

Performance Variables for Grouping Structure in two editions of the theme of K. 331

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Abstract

I studied how performance variables are used to express musical grouping structure. Concerning the theme of Mozart's piano sonata k.331, there are two typical editions of which the grouping structures are different. Lerdahl and Jackendoff have stated some performance rules that express different grouping structures of this theme. By studying the performances of different grouping structures of this theme, I found a change in dynamics rather than a change in tempo affects its expression.

1 Introduction

How does a pianist express his/her musical interpretation during a performance? Using objective analysis, I studied various musical performances of Mozart's piano sonata in A major (k.331). As for this theme, there are two typical editions, the Henle edition and the Peters edition. The Henle edition is a new urtext version, while the Peters edition had been edited by Louis Köhler and Adolf Ruthardt. The most remarkable difference between these two editions is the grouping structure of the theme as analyzed by Meyer (Meyer 1973).



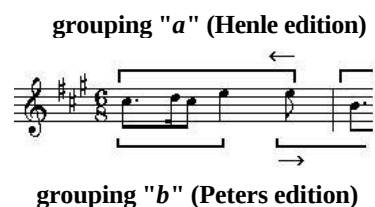
Example 1a: Henle edition (grouping "a")



Example 1b: Peters edition (grouping "b")

Example 1 shows the grouping structures of the two editions. (The brackets below the music sheets indicate the grouping structures.)

Lerdahl and Jackendoff have expressed the following opinions about performance expression and music structure of this theme in "GTTM" (Lerdahl and Jackendoff 1983). They say "the perception of grouping is one of the more important variables the performer can manipulate in projecting a particular conception of a piece." They go on to say "a less noticeable alteration the performer may make is a slight shift in the attack point of the eighth, playing it a little early for grouping *a* and a little late for grouping *b*." Example 2 shows the slight shift in the attack point on the eighth note.



Example 2: slight shifts in the attack point
on the eighth note

I have researched the performance variables of this theme in these two editions.

2 Method of analysis

First, four pianists each played the first eight measures of the theme in both these editions on Yamaha Piano Player. I then analyzed the variables of their individual expression by comparing the data in terms of variations in tempo and dynamics.

Dynamics is determined by the velocity values, and tempo is expressed as the metronomic tempo. The target notes were the melody notes of the theme.

3 Results and Discussion

3.1 Change in Tempo

According to GTTM's definitions, in the Henle edition, the attack point on the 6th beat in the 1st measure is played slightly early. As a result, the 6th beat will be played at a slower tempo than the preceding note. On the other hand, in the Peters edition, if the attack point on the 6th beat is played slightly late, the duration will be shorter and the 6th beat will be played at a quicker tempo than the preceding note. In this theme, there is the same rhythmic pattern in the 1st, 2nd, 5th, and 6th measures.

I analyzed the performance data of the four pianists playing both editions by comparing them against this definition. (data for tempo is in Appendix 1.) I found that of the 32 performed measures, 12 of the Henle edition were played consistent to the definition, but only 5 of the Peters edition were.

In the Henle edition, since the 6th beat in the 1st measure is the last note of the group, it would be suitable from the viewpoint of music performance for the tempo to become slower than the preceding note. However, in the Peters edition, there were many results that were not consistent with the definition that the 6th beat is played at a quicker tempo than the preceding note.

As a result, about the attack point, it was not possible to completely verify the definitions for the performance of these two editions. How did each of the pianists then express the differences in the grouping structures?

3.2 Change in Dynamics

Next, let us look at the change in dynamics. Meyer has expressed the following opinion regarding the stress (Meyer 1960). "In general it appears that stress, whether on a weak or strong beat, tends to mark the beginning of a group."

In these performances, clear similarities in dynamics are noted regarding the first and the last note of the groups in these two editions. Figure 1 shows a list of the velocity values for the performances of the four pianists. Additional data and a graph are given in Appendixes 2 and 3.

For example, in the Peters edition, the first note of the group is the 6th beat of the 1st measure and this note is the weakest beat in the measure. The dynamics data indicate that all the pianists played the first note of the group louder than the last note of the preceding group. Also, in the Henle edition, the first note of the group is the 1st beat of the 2nd measure, and in this case, the dynamics data indicate that everyone played the first note of the group louder than the last note of the preceding group.

Also, this tendency is found in all data of dynamics on the same rhythmic patterns, and even if

the edition is different, this tendency is unchanged.

Thus, my results are consistent with Meyer's opinion.

Velocity Values (dynamics)

k.331 Henle edition

Grouping	last note	first note
target note	6th beat in 1st measure	1st beat in 2nd measure
Pianist K	46	62
Pianist F	45	51
Pianist T	46	52
Pianist A	39	45

k.331 Peters edition

Grouping	last note	first note
target note	4th beat in 1st measure	6th beat in 1st measure
Pianist K	56	69
Pianist F	48	59
Pianist T	46	58
Pianist A	37	48

Figure 1. Dynamics (velocity value)

4 Conclusion

Through my research, I have clarified that it is the change in dynamics rather than the change in tempo that affects the statement of the beginning and closing of a group. This result is useful for musical education and application of a performance rendering system.

However, the changes in dynamics and tempo are inseparably related to each other, so the individual expression of grouping structures in a musical performance should be determined by their interaction. Further analysis is needed to examine other musical pieces within a range of music styles.

References

- Meyer, L. 1973. "Explaining Music." University of California Press:26-43
- Lerdahl and Jackendoff. 1983. "A Generative Theory of Tonal Music." MIT Press:63-64
- Cooper, G. Meyer, L. 1960. "The Rhythmic Structure of Music." University of Chicago Press:8
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Appendix

Data for Tempo and Dynamics

1 Tempo (metronomic tempo)

k.331 Henle edition

target note	4th beat in 1st m.	6th beat in 1st m.	4th beat in 2nd m.	6th beat in 2nd m.	4th beat in 5th m.	6th beat in 5th m.	4th beat in 6th m.	6th beat in 6th m.
pianist K	112.7	93.8	111.1	92.4	125.3	115.2	109.6	92.9
pianist F	104.3	83.3	101.5	100.8	105.3	84.7	107.0	100.2
pianist T	86.1	81.9	81.1	83.0	100.6	63.1	72.6	78.1
pianist A	96.7	75.8	88.2	95.8	88.6	78.6	99.0	99.3

k.331 Peters edition

target note	4th beat in 1st m.	6th beat in 1st m.	4th beat in 2nd m.	6th beat in 2nd m.	4th beat in 5th m.	6th beat in 5th m.	4th beat in 6th m.	6th beat in 6th m.
pianist K	109.6	87.6	96.5	86.8	104.2	86.8	109.3	85.7
pianist F	96.9	67.8	97.9	80.0	94.4	67.6	85.8	66.9
pianist T	81.4	81.9	75.2	81.9	68.2	82.2	75.5	83.9
pianist A	86.0	100.2	131.0	98.8	112.7	86.5	102.6	100.3

2 Dynamics (velocity value)

k.331 Henle edition

Grouping	last note	first note	last note	first note	last note	first note	last note	first note
target note	6th beat in 1st m.	1st beat in 2nd m.	6th beat in 2nd m.	1st beat in 3rd m.	6th beat in 5th m.	1st beat in 6th m.	6th beat in 6th m.	1st beat in 7th m.
pianist K	46	62	52	60	49	59	50	60
pianist F	45	51	43	51	42	55	46	54
pianist T	46	52	39	52	51	53	42	52
pianist A	39	45	42	54	45	52	44	58

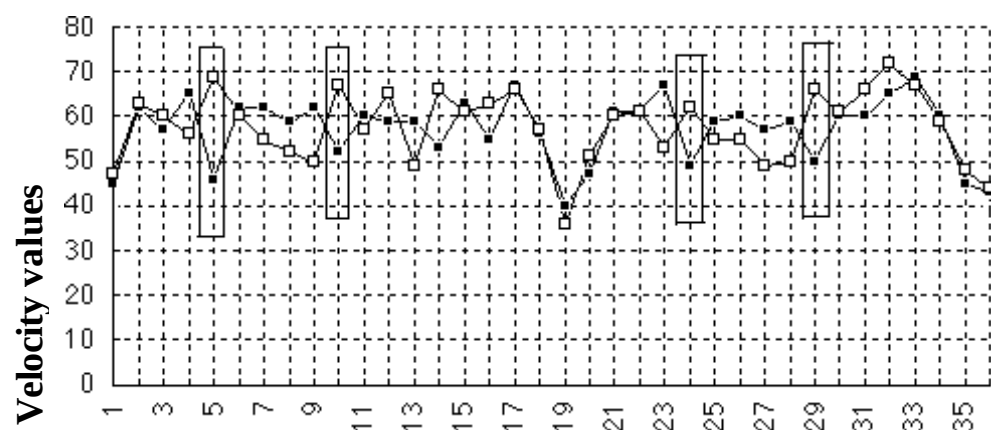
k.331 Peters edition

Grouping	last note	first note	last note	first note	last note	first note	last note	first note
target note	4th beat in 1st m.	6th beat in 1st m.	4th beat in 2nd m.	6th beat in 2nd m.	4th beat in 5th m.	6th beat in 5th m.	4th beat in 6th m.	6th beat in 6th m.
pianist K	56	69	50	67	53	62	50	66
pianist F	48	59	40	59	50	59	43	59
pianist T	46	58	42	51	44	57	46	57
pianist A	37	48	44	51	41	52	46	55

Appendix

3 Graph of Velocity values (Change in Dynamics)

k.331 pianist :K □ :Peters edition ■ :Henle edition



Notes

Square marks (□, ■) in rectangle box indicate the 6th beat in the 1st, 2nd, 5th, and 6th measures.