Investigating the First Principle of Nastaliq Script

Fatemeh Shahkolahi

MA in Art research, Faculty of Art and Architecture, Shiraz University, Iran.
Shahkolahi.f@yahoo.com

Abstract: For the first time, Mir Ali ibn Hasan Tabrizi, one of the greatest calligraphers of the Timurid era, established a distinct principle and form for Nastaliq script. The subject of this article is investigating the first principle of Nastaliq script that this calligrapher approved and promoted and the aim is identifying the style and principle used in Mir Ali’s calligraphy as the primary samples of Nastaliq. The sample of this research is a version of Nizami’s Khusraw u Shirin (808 A.H - 1406 A.D) in Freer gallery of art which is of great importance in terms of writing and orthography. The questions are: 1. How is the good-formation in Nastaliq script? 2. How is the good-establishment in Nastaliq script? This study was carried out through a descriptive-analytical method and the data collection methods were a library. This study shows that good-formation in the first Nastaliq script is elongations follow certain and relatively stable rules and are often short and sharp. The form and proportions of the second movement of the circles are similarly repeated in all letters. Dots have the same slope, with no sharp corners and less wide than the pen’s width. Good-establishment appears as at least one elongation in most hemistiches and the elimination of the final letters and some essential dots of the letters. Adding some dots follow the old tradition of writing, and joining some letters likely influenced by the Taliq script. Diacritical and decorative motions are limited to a few instances.

Keywords: Calligraphy, Nastaliq, Principle, Mir Ali Tabrizi.

Introduction

Nastaliq is one of the most commonly used Persian calligraphy, and its elegance and harmonies are a sign of Iranians’ aesthetic spirit. Mir Ali Ibn-Hassan Tabrizi, known as “Qudwat al-Kuttab Moala”, made distinct rules and regulations for this type of calligraphy in the 9th century A.H/ 15th century A.D, and for the first time established the principles and rules of Nastaliq. In this regard, Mir Ali’s role was so important and fundamental that prominent followers and masters of calligraphy in the next years sometimes referred to him as the inventor of Nastaliq.

In the present article, this subject was considered and presented in light of the version of Khusraw u Shirin by Nizami (808 A.H / 1406 A.D) kept in Freer Art Gallery. Regarding the colophon of Khusraw u Shirin version that includes the complete raqam of Mir Ali, it is the only version that can be confidently attributed to Mir Ali. However, no serious and independent study has been done on the calligraphy of this version or the handwriting of Mir Ali Tabrizi as the first principle of Nastaliq so far. Therefore, in this research the handwriting of this artist was investigated, relying on his only authoritative and written work, Khusraw u Shirin. The aim of this study was to identify the principle and methods used in Mir Ali’s calligraphy as the initial examples of Nastaliq.

Research Background

The studies conducted on Iranian calligraphy can be divided into four groups. The first group includes the research that focused on calligraphy from a philosophical and theoretical perspective. For example, the article entitled “Critiquing of Traditionalists Point of view about beginning of Islamic Calligraphy” analyzed the traditionalists’ views on calligraphy and other related metaphysical issues (Mousavi Rokni, 2016: 61-68), the article “The link of the Calligraphy and Tashayyo, in Timurid era” explained the role of calligraphy in spreading religious beliefs in societies, particularly Shi’ism (Abedinpour et al., 2015: 143-170), or the article “A Study on “Permission Letter” in the Realm of Calligraphy” talked about beliefs in this art (Ravanjoo, 2012: 43 -50).

The second group includes the studies on calligraphers’ biographies and are often published in the form of biographies. Some examples of this type are “Tazkerah al-Khatatin” by Sanglakh Khorasani and “Golestan-e Honar” by Ghazi Ahmad Qomi (Sanglakh Khorasani, 2009; Qomi, 2004).

The third group includes the works that describe the terminology and vocabulary of this art. The most comprehensive book in this field is “Dictionary of Calligraphy and Related Arts” by Hamid Reza Ghelichkhani. Also, the book “Calligraphy Terms in the Poetry of Great Iranian Poets” by Azad Mahmudi (2008) is worthy of note. Group four deals with the studies on calligraphy styles, about few studies, have been carried out in recent years in spite of having a long and rich history in the Iranian-Islamic tradition. Among the oldest examples of analytical reviews of Nastaliq calligraphy, which were mainly presented in a theoretical nature and in the form of poems, are “Adab al-Mashgh and Medad al-Khotout” attributed to Mir Emad and Mir Ali Heravi and “Serat al-Sotour” by Sultan Ali Mashhadi (Al-Hassani, 1991: 31; Heravi, 1991: 1, Mashhadi, 1991: 15). Moreover, calligraphy styles were described in more detail in

One of the latest researches in this area is the book “Principles and Basics of Nastaliq” (2015) by Roohollah Eshaghzadeh, which compared the handwriting styles of Mir Emad and Master Amirkhani. In addition, articles such as “A comparative study on calligraphy of Rashida Shahnama with Abdul Rashid Dailami’s calligraphy style” (Pazkaz & Faradi, 2012: 5-19) and “A Comparative Study of Two Common Styles of Nastaliq by Mir Emad al-Hassani and Mohammad Reza Kalhor” (Ansarian, 2015: 40-49), dealing with the analysis of each Nastaliq calligrapher are worthy of attention. In his article entitled "Emadolaktab: Preface of Iranian Contemporary Calligraphy”. Kaveh Teimouri investigated the style of Emadolaktab and its importance as the link between Qajar and contemporary calligraphies (Teimouri, 2010: 16-25).

In the article "An Analysis of Nastaliq Baseline in Mir Emad's Style", Mohammad Mehdi Gheta’e investigated the way letters were placed on the baseline in Mir Emad’s Style (Gheta’e, 2001: 82-87). In his article “Penmanship of Khatm al-Gharaeb Version”, Jalal Matini compared this version with some old Persian versions, which was closer to linguistic studies. For example, the letter “” in these versions has four forms: "ل", "ل", "ل", and "ل" (Matini, 2007: 95-102). In his article "Signs, Arrays, and Decorations in Pahlavi and Avestan Handwritings”, Bahram Broumand amin described how initial words were written in headings and how flowers were used instead of dots, and they used animal and human figures to decorate or mark letters, etc. in Pahlavi and Avestan handwritings. (Broumand amin, 2007: 369-388).

Hoda Kaspur and Abdolreza Chareie, in the article entitled "A Comparative Study of Influential Calligraphers' Scripts on the Product of Calligraphy Software with the Conventional Methods in Nastaliq (Kalhor and Memrad Styles) and Sol's Scripts (Turkish and Arabic Styles)" referred to one of the newest fields in calligraphy and analyzed the impact of Mir Emad’s and Kalhor’s Nastaliq, and Sol's script in Turkish and Arabic styles in the production of calligraphy software (Kaspur & Chareie, 2013: 51-63). These types of studies, which often do visual analysis of the masters' calligraphy, are closer to the nature of the present research, but so far, no research has been done to investigate Mir Ali’s calligraphy.

Research Questions
The research questions are as follows: 1. How is the good-formation in Nastaliq script? 2. How is the good-establishment in Nastaliq script? In order to answer the first question, letters were classified into four groups in terms of the type of writing: elongations, circles, singualrs, and dots. To answer the second research question, Mir Ali's calligraphy was analyzed in terms of the reduction and addition of dots, reduction of letters, decorations and arrays, letter linkage, and types of lineation.

Research Method
The method used in this study is descriptive-analytical. In this research, the works of Mir Ali Tabrizi were analyzed based on two general principles of calligraphy, namely good-formation (Hosn-e Tashkil) and good-establishment (Hosn-e vaz’e) through a visual method. The data collection methods were a library (written documents) and field (direct observation). In the field method, each Persian letter was sampled and enlarged from the Khusraw u Shirin version. Then they were linearly executed in order to analyze the shape of the letters and find the writing rules used therein.

Theoretical Basics
• Mir Ali Tabrizi and Khusraw u Shirin Version
Mir Ali Tabrizi was one of the greatest calligraphers of the era of Amir Timur Gurkani (771-807 A.H/ 1370-1405 A.D) and his son Shahrokh (807-850 A.H/ 1405-1447 A.D). In biographies and historical books, his life and art have been mentioned a lot, and he has always been praised by calligraphy masters. He was born in 762 A.H/ 1360 A.D in Tabriz and his father was Mir Ali Soltani, one of the prominent calligraphers in the eighth and ninth centuries A.H/ fourteenth and fifteenth centuries A.D. As Mirza Sanglakh stated, Mir Ali’s death was in 850 A.H/ 1448 A.D (Sarmadi, 2000: 913). One of the most controversial subjects in historical sources is whether Mir Ali Tabrizi was an inventor or estabilisher. Mir Ali Heravi in “Medad al-Khat”, Majnoon Rafighi Heravi in “Khat & Savad (Handwriting & Literacy)”, and Gholam Mohammad Haftghalmi in “Calligraphers’ Biographies” considered Mir Ali as the inventor of Nastaliq (Heravi, 1994: 8; Rafighi Heravi, 1994: 258; Haftghalmi Dehlavi, 1860: 42).

Some of the works that experts attributed to Mir Ali include: The album of the prayers of Imam Ali (pbuh) with Persian translation in the Library of the Golestan Museum, a manuscript of Khamseh by Nizami and Amir Khusraw Dehlavi in 824 A.H / 1422 A.D at Tehran National Library, a manuscript of Sa'di’s Kulliyat in a personal collection dating back to 840 A.H / 1438 A.D, and a manuscript of Sa'di's Bustan dating back to 779 A.H / 1377 A.D. The only version containing the complete raqam of this artist, Mir Ali Ibn Hassan Tabrizi, and can be confidently attributed to him is Nizami’s Khusraw u Shirin version in 808 A.H / 1406 A.D (Fig. 1).

![Figure 1. The complete raqam of Mir Ali Ibn Hassan Tabrizi in the colophon of Nizami’s Khusraw u Shirin. Source: Freer Gallery.](image1)

The illustrated manuscript of Khusraw u Shirin numbered 3134, is kept in Freer Gallery of Art, Washington. The text of the manuscript was written on high-quality, starched beige papers in 808 A.H / 1406 A.D, and the wide margins of the book, separated from the text by green and golden tabulation, are embellished with golden sprays. The dimensions of the document are 18.3 cm by 12.7 cm. Each page consists of 4 columns of 25 rows, and each column contains a hemistich. The rows were often written horizontally but some were oblique. This lineation style that appeared for the first time in this version, was later expanded and diversified in other Iranian manuscripts (Fig. 2). Each page was written in two different styles, palpable and covert (Jali and Khafi). The headings were placed in inscriptions of Sol's handwriting in blue, golden and white and in the second and third columns. The initial title of the version was written in decorative Kufic handwriting of the same size as the headings.

![Figure 2. A two-page instance of Nizami’s Khusraw u Shirin version. Source: Freer Gallery.](image2)

**Findings**

By setting up certain rules for Nastaliq, Mir Ali Tabrizi developed this handwriting independently and gave it a clear identity. These rules were mostly based on subtle and delicate movements to the extent that, in comparison to other handwritings, Nastaliq shows the Iranians’ artistic spirit and taste in the best way (Fig. 3). In old treatises on calligraphy, a narrative has been told in which one night Mir Ali saw flying geese in his dream and inspired Nastaliq's fluid movements from the soft movements of these birds during flight (Fazaeli, 2011: 454). In Mir Ali’s calligraphy, beauty and ratios, harmony and stability were attained to perfection, and most of the motions of the letters were based on curves. Therefore, Mir Ali Tabrizi’s handwriting can be examined on the basis of two principles including good-formation (Hosn-e Tashkil) and good-establishment (Hosn-e vaz’e).
Figure 3. The use of soft and fluid movements in Mir Ali’s Nastaliq handwriting in Nizami’s Khusraw u Shirin version compared to other handwriting. Source: Freer Gallery.

- **Good-formation (Hosn-e Tashkil) in Mir Ali Tabrizi’s Script**

  Good-formation or good-writing means observing the principles and rules of writing the letters, including ratio, level, cycle, strength, weakness, real and virtual ascension and descension. In this regard, good-formation in Mir Ali’s handwriting were investigated in four categories including elongations, circles, singulars, and dots.

1. **Elongations**

   Elongations are of particular importance in a calligraphic work because of their horizontal and relatively large structures. These letters include (ب), (ک), (گ), (ف), inverse (ی) and the first movement in elongated (س). The letter (ب) appears in both long and short forms. Long (ب) has 8 dots length and approximately 2 dots height (Fig. 3). The start and end of (ب) are not in the same direction, but its tip is 0.5 dot longer. The angle of placing the pen is 60 degrees at the beginning of (ب) and it ends up to about 90 degrees.

   The rules used in writing short (ب) include four dots length, 1.5 dots height, 0.5 dot depth, and its beginning and end are in the same direction. Contrary to (ب), the letters (ک), (ف), and inverse (ی) are written with two movements of the pen. All (ک) letters are written without a second oblique line and as (ک). The oblique lines are steep and the angles between them vary from 40 to 50 degrees. Of course, in Mir Ali’s handwriting, the oblique lines do not have a constant position and are placed in different positions due to fast writing.

   The height and width of the head of (ف) are lower than one dot, lacking a bottom excess for better linking elongation to it. Elongation of the letters (ف) and (ک) is exactly the same as that of (ب). The letter (ف) in the interconnected mode, as in the word نفس, is without an empty space, and its size is very small. The inverse (ی) used in Mir Ali’s script is usually connected and rarely separated, although its connected and separated forms are written with the same rule and do not differ in appearance. This elongation is from left to right and has a gradient of 1 to 1.5 dots. Its length is much lower than usual and varies from 7.5 to 8 dots. The empty space between the head of the inverse (ی) to its elongation is 1 dot. Elongated (س) has 9 dots length, 5 dots height and a gradient of about 40 degrees.

   Figure 4. Rules of Good-formation in Elongated Letters in Mir Ali’s Script. Source: Author.

2. **Circles**

   The group of round letters includes (ن), (ق), (ص), (ل), (س), the second movement of elongated (س), (ع), (ح), and (ع). All the round letters except (ن) are written with two or more movements of the pen. The mouth of the letter (ن) in Mir Ali’s script is 3 dots, and its lower left side is slightly deeper. Also, the dot of (ن) does not have a fixed position but is often located in the center of the negative space (Fig. 4). The circular part of the letters (ق), (ص), (ل) and (س) are written in the
same way as the letter (ؤ). The head of (ق), like the head of (ـ), lacks the excess necessary to connect the head to the round part, and its dots are located in different positions. The head of (ص) is written from the beginning to the end with a uniform thickness of about 1: 3 width of the pen and lacks necessary strength and weakness. The letter (ج) consists of (الف) with a height of 3 to 3.5 dots and a shape similar to the letter (ؤ). The teeth of (ـ) have the large slope and are written on the baseline. Following the principle of strength and weakness in calligraphy, the teeth are well separated. The first and second movements of (ج) which have a spiral shape and make the head of this letter are written without strength and weakness and the mouth of (ج) has decreased by one dot. The heads of (ح) and (ع) are approximately 1.5 dots and the round sides of these two letters are 3.5 dots.

![Figure 5: Rules of Good-formation in Rounded Letters in Mir Ali’s Script. Source: Author.](image)

3. Singulars
In the group of singular letters, (الف), (و), (ر), (ه), (ط), and (ل) can be examined. There are 3 forms of (الف) with different pen-placement angles and curvatures in Mir Ali’s script, but in general, the first form has been repeated more than the two others in this version (Fig. 5). The height of (الف) is rarely 3 dots and it is lower in most cases. The height of (الف) in the letter (لم) is lower than normal and varies from 3 to 3.5 dots. Besides, in some cases, (الف)s have deviated from their direct was and appear to be tilted.

Depending on the letter after it, the letter (ـ) is written in two forms. The first is preceded by the letters (ف), (س) and (م), and has an open and wide mouth. The second, which is the most common form of (ـ), is written before all the alphabet letters, except for the letters above, and has a mouth of almost one dot. The heights of both forms of (ـ) are 2 dots, and there is no break or sudden angle change at the end of them, and their thickness gradually decreases. There are two forms of (ر) in Mir Ali’s script. The first form is after the letters (ف) and (ذ) and is similar to a 50-degree slope line with a height of lower than 2 dots. Its thickness is the same from the beginning to the end and is about 1: 3 of the width of the pen. The second type is written after all the alphabet letters except for (س) and (ـ). It starts with 2 dots above the baseline with 1: 3 of the pen, reaches the 1: 2 of the pen in the middle and gradually decreases its thickness. The head of (س) is written like that of (ـ) and appears to be multi-dimensional rather than circular and rounded. The second movement of the letter (س) is like the second form of (ـ).

The roundness and curvilinear movement of the letter (ل) is without strength and weakness, and the whole letter is written in two thicknesses. The initial and middle parts are written with the entire tip of the pen and the rest is written with 3: 4 of the pen. Therefore, its width is more than 1 dot, and it looks heavy and unbalanced. (ل) namely “two eyes” is rarely found in Mir Ali’s handwriting, and (ل) namely “earring” and (ـ) are often used at the beginning and in the middle of the words, respectively. Of course, the bottom movement (the earring) in the letter (س) namely “earring” has been eliminated. The head of (ـ) is similar to the first movement of the letter (ص). Its (الف) is relatively short and about 2.5 dots, as in the first type that (ـ) is connected to the middle of the first movement.

![Figure 6. Rules of Good-formation in Singular Letters in Mir Ali’s Script. Source: Author.](image)
4. Dots
In Mir Ali’s script, the dots are less wide than the pen’s width, and the corners are without sharpness and with different curvatures. The punctuation angle is 60 degrees, and the diameters of the dots are 15 degrees towards the left (Fig. 6). Double dots are often isolated and spaced apart, and sometimes joined. The diameters of the two dots are not in the same direction, and each has a separate axis (lines A and B). There are rarely vertical double dots, and they are often written at the end of the line and where the scribe faces a shortage of space.

![Figure 7. Rules of Good-formation in Singular and Double Dots in Mir Ali’s Script. Source: Author.]

Triple dots in Mir Ali’s script have been written with a particular rule. The first two dots are precisely aligned with the double dots principles, but the third dot sometimes tends to the right or left. Another form of triple dots is horizontal. That is to say, all the three dots are arranged horizontally with the same distance (Fig. 7).

![Figure 8. Rules of Good-formation in Triple Dots in Mir Ali’s Script. Source: Author.]

**Good-establishment (Hosn-e Vaz’e) in Mir Ali-Tabrizi’s Script**

Good-establishment means to adhere to lineation principles, which includes how to link the letters together, the proximity of the words, and the type of composition in the row. Good-establishment in Mir Ali’s script can be examined through elimination and addition of dots, elimination of letters, decorations and arrays, letter linkage, and type of lineation.

1. **Elimination and Addition of Dots**
   In most cases, Mir Ali put the dots according to the needs of the letters or words, but sometimes he eliminated a few dots in the row or added some others to the letters in a decorative way. Some examples of eliminating or adding dots under the letters such as elongated (س) and (ش)، reverse (ی)، (ی)، and (ک) are presented in Table 1.

2. **Elimination of Letters**
   In many hemistiches, the final letters and words of the fourth column on each page have been eliminated. Examples of these eliminations are given in Table 1.

3. **Decorations and Arrays**
   Among the decorations of the letters is diacritic that rarely exists in Mir Ali’s handwriting. For example, the letter (+) has been used with two functions: an extra “e” sound on the silent letter (+)، and the (؟) sign. Moreover, under the letter elongated and non-elongated (ص) a movement similar to the head of (ص) has been done. Examples of these decorations are presented in Table 1.
4. Letter Linkage
In Mir Ali’s Nastaliq style, when the final (ه) comes after the letters (ر), (ز), (و), (ذ) and (د), it is linked to the preceding letter. Examples of these connections are presented in Table 1.

5. Type of Lineation
In Mir Ali’s lineation type, there is at least one elongation in each hemistich which is often at the beginning or the end of the row. Some of Mir Ali’s lineation forms are presented in Table 1 according to the priority and frequency, and with regard to the location of the elongations.

Table 1. Rules of Good-establishment in Mir Ali’s Script. Source: Author.

Discussion
Examining the script by Mir Ali Tabrizi and the rules used in writing each letter, one can consider a pattern or standard for each group of letters as follows: elongated, circular, singular, and dots. According to Good-formation in Mir Ali’s script, there exist the following patterns:

The pattern of Elongated Letters: Elongated (ب) with 8 dot length and 2 dot height can be considered as the base for writing these types of letters, except for elongated (س). It is in the form of short or incomplete elongation, and full elongation is rarely seen in the works of Mir Ali. Besides, some kind of sharpness due to low length and high height of elongations can be seen in a majority of letters.

The pattern of Rounded Letters (Circles): In all the circles, with the exception of (ح), (ع) and (و), the second movement that forms their roundness is repeated as the base form of the rounded letters. In Mir Ali’s handwriting, this shape is the result of a movement around a circle with a diameter of 3 dots, starting from 2:3 on the right and up to 2:3 on the left of the circle, and its left side is slightly deeper. The roundness of the letters (ح) and (ع) are done with the same rule but slightly larger and more open than other letters’. The mouth of (و) has been reduced to 1 dot, contrary to the base shape of the rounded letters. In none of the rounded letters, there is the common thin and vertical mode of round letters before the last part and prior to joining the roundness (area A in Figure 8). As a result, eliminating such weaknesses in calligraphy causes the heads of the letters with roughly 1:2 wide to be connected to the base shape and eliminate the elegance and beauty of the script.

The pattern of Singular Letters: In singular letters, due to the nature of the letters and the type of writing them, no fixed criterion can be considered. Meanwhile, one can only point to the movement of the pen in writing the letter (ر), which is repeated in the second movement of writing (و) as well.

The pattern of Dots: In Nastaliq, dots have the shape of diamonds, run with the full width of the pen. But in Mir Ali’s handwriting, dots are not as big. The punctuation angle is 60 degrees and moves to the left of the baseline by 15 degrees. In upward triple dots, like in the letter (ش), the third dot tends to the right, but in downward triple dots-like in the letter (پ), the third dot tends to the left.
According to Good-establishment in Mir Ali’s handwriting, the rules used in the combination of letters and words are as follows:

The distances between the letters and words are not the same, but in many cases, the distances between the letters are greater compared to those between the words. The lack of proper placement and proper adjustment of the letters and words not only disturbs reading the text but also causes many final letters or words in the columns to be deleted.

In the rules of Nastaliq calligraphy, connection and entanglement of the letters and words are not permissible. The presence of this feature in Mir Ali's Nastaliq might be the continuation of Taliq handwriting which was the common handwriting of Iranians until the advent of Nastaliq. In Mir Ali's handwriting, the elimination of dots, the decorations and arrays, and the position of elongations at each hemistich are often seen proportionate to the type of the composition of the rows. Adding decorative dots below some letters also follows the old tradition of handwriting. These decorative dots are located exactly below the main dots. So that a vertical line is imagined in the minds of the viewer along the top and bottom dots (Fig. 9).

Figure 9. Lack of thin and vertical mode before connecting to the roundness in Mir Ali’s handwriting. Source: author.

Good-establishment in Mir Ali’s handwriting consists of four groups including elongations, circles, singulars, and dots. The letter (ب) is often used as the base form for writing most of the elongated letters. There are slightly short and incomplete, and rarely fully elongated long letters. The short length of the elongated letters and their high altitude have caused some kind of sharpness in the elongations. The forms and proportions of the second movements of the circles have been repeated in the same way and follow a certain pattern. However, this pattern is slightly more prominent and larger in letters (ق) and (س) and is slightly smaller in the letter (ش). The movements and proportions have been implemented in the same way in the singular letters (ش) and (س). The dots are less than the width of the pen, and the corners are without sharpness and with different curvatures. The punctuation angle is 60 degrees and the diameters of the dots diverge 15 degrees from the baseline. The third dot in the upward triple dots is towards the right but it tends to the left in downward triple dots.

Conclusion

Good-establishment in Mir Ali’s calligraphy can be investigated through five categories: addition and elimination of dots, elimination of letters, decorations and arrays, letter linkage, and type of lineation. The linkage of some letters is probably the continuation of Taliq script, and the addition of dots follows the old tradition of writing. Elimination of dots, decorations and arrays, and the position of elongation are also mostly dependent on the type of row composition.

Postscripts

1. Colophon refers to the information that the scribe writes at the end of the script. The name and logo of the book, as well as the creator, the time and the place transcription are usually brought in the colophon.
2. "Raqam" means the artistic signature. The artists of the ancient era did not sign their works for various reasons, including the lack of recognition of social status, the group characteristics of artistic production, and consequently, ethical and personal standards. Such a formality was established in Iran until the end of the eighth-century A.H/ the 14th century A.D, but it gradually became commonplace in the Timurid era (Pakbaz, 2002: 255-256).
3. "Spray" is used to decorate the pages in manuscripts, using sprayed golden dots (Pakbaz, 2002: 33).
4. The width of palpable (Jali) pen is 6 mm to 2 cm (Ghelichkhani, 1994: 194) and that of covert (Khafi) pen is 0.5 to three-quarters of a millimeter (Ibid.: 165).
5. The angle between the tip of the pen and the paper.
6. When the width of the pen reaches its widest state or the width of that part of the letter becomes equal to the real width of the pen, it is called the pen’s strength (Ibid.: 178). When the pen makes a shape thinner than the full pen or has less width than the full pen, such as the tip-pen or half-pen, it is called the weakness (Ibid., 144).

References
• Kaspur, H., Chareie, A. R. (2013). A comparative study of influential calligraphers’ scripts on the product of calligraphy software with the conventional methods in Nastaliq (Kalhor and Miremad styles) and Sol's scripts (Turkish and Arabic styles), Negareh. 8 (25): 51-63.