannot be forgotten – put by artists whose name had a higher market value on works of their less known but equally apt colleagues (such practice was engaged in, e.g., by Camille Corot). All those examples prove that any findings as to the authenticity of the signature cannot be decisive when it comes to the authenticity of the signature's carrier, namely the painting. As a consequence, a signature should be approached as an added element that can easily have an independent existence.

This study is the first publication in a cycle on the similarity of graphisms in painter signatures. Its purpose is to make an attempt at compiling a catalogue of identical features for family members and to confirm the legitimacy of conducting research on family similarities among painters. In a broader perspective, the results of the research may contribute to increasing the reliability of an expert's work and eliminating errors consisting in the attribution of the questioned signature to a wrong person. In the study, the focus has been placed on family similarities when it comes to signatures of painters being lineal blood relatives. Further research, as a part of the planned project, will be expanded to other family relations, i.e. collateral blood relationship (e.g., brother – brother) and affinity by marriage (e.g., husband – wife), and to environmental similarities.

Signatures have been examined of Jacek and Rafał Malczewski, father and son, both painters. They were chosen for a couple of reasons. In the inventories of Polish museums, there are a lot of their works whose attribution does not raise any doubts. Both of them signed their paintings using full signature, which is important in the context of analysis of the signature's characteristics (the greater the lettered content of an analysed graphism, the more features can be assessed). Moreover, at different stages of their life, their relationship was getting closer (e.g., when Jacek wanted to raise his son's interest in painting), or looser (due to frequent travels of the father abroad), which may be a valuable contribution to the discussion about the level of imitation by children of their parents' handwriting. The choice of the Malczewski family was also affected by the continuous popularity of Jacek's paintings and much interest in the collector market, which is demonstrated by very high (often also record) prices of auctioned works [Łozińska 2022]. Moreover, his works are discovered which have been considered forgotten, lost, but also completely unknown [Markowski 2002, 7]. In the light of the above, it is no surprise that he is also one of the most frequently forged Polish artists.

1. MATERIAL AND METHODS

1.1. Jacek and Rafał Malczewski – the artistic context

At the beginning, life of both artists should be discussed in the context of mutual interplay of their artistic output. Jacek Malczewski (1854-1929), painter and draftsman in the Young Poland period, is considered by art historians one of the most prominent Polish artists and the father of symbolism, a movement in Polish painting in the late nineteenth end early twentieth century [Maurin-Białostocka, et al. 1971, 275-84]. In his work, the ideas were manifest of patriotism, martyrdom, national messianism, sensitivity to the beauty of native landscapes and the native folklore, which were articulated in thematic series appropriately developed and transformed by the artist. Malczewski's paintings contain profound philosophical and psychological contents, reflect the Polish reality, which, intermingled with the realm of tales and myths, assumes a new meaning. This creative work touches upon the most essential human topics, such as: death, patriotism, religion or freedom.

Rafał Malczewski (1892-1965) is referred to as poet-painter. At an early stage of his work, the influence of his father is apparent. At a later stage – cubism and futurism, one can trace the influence of landscapes by Egon Schiele and Ferdinanda Hodler [ibid., 284-87]. At that time, the son's expressionist works characterised by sharp contrasts between clean colours begin to affect the output of the father, who tries to understand modernist painting and creates modernist landscapes. The works of Malczewski the son are characterised by literary contexts, poetic imagery and metaphor. "For interwar critics, he was a prime example of an artist who did not follow the footsteps of his famous father but chose his own, completely different path" [Policht 2023].

Jacek Malczewski portrayed Rafał at every stage of his life. He also tried to instil in his son a penchant for observing nature and capturing it on paper. Around 1900, a painting dialogue started between the father and the son [Folga-Januszevska 2006, 10], however, the bond became stronger only fifteen years later when Jacek, after the war broke out, was forced to move to Vienna, where Rafał had already studied for some time. Although at the initial stage of Rafał's creative work, subtle interplay is apparent with Jacek's artistic output, the younger Malczewski was anything but direct continuator of his father's art [Policht 2023]. Although both painted the same motifs, they approached the subject matter differently – Rafał would depict the motifs in a slightly humorous way, as external observation, and showing relativism as opposed to the father's seriousness and symbolism. An important element of their artistic work were their mutual portraits. "The bond between the father and the son became stronger especially in the last twenty

years of Jacek's life" [Szymalak-Bugajska and Nowoska 2022, 288]. Their relationship was an intergenerational creative dialogue [Paprotna 2019, 123].

1.2. Forensic handwriting examination of painters signatures

As a field subsidiary of criminal law and the basis of identification methods, forensic science aims to gather identification material. It is used for crime detection and perpetrator identification, which is the main aim of criminal procedure. Although criminal procedure is a primary interest of forensic sciences, its methods are used in the rest of the fields of law. It is used where it is necessary to identify a person or an object based on a trace left by any of them [Widacki 2018, 3]. It is why forensic science is also used in archaeology, museology, and history. An artwork's authentication and attribution process is where forensic scientists are present for a long time. They can offer laboratory equipment and scientific knowledge on, for example, forensic handwriting examinations carried out by graphic-comparative method. They give an expert opinion in courts or for public institutions like museums; they are members of teams carrying out scientific research on artworks.

As mentioned, one of the elements of an artwork analyzed by forensic scientists is the painter's signature. Examination of an artistic signature's authenticity is performed by the comparative graphical method used in handwriting research, appropriately adapted taking into account the specificity of the analysed objects. In the context of signatures placed on works of art., appropriate modifications are introduced to the method following from the specificity of the examined objects. This relates to external factors that can affect graphisms, i.e. non-standard writing tools, e.g., brush (as opposed to standard instruments, i.e. a pen or pencil); covering agents (paints), non-specific background surface (canvas or desk) or writing position.

In the analysis of handwriting, one of identification problems raised in expert opinion practice and in literature of the subject are family similarities of graphisms. It happens that persons duplicate, in their handwriting, certain characteristic features of handwriting of other family members. This, in particular, refers to children, who follow the handwriting style of their relatives, most often parents, with whose handwriting they have to do most frequently [Koppenhaver 2007, 13]. Even a well-qualified expert comes across serious identification problems, especially when analysing similarities between graphisms in isolated conditions. This problem can also arise in the context of giving opinions on the authenticity of painter signatures. Examples are known of signing works by the artist's family members. For example, Andrzej Wróblewski's mother, after her son's death, would sign his unsigned works using the son's given name and surname. Also, certain works by her brother, Józef, were signed by Wanda Chełmońska.

1.3. The problems of similarities between graphisms

Handwriting habit is a product of many factors, such as autonomous, environmental or psychophysical conditions. And identification of handwriting is based on the assumptions, confirmed by scientific research and practical experiences, about the individual nature and relative stability of the writing habit. In literature in the area of handwriting studies, authors point to different types of similarities between graphisms. These are environmental similarities, which include family, professional, school (friendly) similarities, or similarities based on sex; random similarities (lookalike graphisms), and similarities relating to a prohibited act, resulting from imitation and repetition [Skubisz-Ślusarczyk 2022, 103].

The qualification of family similarities as environmental similarities is a consequence of their recognition as similarities of the same type as between people spending much time with each other and imitating one another. Children imitate their parents when taking on different activities, which includes learning to write. Sometimes this is unconscious. However, children often observe their parents' graphisms and try to copy or imitate them. As the handwriting habit develops, a person moves away from model calligraphy and individualizes his or her handwriting. At the same time, however, the features of graphisms observed in the handwriting of other people with whom the person spends most time can also persist in the handwriting style.

In the examination of handwriting, family similarities of graphisms are one of the most difficult problems encountered by experts. Even a well-qualified expert may commit an error of attributing authorship to a wrong person, especially when analysing similarities between graphisms in isolated conditions. As a result of the above, when analysing comparative material deriving from several related persons whose graphisms display mutual similarity and similarity with the material put into question, an expert should disregard the analogy and focus on differences that allow to eliminate certain persons from the group of potential authors, and then reverse the order of comparison and, rather than search for analogy in the comparative material with the features considered symptomatic for the material put into question, search in the questioned graphisms for analogies with the comparative material [Widła 2002, 114].

1.4. Examination of the signatures of Jacek and Rafał Malczewski

The research methodology was based on analysis of the comparative material (photographs of painter signatures). For that purpose, during the visits in museums, photographs were made of the signatures of Jacek and Rafał, put on works of unquestioned attribution found in the collections of the following institutions: the National Museum in Poznań, the National

Museum in Szczecin, the National Museum in Kielce, the National Museum in Lublin, the National Museum in Cracow, the National Museum in Warsaw and the Tatra Museum in Zakopane. Examples of these signature are below (Fig. 1, 2, 3 and 4). When examining signatures, attention must be drawn to the fact that throughout their career, artists changed their signing habits. With the above in mind, before starting the analysis, it is necessary to gather reliable comparative material enabling to learn about the handwriting style, but also about the types of signatures used by the artist throughout his creative career. In the discussed case, both painters most frequently used full signatures, whereby Jacek most often would put an initial of his given name, Rafał would put his full given name, and both of them used their full surname. In the light of the above, minuscule signatures were chosen, written in Latin alphabet, of the same lettered content. Out of the entire material gathered, twenty minuscule signatures were chosen for each of the artists. In the author's opinion, a meaningful amount of the research material has been gathered, which allows to draw conclusions.

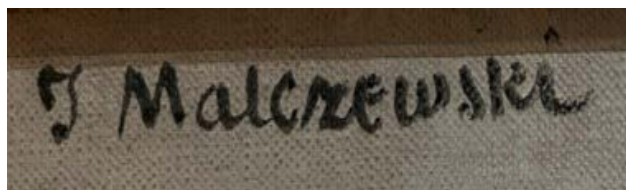


Fig. 1. Signature of Jacek Malczewski



Fig. 2. Shortened signature of Jacek Malczewski

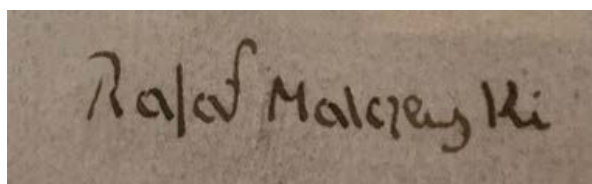


Fig. 3. Example of Rafał Malczewski's signature



Fig. 4. Another variant of Rafał Malczewski's signature

For the purposes of analysis, the comparative graphical method was applied, as used in the examination of handwriting, taking into account external factors that could affect, *ad hoc*, the variability of handwriting, as mentioned above [Widła 2016, 204]. Such external factors include the writing position of the artist, positioning of the painting on the easel and its inclination angle, brushes as tools different from standard writing instruments (brushes of different stiffness and shape), the writing agent – paints of different density, which can translate into handwriting dynamics; and texture of the background surface. The possibility to apply this method to the examination of painter signatures was confirmed on many occasions in scientific research¹ and in expert opinion practice, also of the author. In the comparative graphical method, final conclusions (identification or elimination) are formulated on the basis of all sets of features of the creator's individual handwriting. The examination was carried out using measurement instruments and optical magnification (magnifying glasses and video spectral comparator set "VSC 5000").

Each signature was analysed according to formal features selected out of each group of features examined by the comparative graphical method. These were the following characteristics: a) in the synthetic features set: type and kind of handwriting, degree of handwriting integration; b) in the topographical features set: shape of the base line of a signature, spacing size between letters; c) in the motor features set: impulse and shading; d) in the structural features set: inclined stress vis-à-vis the base, size proportions of selected letters, height of selected letters, i.e.: A) the proportion of height of the second stroke in "M" majuscule to the height of "l" minuscule, B) the proportion of height of the first stroke in "w" minuscule to the second stroke, C) the proportion of height of "c" minuscule to the height of "z" minuscule, D) the proportion of height of "k" minuscule to the height of "l" minuscule. Regarding the measurement of angles, the following features were taken into account: E) the angle between the first descending element and the first ascending element in the "M" majuscule, F) the angle between the first ascending element and the second descending element of "M" majuscule, G. the inclination angle of "i" minuscules vis-à-vis the base line, H) the angle between the stem and the upper side element of "k" minuscule, I) the inclination angle of "c" minuscule vis-à-vis the base line; e) in the modelling features set: the structure of letters, and the structure of selected inter-letter connections.

In principle, linguistic features are taken into account in case of notes longer than signatures, and their purpose is to determine the level of proficiency in a language of the person making the note, and to search for possible linguistic errors. Then, comparative analysis was carried out. The

¹ Above all Widła 2016 and other publications by the same author.

purpose of the research is not to confirm or negate the thesis about inheriting formal features of handwriting but, rather than that, to analyse similarities that may appear in painter signatures as a consequence of environmental influences and to point to these as yet another factor an expert must take into consideration in the expert opinion process.

2. RESULTS

The comparative material gathered is diversified, i.e. it comes from different periods of both artists' creative work. This allowed to learn about the natural changes of the handwriting habits of both artists. Moreover, the material was subject to preliminary critical qualification analysis and, as a result, analogies were identified when it comes to graphisms originating from the same person. As a part of the analysis, it was determined that in all groups of features, similarities are apparent between the graphisms of both painters. In the synthetic features set, similarities are manifest in the general class and picture of writing and the degree of handwriting integration. In the topographical features set, both in case of Jacek and Rafał, the shape of the signature's base line is either wavy or straight, there are similarities in the positioning of letters at different height: lower positioning of "a" minuscule vis-à-vis "M" majuscule (fig. 5 and 6); lower positioning of "s" minuscule vis-à-vis "w" minuscule; the spacing size between letters is also similar for Jacek and Rafał.



Fig. 5. Lower positioning of "a" minuscule vis-à-vis "M" majuscule in Jacek's signature.

Fig. 6. Lower positioning of "a" minuscule vis-à-vis "M" majuscule in Rafał's signature.

In the motor features set, impulse was examined, meaning the number of characters usually drawn without raising the writing instrument [Widła 1986, 43]. Graphisms of both men are characterised by a single-stroke impulse, which means that a signature was made out of letter fragments drawn in separate touches of the background surface with the writing instrument (for letters composed of more than one stroke) [ibid.].

In the structural features set, the selected size proportions of selected letters and angles, as listed above, were examined [Rybak-Karkosz 2022, 127-41]. Then, size relations were calculated, and the results were

presented in tables. The first and the second table contain an abridged version of measurements of all analysed signatures. In the tables, only the highest and the lowest value was placed for the proportions (Table 1.) and angles (Table 2.) from among the total of analysed samples.

	E		F		G		H		I	
	J	R	J	R	J	R	J	R	J	R
Lowest measurement [°]	18,4	16,9	17,4	26,3	62,9	82	15,2	28,8	43,7	79,8
Highest measurement [°]	74,2	67,6	77,1	93	112,5	127,1	109,3	92,3	121,5	140,1

Table 1. The variability range in proportion measurements.

	A		B		C		D	
	J	R	J	R	J	R	J	R
Lowest measurement	0,7	0,76	0,62	0,5	0,68	0,65	1,16	0,66
Highest measurement	2,03	1,49	1,32	1,21	1,38	1,31	2,69	2,01

Table 2. The variability range in angle measurements.

Similarities (marked in green in the tables) are visible for most of the analysed size proportion measurements. In case of angles there are much less similarities, however, the differences are also not big.

On the other hand, in the modelling features set, similarities are apparent in the structure and way of writing of particular letters, i.e. initiation and structuring of the first stroke of “a” minuscule (fig. 7 and 8), two forms of drawing the stem of “l” minuscule, either curved or straight, whereby this method is most often used by Rafał, and much rarer in Jacek’s signatures; in case of “w” minuscule, we can usually see a rounded lower part of the letter in Jacek’s signatures, and the second stroke is slightly lowered vis-a-vis the first one, whereas in case of Rafał this habit is also identifiable but rare. Other similarities refer to the way of writing the “e” minuscule, i.e. one can see a triangular eye and an extended lower element (in Jacek’s case, it is one of a few methods of writing this letter); the way of writing “s” and “z” minuscules (fig. 9 and 10). Similarities are also manifest in the way of connecting the letters “c-z” (fig. 11 and 12) or “w-s” and drawing the character sequence “k-i” in which letter “k” is written as majuscule (fig. 13 and 14).

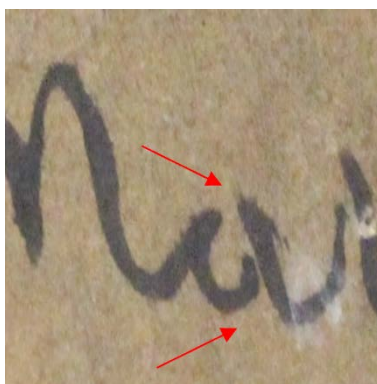
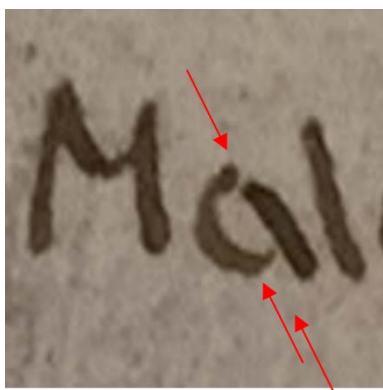


Fig. 7. Initiation and structuring of the first stroke of "a" minuscule of Jacek's signature.

Fig. 8. Initiation and structuring of the first stroke of "a" minuscule of Rafał's signature.



Fig. 9. The way of writing "z" minuscule by Jacek.

Fig. 10. The way of writing "z" minuscule by Rafał.

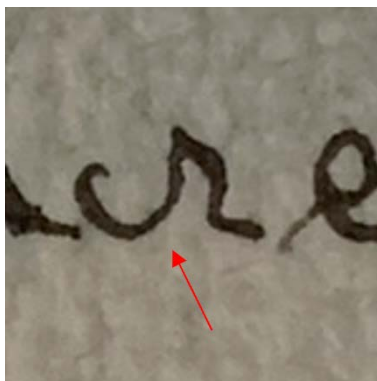
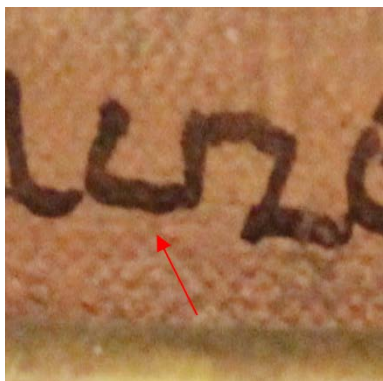


Fig. 11. the way of connecting the letters "c-z" by Jacek.

Fig. 12. the way of connecting the letters "c-z" by Rafał.



Fig. 13. Drawing the character sequence “k-i” by Jacek.

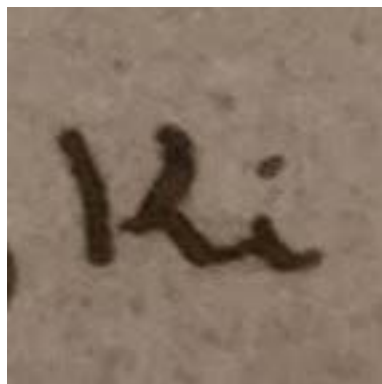


Fig. 14. Drawing the character sequence “k-i” by Rafał.

3. DISCUSSION

The presented results of the research carried out demonstrate similarities between the graphisms of Jacek and Rafał Malczewski in all the groups of features. However, it must be noted that although most similarities should be considered repeatable features in both artists' ways of signing, some of the analogies are only incidental. Moreover, the similarity of graphisms follows from the fact both men were left-handed, which, in any case, is apparent in their signatures (in both cases signatures are inclined to the left side). Left hand dominance in the father and in the son constitutes a strong element of inheriting motor features.

The presented results confirm the legitimacy of examining signatures according to environmental and family similarities, and the need to take into account such possibility especially when it is known that the artists cooperated with one another or that the artist's family members took an active part in the attribution process of the artist's works.

At the end, a limitation should be emphasized of the research capacities relating to the submitted material, that is the missing possibility to directly distinguish the features of a graphism. This follows from the impossibility to collect samples of the input material taken down, for example in the presence of an expert. The analysis described above was carried out on the basis of signatures put on paintings located in museums. As long as their attribution has been unquestioned (in fact, an error cannot be ruled out) and supported by the work's provenance and the authority of the institution, we can only assume that the signatures are authentic.

CONCLUSION

Analysis of the comparative material as a part of preliminary research will allow to improve the research of artistic signatures by compiling a catalogue of identical features of the graphisms of both painters. In the expert opinion process, their reduction from the set of consistent features present in the comparative material and in the material put into question, along with a holistic grasp of the other consistencies, will allow to make an appropriate identification decision. In case of an information that works of a given artist were signed by one of the artist's family members, the examination of family similarities should constitute one of the stages of the conducted identification research intended to establish the authenticity of the signature submitted for analysis and ensure appropriate attribution of the work on which the signature has been placed. In the expert opinion process, one should establish the features present in graphisms of unquestioned attribution, and then treat them as auxiliary features with lower persuasive value [Widła 1999, 219]. The decision about authorship should be dictated by features that are not common for graphisms of the examined authors, as identified in the comparative material [ibid.]. In effect, when pointing to the probable author of the signature put into question, one should not categorically rule out the others.

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