

Analysis the character of J.S.Bach's Sinfonia in A major (BWV 798) – based on the dynamic and research on related acoustic parameters

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Abstract. Various annotations of the character of J.S.Bach's clavier music in piano perform seem to be under discussion by the pianists and musicologist. However, the extent of dynamic and the way of dynamic changes that had been considered appear scarce. In the essay below, the extent of the dynamic and the way of dynamic changes of J.S.Bach's Sinfonia in A major (BWV 798) in piano perform is under analysis and discuss.

1 Introduction

Since the Baroque clavier to contemporary piano, the Great changes have taken place in the production materials and sound generation principles. In the past hundred years, the character of J.S.Bach's clavier music in piano perform had been analysis-ed and discussed. Alongside this growing dispute there has been much debate over how to define the extent of the dynamic and the way of dynamic changes of J.S.Bach's clavier music on piano performance. However, due to the limitations of the times, there is no recording of the performance in the Baroque period, and the contemporary piano has long changed, researchers can only infer the extent of the dynamic and the way of dynamic changes through the dynamic annotation of the score and the literature records, which gives musicians and enthusiasts a space to explore and seek knowledge.

At the moment, most pianists and musical researchers are disagree with restore or imitate the Baroque clavier tone colour, but they are quite approve of retain the Baroque perform style. As the aspect of dynamics of Baroque clavier music in piano perform, Although many pianists and musical researchers believe that it is necessary to "crescendo and diminuendo" conditionally on the basis of retaining the Baroque music performance style, it should not be much dramatic. However, judging from the various documents read at present, each experts and researchers have different standards and interpretation methods for this viewpoint; Some aspects are even more subjective and generally, without any distinct, objective and specific suggestion.

Therefore, in addition to combining relevant literature and scores, this research attempts to analyse the audio of the same music segment in J.S.Bach's Sinfonia in A major (BWV 798) by different performers by computer technology, quantify and compare the relevant parameters at the level of performance

dynamics by means of waveform diagram (dynamic curve), and then draw a more intuitive conclusion.

2 Methods

Compare with the former researches and essays' methods, which shows their methods worth to learn, but are still one-sided and subjective. For example, Chen en en mentioned that she did not agree to imitate the tone colour of Baroque clavier with modern pianos, but she believes that "it is still very necessary to consider the overall dynamics characteristics of the ancient piano music in the Baroque period when performing." [1] Although, She had compared different pianists and researchers' suggestions and came to the conclusion that dynamics and tone colour contrast should be appropriately applied according to specific musical factors, which lacks specific examples, and she still not gives a more specific method of 'how to consider and perform after considered.' [1]

After 9 years, Tan Yun believes that "the Baroque clavier works should be treated with a diversified perspective" [2], because the musical instruments are constantly developing, it is necessary to treat the piano performance with a developmental perspective, and also pay attention to the aesthetic value of the baroque style. He had compared the different pianists' performance of the same Baroque pieces, but he only explained the results of the comparison through his personal description, which also led to the inevitable subjective color of his results. Finally, he also had not given specific practical suggestions [2].

According to the advantages and disadvantages of the above research methods, this research intends to further inherit the previous research methods and use the following three research methods:

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2.1 Compare the different scores' dynamic marks

This research had collected 8 different versions of scores of J.S.Bach's Sinfonia in A major (BWV 798). Among them, two of them are original manuscripts in the early and mid-18th century [3,4], three are printed versions from the middle and late 19th century to the early 20th century [5-7], and latter three are domestic and foreign popular versions published in the 21st century [8-10], which are span nearly three centuries. By comparing the editions of these three periods, we can roughly understand the similarities and differences in the interpretation of dynamics in J.S.Bach's Sinfonia in A major (BWV 798) in different periods.

2.2 Compare the different researches' analyses and discussions

This research try to compare different literature to to find out the similarities and differences about the extent of the dynamic and the way of dynamic changes of J.S.Bach's Sinfonia in A major (BWV 798), and try to summarize the commonalities of their thoughts.

2.3 Analyzing the performance audio of different pianists by computer technology

Up till the present moment, the research has selected five performers: Tatiana Nikolayeva (1924-1993) [11], Glenn Gould (1932-1982) [12], András Schiff (1953-present) [13], Zhu Xiao-Mei(1949-present) [14], and Yunchan Lim (2004-present) [15]. These performers are active from the 20th century to 21st century, with a time span of nearly hundred years, and their active places are all over Europe, America and Asia. They have a high recognition in the music world in Performing Bach's clavier works, which has a certain comparative and reference value.

3 Results

Through the analysis of the above three methods, this research obtained the following results.

3.1 The results of compare scores

This research had compared the editions of Holograph manuscript and H.G.M. Darnköhler's manuscript scores [3,4], Carl Czerny [5,6] and Ferruccio Busoni's editions of print score [7], and three 21th century China and International editions: Wiener Urtext Edition, Henle Verlag, People's music Publishing House [8-10]. The extent of dynamic and the way of dynamic changes of J.S.Bach's Sinfonia in A major (BWV 798) in these eight editions' scores will be shown in the following table:

Table 1. Different Scores of J.S.Bach's Sinfonia in A major (BWV 798)

Editions	Extent of dynamic	Way of dynamic changes (and times)
Holograph manuscript (1720) [3]	No any dynamics marks	No any expression
H.G.M. Darnköhler (1745) [4]	No any dynamics marks	No any expression
Carl Czerny (1840) [5]	p-f-fz	crescendo (8) diminuendo (5)
Carl Czerny (1903) [6]	p-mf-f	crescendo (15) diminuendo (9)
Ferruccio Busoni (1891) [7]	p-mf-f-fz-ff	crescendo (13) diminuendo (3)
Wiener Urtext Edition (2013) [8]	No any dynamics marks	No any expression
Henle Verlag (2014) [9]	No any dynamics marks	No any expression
People's music Publishing House (2000) [10]	p-mf-f	crescendo (8) diminuendo (4)

3.2 The results of compare literature

With the revival of Baroque clavier music, the trend of "authentic performance" gradually rises from mid and late 20th century in Europe, which has a dispute with "modern performance style" from 19 century. For the reason of "authentic performance" had encouraged pianists to imitate the tone colour of Baroque clavier when they perform Baroque clavier music on piano, which included that limit or even prohibit the undulation movement of dynamics change.

For the moment, this research had not sought out any literature had discussed the dynamic of J.S.Bach's Sinfonia in A major (BWV 798). However, the dynamic of Bach's clavier works had been mentioned and discussed frequently. Although there is a great controversy between "authentic performance" and "modern performance style", most of pianists and researchers are still consist "crescendo and diminuendo" are necessarily, they believe that the esthetic values of music its-elves are more important than the tone colour of Baroque instruments.

For instance, Alfred Brendel (1931-present), when he was interviewed by David Dubal, he had mentioned that "Musical instruments are not the only way to revival of Bach's music" [16]. This viewpoint was supported by Richard Goode (1943-presents), he emphasized that the best way to interpret Bach's clavier music is to understand the music itself from the heart, rather than the superficial factors [16].

If former two pianists just explained their views of use Baroque music instruments to perform Bach's music, Rosalyn Tureck (1914-2003) had went further and elaborated her views on the dynamic changes of Bach's clavier music works. She disagreed with rely on Baroque music instruments to understand and use dynamics on piano performance of Baroque clavier musics, she

believed that “the different of dynamics is the product of Baroque music's structures” and “the difference in dynamics must be as accurate as the music structure.” [17]. She claimed that “crescendo and diminuendo are also exist in the piano performance of Bach’s clavier music, but it only plays a minor role” [17], because “the dynamic change should be reflected on the first note of new tone colour, the habit of continuing crescendo and diminuendo are not suitable for Bach’s music” [17].

3.3 The results of compare pianists perform

This research had tried to collect some pianists’ performance audios and analysis them by using computer platform to export audio waveform. There are five pianists had been chosen: Tatiana·Nikolayeva (1924-1993) [11], Gleen Gould (1932-1982) [12], András·Schiff (1953-) [13], Zhu Xiao-Mei(1949-) [14], and Yunchan Lim (2004-) [15]. These pianists were active throughout the 20th century to 21st century, with a time span of nearly 100 years, and their active places were all over Europe, America and Asia. They were highly recognized in performing Bach's clavier music in the music world, which is of certain comparison and reference value.

The 9th bar to 12th bar of J.S.Bach’s Sinfonia in A major (BWV 798, Fig.1 in blue shadow) has been chosen to analysis the audio of these six pianists piano performing, because of the dynamic changes in these three bars are quite luxuriant, which can be helpful to find out the differences of the way of dynamic changes between these six pianists performance.








Fig.1. The 9th bar to 12th bar of J.S.Bach’s Sinfonia in A major (BWV 798), cited in Czerny, C. (1840) No.XII, p.42 [5].

After using computer platform, the waveform of pianists perform BWV798’s 9th bar to 12th bar were showed in following chart.

4 Analysis and compare

In the table 2 had listed the waveform of five pianists performed the 9th bar to 12th bar of J.S.Bach’s Sinfonia in A major. Though the analysis of the table 2, this research will compare and discuss the performance of these five pianists, to find out their opinions and deductions about the dynamic changes.

Table 2. Waveform of five pianists performed the 9th bar to 12th bar of J.S.Bach’s Sinfonia in A major

Pianists	Waveform
Tatiana Nikolayeva (1977) [11]	
Gleen Gould (1955) [12]	
András Schiff (2011) [13]	
Zhu Xiao-Mei (2015) [14]	
Yunchan Lim (2020) [15]	

4.1 Tempo

From the viewpoint of the tempo, it is quite hard to show up from the waveform. However, after contrast their performing audio, it is not difficult can find out that tempo who performed fastest in these five pianists is Gleen Gould, he cost 59 seconds played the whole piece [12]. The second one is Yunchan Lim, who played whole piece and costed 1minute and 14 seconds [15]. Zhu Xiao-Mei and András Schiff’s tempo seems at the same level [13,14], which keep between 1 minute and 19 with 21 seconds. Tatiana Nikolayeva’s performing is the slowest one, which costed 1minute and 31 seconds [11].

4.2 The tend of dynamic changes

If only from the condition of the waveform demonstrated, these five pianists have different opinions and the ways of performing about the tend of dynamic changes of these three bars: Gleen Gould [12] and András Schiff [13] are support use less undulating dynamic contrast in these three bars’ perform; Tatiana Nikolayeva [11], Zhu Xiao-Mei [14] and Yunchan Lim [15] are tend to use more undulating dynamic contrast when play these three bars.

Combining audio and table 2, it can be seen that Gleen Gould [12] and András Schiff [13]’s performing are not very obvious in dynamic change, these three bars’ seems maintian in piano and quiet, which seems opposite with Gleen Gould [12]’s previous viewpoint in former paragraph and sounds like it conforms to the characteristics of harpsichord: without “crescendo and diminuendo” .

Compare with Gleen Gould [12] and András Schiff [13], Tatiana Nikolayeva [11], Zhu Xiao-Mei [14] and Yunchan Lim [15] performance are different: the change of tone colours and dynamics are more variable,

especially Tatiana Nikolayeva's performance, which can be heard three levels of dynamics changes, Fig.2 had showed the first level: the dynamic changes from *c2* to *g1* in the top part and shows a diminuendo trend



Fig.2. The three levels of dynamic changes: C--B--A--G

The second level is the dynamic changes of melodies undulate: the short melodies consisting of eight and sixteen notes and appear in the top part and inner part, which were showed in Fig.3, completely consistent with the trend of melody.



Fig.3. The three levels of dynamic changes: the dynamic changes of melodies undulate

The third level is the dynamic changes appear in the bass and showed in Fig.4: gradual diminuendo based on melodic motives.



Fig.4. The three levels of dynamic changes: the bass

According to the waveform, Zhu Xiao-Mei [14] also had some dynamic undulate in her performance. different with Tatiana Nikolayeva [11], she prefers to use diminuendo at the beginning and use crescendo after the beginning of these tree bars (showed in Fig. 5):



Fig.5. The dynamic changes in Zhu Xiaomei's perform

As for the Yunchan Lim [15], it is quite hard to recognize the trend of dynamic changes in his perform just by analysis the waveform. However, when combine with the audio, the dynamic changes can be clear that the long notes in top part are louder and more prominent, which was similar with Tatiana Nikolayeva [11] and Zhu Xiao-Mei [14]'s perform. he had not do some obviously crescendo or diminuendo during these three bars.

4.3 Extent of dynamic

The extent of dynamic changes can be hard to identified only by waveform and audio, which makes this research have to combine the waveform, audio and the dynamic marks on different scores together to analysis the extent of dynamic changes of these five pianists had used in there perform.

In former paragraph, this research had compare the dynamic marks of 8 different editions scores and had listed their marks of dynamic changes, it is obviously can find that most of them shows the dynamic changes are between "p" and "f". in 9th to 12th bars, the marks of dynamic changes are between "p" and "mf".

For the analysis of the waveform, it just can recognize the trend of dynamic changes, and cannot define the extent of the dynamics. However, when analysis audio, it can be clear to find that the extent of dynamic changes are basically in line with the marks on the scores.

5 Contrast and discuss

After analysis and compare the waveform, audio and scores, this research will continue to contrast and discuss the dynamic changes when play J.S.Bach's Sinfonia in A major (BWV 798) on modern piano.

5.1 The trend of dynamic changes: Is crescendo and diminuendo can be use in Bach's music when play on the modern piano?

By the analysis and the compare of the waveform, it shows that the result are still consistent with the current state of research and performance: there exists comparatively disputes about Whether there should be obvious dynamic contrast or the trend of crescendo and diminuendo. This research had just selected 5 pianists and three of them chose to use crescendo and diminuendo in their performance, which may reflect the that nearly half of pianists may support do not use dynamic changes when play Bach's music on morden piano, but another half of pianists believe that they can use crescendo and diminuendo in their performance.

However, even in this research have three pianists had chosen to use crescendo and diminuendo in their performance, but the methods and ways of crescendo and diminuendo are still different. Although Yunchan Lim [15], Tatiana Nikolayeva [11] and Zhu Xiao-Mei [14] were all choose to play the long notes in the top part louder to prominent the trend of melody texture, but

Yunchan Lim [15] had not do some crescendo or diminuendo during these three bars. Even Zhu Xiao-Mei [14] and Tatiana Nikolayeva [11] both had crescendo or diminuendo in these three bars, but the trends of crescendo and diminuendo are also not same.

From the above paragraphs, it can be seen that even still disputed, maybe the trends are different, but crescendo and diminuendo can be used in modern piano perform Bach's music.

5.2 The extent of dynamic changes

According to the above paragraphs, it has listed and analysis that the scores between 19th to early 20th century had written the dynamic marks, most of them extent between "p" and "f", some of them can reach "fz" even to "ff". However, according to the tone colour of Baroque time clavier, with the technology at that time, it was seems quite difficult to play timbres' dynamic that could reach "fz" or even "ff"(both harpsichord and clavichord), and also clavichord may can play dynamic "p", but harpsichord is seems to be hard to play dynamic more quiet.

Meanwhile, according to above five pianists perform audio, no matter what kind of contrast they use in their performance, the dynamic extent are also seems to be controlled from "p" to "f" and no any notes sounds too loud.

Of course, there are also some disputes. Li xue mei had mentioned the extent of dynamic in her research, she believes that considered the tone colour and character of harpsichord and clavichord, the dynamic of Baroque clavier music are "between pp to mf" [18]. Nevertheless, according to the history about the invention of fortepiano, which was called "gravicembalo col piano e forte", which combine the advantages of harpsichord and clavichord: can do some crescendo and diminuendo, and the name also can shows the extent of dynamic: piano and forte. So choose the extent of dynamic changes from p to mf maybe more appropriate.

5.3 How to use the trend of dynamic changes in Bach's music: when play J.S.Bach's Sinfonia in A major (BWV 798) on modern piano.

This research had compare the literature in above paragraphs, From the above paragraphs had mentioned, even some musical researchers and pianists are agree with restore or imitate the Baroque clavier tone colour, it seems there are still many musical researchers and pianists are agree with Under the premise of retain the Baroque perform style to do some dynamic changes. For example, Rosalyn Tureck (1914-2003) had mentioned that "To put Bach's new understanding into practice, we need to create a new set of playing skills" to "make Bach's music live on the piano in its proper way, and free it from the piano treatment in the 19th century" [16]. She claimed that we should not be biased towards any kind of musical instrument and should not be superstitious about any kind of timbre, and she believes

that different performer can make different hand notes to the original score (subjective understanding) [16].

Rosalyn Tureck's opinion had been supported by many other researchers and pianists, such as Richard Good and Alfred Brendel, which had been mentioned in the above paragraphs, especially Richard Good, he said that "People can't have a pair of 18th century ears in the present", "The ideal state is to live in the music from the heart, not from the surface, but through your own feelings." [16]. Which means that how to use dynamic changes in Bach's music on modern piano performing not only needs to feel the music by performer themselves, but also they need to analysis the music and even understand the music by the analysis.

From above paragraphs had discussed that the crescendo and diminuendo can be use in Bach's music when perform on modern piano, but it had not discuss how to use crescendo and diminuendo appropriately in Bach's music. So from this paragraph, this research will discuss how to use the the trend of dynamic changes when play J.S.Bach's Sinfonia in A major (BWV 798) on modern piano by contrast literature, scores and pianists perform audios.

5.3.1 Highlight the long notes

Highlight the long notes in the parts also had been used in many performance, such as Tatiana Nikolayev [11] and Yunchan Lim [15], which were discussed above. Leng Jia [19] had mentioned that when play Bach's polyphonic music on harpsichord, "Especially use the double keyboard harpsichord, can make the different parts melodies layers contrast sharply", and she believes that it is an "advantage", because she claimed that "at that time (Bach's time) play Bach's clavier music (on harpsichords) do not need to much more body movements and basically depends on fingers' touching", but now when we "use modern piano play Bach's music at present not only needs fingers touching but also needs to use body movement to control dynamic and tone colour" [19]. It seems that if the performers want to maintain the "advantage" of "make the different parts melodies layers contrast sharply", they have to adopt some measures.

So, highlight the long notes in the melody parts maybe can be an effective measure to make the different parts melodies layers contrast sharply, not only in order to reflect the direction of the melody line better, but also maintain the performance way in Baroque style.

5.3.2 According to the trend of melodies to choose the trend of dynamic changes

Bach's music works are typically Baroque polyphonic music, and the Sinfonia in A major (BWV 798) also a three-voice polyphonic music, which means this piece was combined with three different melodies. These melodies' notes have different trends. Chen en en had concluded that It is necessary to appropriately use the dynamics and the contrast between light and dark timbre according to specific musical factors [1].

These kinds of situations are also appear in these six pianists performance. According to the previous analysis, which has mentioned that Tatiana Nikolayeva had used three different ways in three voice, which had been shown In the previous analysis, and the most obvious characteristics is every voice dynamic changes are according to the tendency of melodies' rise or fall: when the melodies' note shows a rise tendency, she will use crescendo to perform. If the melodies' note shows a fall tendency, and she will use diminuendo in her perform.

Zhu Xiao-Mei [14]'s perform method are different from Tatiana Nikolayeva [11], in the previous analysis, she prefer to use crescendo in 10th-12th bar. However, according to the audio sound, although not quite obvious, it still can recognize that when she play these three bar have "bright and dark" tone colour contrast: when she play the top voice, the melody will sound "bright" and louder. Conversely, when she play the baritone voice, the melody will sound "dark" and overcast.

6 Conclusion

This research had analysed the dynamic of J.S.Bach's Sinfonia in A major (BWV 798) by compare dynamic marks in different scores and discussion in different literature, contrast and discuss six pianists performing by analysis their performing audio sound and waveform, and finally concluded that:

Firstly, when play Bach's period (Baroque) music work on piano, it seems can use "crescendo and diminuendo" limited, the extent of dynamic can be better to control from p to f.

Secondly, it seems that can adopt to highlight the long notes in melodies to help the different voices melodies contrast more obviously, which may helpful for keep the character of Baroque music style as much as possible

Finally, choose appropriate dynamic changes in perform by analysis melodies' trend may can be useful, not only to contrast dynamic, but also may helpful to precipitate the contrast of tone colour "bright and dark".

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