

PIANISTS INTERPRETATIVE INTENTIONS IN EXPRESSIVE PERFORMANCE

Eun-Ju Jung

University of Sheffield, UK

ABSTRACT

Background. A large body of previous research has established the general principles of expression in piano performance. However, the variations of the expressive features in music performance need to be investigated in relation to performers' interpretative intentions.

Aims. This study investigated the relationship between a performer's interpretative intention and his/her own performance of a piece of music. The main purposes were to investigate whether music performers' interpretations are differed from one another in a piece of music, and whether the interpretative intentions of a performer in the music correspond to his/her own performance.

Method. Three experienced pianists were given a short music piece in which all expressive markings had been deliberately removed. The pianists were asked to interpret the music by indicating expressive markings on the music score, and perform it on a Disklavier piano. The MIDI data from the recorded performances were analysed in terms of two features of expressive performance: inter-onset timing and dynamics. The expressive markings indicated in the score by the pianists were converted into a numeric form based on a quantification model that relates graphical symbols in the score to timing and dynamic values.

Results. Significant interactions between the individuals and their performances were observed indicating that the pianists' performances were significantly different from one another. For the timing data, each pianist's performance showed positive correlations with his/her interpretation as well as with the other pianists' interpretations, and for the dynamic data, each pianist showed more positive correlations with his/her own interpretation than with the others' interpretations.

Conclusions. These results demonstrate that the expressive characteristics of a performance relate strongly to the conscious interpretative intentions of performers, but that performers do not have complete awareness of their own expressive strategies.

contour, phrasing, tempo changes, and dynamics. Shaffer's study (1992) also showed variety in individual performers' interpretations as well as consistency in performances of one interpretation. Expressive markings were emphasised as a channel to 'crystallise (p.273)' performers' expressive decisions and their understanding in music structure. These studies provided the possibility to investigate rather ambiguous interpretative intentions in empirical research by studying the relationship between expressive markings and MIDI data from performance. Nevertheless, the expressive markings were too subjective to be scientifically analysed, and analyses in the MIDI data occupied the main stream of the studies. In other words, it was always the recorded music itself which was closely investigated. None of the previous studies have investigated differences and similarities in individuals' interpretations, or the relationship between interpretative intentions and the MIDI data for a whole piece of music. The present experiment, therefore, aims to expand the boundary of investigation by bringing performers' interpretative intentions into empirical studies of expressive performance.

The initial questions occurred in reviewing previous studies; First, when performers are asked to play a piece of music with their own interpretation in terms of tempo, dynamics, and emotions, will their performances be different from one another? If so, how much will they vary from one performance to another? Second, when a performance is compared with the expressive markings (interpretative intention) written on the music score by the performer, will the performance and the expressive markings correspond to each other in terms of timing and dynamics?

According to Shaffer's study (1992), when performers encounter a piece of music completely unknown to them and stripped of any expressive markings, different individuals' performances will be different from one another since expressive markings written in a music score clarify the whole idea of the music. If so, expressive performances conveying an individual's interpretative intentions will correspond with his/her own interpretation more than with others' interpretation since different ideas in music structure cause differences in the characteristics of expressive performance including rubato patterns, tempo changes, and dynamics (Palmer, 1989).

1. INSTRUCTION

Experimental studies to bring performers' interpretation directly into the domain of expressive performance can be found in a few experimental attempts (e.g., Palmer 1989; Shaffer 1992). The second experiment in Palmer's study (1989) was designed to investigate the relationship between timing patterns in piano performance and the performer's interpretation in music structure. Chord asynchronies, rubato patterns and overlaps in a pianist's performances corresponded with his/her own interpretation more than with other pianists' interpretation in terms of melodic

2. EXPERIMENT

2.1. Method

Material. Generally performers, in real, are not given entire authority to interpret a piece of music with their own interpretive decisions since the details of expressive indications including initial tempo, dynamics, and phrasing are already written in the music score. Since performers could only vary expressivity of the music on the basis of what is written in the music score, the

differences in individuals' performances may not be measurable in the relation to the performers' interpretative intentions. Therefore, it was decided to remove all of the expressive markings in the music score to allow the performers to interpret the music as they prefer, and, thus, to increase the capability to investigate individual differences in music interpretation.

As a material piece, one of *Fünf kleine Klavierstücke* by Franz Liszt apparently satisfied three criteria similar to Shaffer's criteria (1992, p.266); First, it had short length (25 bars); Secondly, it was easy to play so that the technicality in the music was expected to be overcome in a short period of practising; Finally, although the musical structure is obvious and simple (A-B-A'), it had some characteristics including relatively long pauses, rather constant rhythms and simple melodic contours, which could generate diversity in interpretations/expressions. All expressive markings including tempo, dynamics, indications like *ritardando* or *a tempo*, slurs and accents were deliberately removed from the music leaving the musical notes and the key signature only.

Participants. 3 piano players in postgraduate levels or more have participated in the experiment. Two of them (Pianist1 and Pianist3) were very experienced piano teachers with certain knowledge of Romantic piece of music. One of them (Pianist2) was a composer with plenty of experience in piano performance.

2.2 Procedure

Practice Session. The pianists were given the music sheet in which all the expressive markings had been removed, and the instruction sheets containing the exact examples of expressive markings. During one week of the practice period, the pianists prepared to perform the music without technical mistakes, and interpreted the music in their own ways. The pianists were asked to indicate any details of their own expressive intentions using the examples of expressive markings presented in the instruction sheets.

Recording Session. The pianists came back to record their performance after one week of practice. The pianists were asked to play the music on a Disklavier, and their performances were recorded using Protools LE software. The recording session was held in a sound studio in the music department at the university of Sheffield, and the experimenter attended to operate the software and to record the whole recording session using a MiniDisk recorder.

The aim of the recording session was to gather at least three performances with which the pianist was satisfied for each performer. After each performance was completed, the experimenter asked the pianist if he/she had been satisfied with the performance until there were at least three satisfying performances. This nomination was aimed to gather enough data to generalise each individual's performance for statistical analyses. The pianists played the music between four to eight times until they had three satisfying performances. Finally, each pianist was asked to nominate one performance that he/she thought was the best of the three. The best performances were also compared with what was indicated in the music score by the performers. The MIDI data from the recorded performances were then filtered using POCO software.

2.3. Analysis

Analysis of the MIDI data. Various empirical studies have focused on three principal features in expressive performance. These expressive features are (1) rubato pattern (inter-onset timing pattern), (2) dynamics, and (3) voice leading. In this study, the MIDI data from the recorded performances were analysed in terms of two features of expressive performance: inter-onset timing and velocity. The patterns of inter-onset timing represent the rhythmic contour of the recorded music, and the velocity data represent the dynamic changes as the music unfolded.

Nine recordings (three recordings nominated by each pianist) were processed using POCO software to establish the rhythmic contour of the music. 74 inter-onset time values were filtered through POCO to represent the 74 rhythmic notes (attack points) of the music apart from the last note (the last note does only have its onset time). The mean of note velocities in each rhythmic units was calculated to represent the loudness (dynamics) of the 75 notes (this time, the last note was included in the analysis). Figures 1 and 2 show the patterns of inter-onset timing and dynamics in each pianist's average performance.

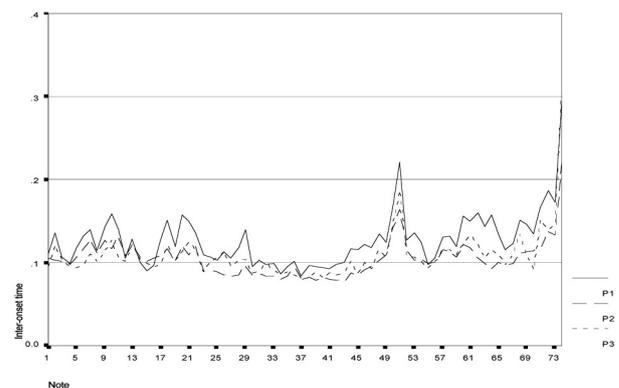


Figure 1. Inter-onset timing patterns in the pianists average performances. Each inter-onset timing represents the duration of a quarter.

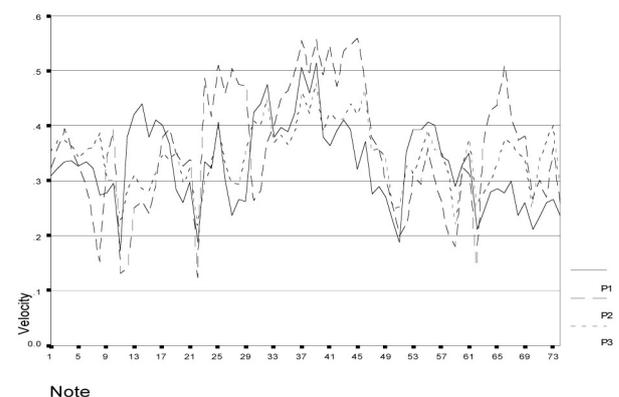


Figure 2. Dynamics patterns in the pianists average performance. Each velocity value represents the mean velocity of each rhythmic unit.

Analysis of the pianists annotation. The pianists produced their initial tempo decision, phrasing, pedalling, dynamics, and rubato patterns in the score, using the examples of expressive indications shown in the instruction sheet. These expressive markings were converted into a numeric form based on a quantification model that relates graphical symbols in the score to timing and dynamic values. This attempt was made to convert the pianists interpretative intentions into quantitative measurement in order to directly relate the MIDI data to performers interpretations, and to investigate whether significant interactions appear between a performer s interpretation and his or her expressive performance in a piece of music.

First all of the expressive markings were divided into two categories. The first category, **Rubato**, captures timing properties among the expressive markings including a tempo, ritardando, accelerando, fermata, staccato and tenuto. The second category, **Dynamics**, includes dynamics properties including pianissimo, piano, mezzo piano, mezzo forte, forte, fortissimo, crescendo, diminuendo, and accents. Secondly, every single note was given a value regarding the expressive markings associated with the note. Table 1 shows a few principles of quantification. According to these principles, every single note was eventually given a value, and the expressive markings were converted into quantitative measurement for further analyses. Meanwhile, it should be emphasised that these values were arrived at speculatively and intuitively. They do not represent any physical scales or correspond to theoretical hierarchies. A value only discriminates one note from its neighbours in relations to timing and dynamics as marked in the music score.

Rubato	Value	Dynamics	Value
<i>a tempo</i>	1 for all notes without any timing changes	<i>pp</i>	1
		<i>p</i>	2
<i>accelerando</i>	0.2 or 0.5 omitted from the value of the preceding notes while an accelerando continues.	<i>mp</i>	3
		<i>mf</i>	4
		<i>f</i>	5
		<i>ff</i>	6
<i>ritardando</i>	0.2 or 0.5 added to the value of the preceding notes while a retardando continues.	<i>accent</i>	0.5 or 1 added to the value or the accented note.
<i>Fermata</i>	3 for the lengthened note.	<i>crescendo</i>	0.2 or 0.5 added to the value of the preceding notes while a crescendo continues.

Table 1. The examples of quantification principles

Statistical Analysis. Series of statistical tests were carried out using SPSS software in order to examine the relationship between the MIDI data and the quantitatively converted expressive decisions in the music. First, a two-way ANOVA tested the significance of the interaction between the individual pianists and the patterns of inter-onset timing and dynamics in the recorded performances. Secondly, the correlations were tested in relation to the relationship between the interpretative decisions (Rubato and Dynamics) of the pianists and the patterns of inter-onset timing and dynamics in their performances.

2.4. Results

Interaction between the performers and the expressive features. As shown in Figures 1 and 2, the patterns of inter-onset timing and dynamics varied from one pianist to another. In the inter-onset timing patterns, although the pianists generally agreed on where to change the timing patterns, each individual appeared to have different ideas in the degrees of timing changes. In dynamics patterns, the choices of dynamics change were less similar than in the inter-onset timing patterns. The individual pianists appeared to have their own interpretation in dynamics different from one another.

These interactions between the pianists and the variations in inter-onset timing and dynamics were examined using a two-way ANOVA test. The results show that there were significant inter-performer related effects in both inter-onset timing ($F=5.603$, $df=146$, $p<0.001$), and dynamics ($F=12.808$, $df=148$, $p<0.001$). This indicates that the inter-onset and dynamics patterns in a pianist s performance were discriminated from those patterns in the other pianists performance. The fact that the interaction between the pianists and the dynamics was stronger than between the individuals and the inter-onset timing patterns indicates that the performers made more variable interpretative decisions in dynamics than in timing changes in the music.

The relationship between the variations in inter-onset timing and in dynamics. The patterns of inter-onset timing and dynamics in each individual s performances were correlated to examine the relationship between the changes in inter-onset timing and dynamics. The correlations in each pianist s timing and dynamics variations showed the most negative correlations in his/her own performance (Pianist 1 ($r=-0.626$, $N=74$, $p<0.001$); Pianist 2 ($r=-0.599$, $N=74$, $p<0.001$)) apart from Pianist 3 ($r=-0.340$, $N=74$, $p=0.003$). This indicates that when the pianists make changes in the timing patterns, they also tend to change the dynamics while playing the music. For example, while the music is slowing down, it tends to be louder.

The relationship between the pianists interpretations and the expressive performance. Series of correlation tests were carried out between the quantified interpretative decisions of each pianist and his or her own performance to examine if the individuals own performances convey their own interpretative intentions about how the music should be played. Each pianist s Rubato patterns were correlated with the inter-onset timing variations in his or her own performances, and the individuals Dynamics patterns were correlated with the dynamics variations in their own performances. Table 2 shows the correlations between the interpretative intentions and the performance in each individual pianist. All of the correlations were significant at the 0.01 level.

	Rubato vs. inter-onset timing patterns	Dynamics vs. dynamics patterns
Pianist1	0.479 ^(a)	0.420
Pianist2	0.556	0.626
Pianist3	0.661	0.309

(a) The numbers represent Pearson's r ($p < 0.01$, 2-tailed)

Table 2. The correlations between interpretative decisions and expressive performance

These results indicate that the pianists' interpretative intentions were conveyed in their expressive performances in two expressive features (Inter-onset timing and dynamics). Therefore, one can expect that individual decisions in interpreting the piece of music alter the ways of performing the music, and that the differences in these interpretative intentions deliver various ways of expressive performance different from one performer to another.

3. DISCUSSION AND CONCLUSION

These results demonstrate that the pianists interpret a piece of music with their own interpretation in terms of tempo and dynamics when the music score contains fewer details of expressive markings. The pianists were not given any information about the style or structure of the music. However, their descriptions about the music suggest that the pianists were somehow aware of the general structure (A-B-A) of the music, and recognised the period of the music piece by examining the harmonic contour in the music. This awareness was not analytical or academic since they did not analyse the music in the same way as musicologists or analysts would do. This sketchy understanding about the piece of music may have been formed on the pianists' experience in performing Romantic music pieces. Despite of the similar understanding about the style and structure of the music, the pianists delivered different ways of expressive performance different from one another. The two-way ANOVA tests showed their performances were significantly different from one another in timing and dynamics patterns.

The results also show that the variations in the pianists' expressive performance correspond with their own interpretative decisions in the music. This indicates that an expressive performance conveys the performer's own interpretation in a piece of music. To add expressive characteristics in the music, the performers tend to change the patterns of timing and dynamics as the music is unfolded. As suggested in Repp's studies (e.g., Repp, 1992), the diversity of timings, dynamics, and tempi at certain locations in the music differentiates expressivity in music performance. In this experiment, it was obvious that the pianists' performances represent their interpretation of a piece of music, and convey the changes in timing and dynamics patterns as the performers initially intended.

As mentioned earlier, this experiment aimed to relate characteristics of expressive performance to performers' interpretation, unlike previous studies in which the variations of expressive properties in music performance were investigated

in its relationship with the musical structures (e.g., Palmer, 1989 and 1996; Clarke, 1985; Shaffer and Todd, 1987). Deciding whether the interpretative decisions made by the pianists in this experiment actually represent any hierarchies in the structures of the piece of music requires further investigations. As Palmer has suggested in her studies, the variations in expressive properties including timing and voice leading may be located at structural boundaries such as phrases or articulation boundaries.

Meanwhile, one may ask that which of the three pianists have delivered the most convincing interpretation in the piece of music. There has been a general notion in the field of music analysis and performance that an analytical interpretation in a piece of music is superior to its performance so that the performer should fulfil the analytical information in his or her performance of the music. However, as Lester (1995) claimed, a performance of a piece of music is one of many options in interpreting the music, and, therefore, performances are just different from one another rather than one is correct and another wrong. In this experiment, some of the pianists may have delivered more convincing interpretation than the others in an analytical sense. However, their performances, in general, were faithful to their own interpretative intentions, and the variations in expressive performance should be investigated more in relation with performers' interpretative intentions in order to establish the role of interpretation affecting the characteristics of expressive performance.

4. REFERENCES

1. Clarke, E. F. (1985). Some aspects of rhythm and expression in performances of Eric Satie's 'Gnossienne No. 5'. *Music Perception*, **2**, 229-328.
2. Palmer, C. (1989). Mapping musical thought to musical performance. *Journal of Experimental Psychology: Human Perception and Performance*, **15**, 331-346.
3. Palmer, C. (1996). Anatomy of a performance: Sources of musical expression. *Music Perception*, **13**(3), 433-453.
4. Repp, B. H. (1992). Diversity and commonality in music performance: An analysis of timing microstructure in Schumann's "Träumerei." *Journal of the Acoustical Society of America*, **92**, 2546-2568.
5. Shaffer, L. H. (1992). How to interpret music. In M. R. Jones & S. Holleran (Eds.), *Cognitive Bases of Musical Communication* (pp. 263-278). Washington, DC: American Psychological Association.
6. Shaffer, L. H., & Todd, N. P. (1987). The interpretive component in musical performance. In A. Gabriellson (Ed.) *Action and Perception in rhythm and music* (pp. 139-153) Stockholm: Publications issued by the Royal Swedish Academy of Music, No.55.