PERCEPTUAL SALIENCE OF GROUPING STRUCTURE BY VARIOUS PERFORMERS OF "LA TERRASSE DES AUDIENCES DU CLAIR DE LUNE" BY DEBUSSY

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ABSTRACT

Debussy's "La terrasse des audiences du clair de lune" is a piece that permits multiple interpretations with respect to grouping structure and climax. Performers of this work have considerable freedom to shape a listener's perception of grouping structure and arrival based on a number of plausible structural interpretations.

The purpose of this investigation is to examine listeners' perception of structural salience, in terms of phrasing, near moments in the piece that are open to multivalent interpretations. The focus is on whether the piece was viewed as bipartite or tripartite, and how this relates to the perception of arrival or delay in reaching points of climax. The researcher considered interpretive choices available to performers, how performers shape significant moments in the piece particularly with respect to dynamics and timing, and how listeners perceive emphases made by different pianists.

Two experiments were carried out. In the first experiment, music graduate students listened to the entire piece, then to an excerpt performed by three different recording artists. Subjects evaluated the strength of grouping emphasis at predetermined grouping boundaries. In the second experiment, subjects studied a specific recorded performance during an initial conditioning period. They then listened to an expressionless reproduction of an excerpt, and indicated moments most in need of musical expression for the phrasing to be communicated.

The results of the first experiment show that listeners respond most readily to dynamics, tempo, and articulation as performers' indicators of structural salience. In the second experiment, certain boundaries showed differences in perception, while others were perceived similarly.

In a piece with open-ended interpretive possibilities, particularly with respect to grouping structure and climax, performers may have significant influence over the perceived architecture of the piece. Certain places may be more open to interpretive possibilities by the performer, whereas section or phrase boundaries in other spots may reflect less malleable structural features of the work. This study shows that perceptual studies in conjunction with music analyses may uncover possibilities for expressive performance of structurally ambiguous works.

1. BACKGROUND

When pieces depart significantly from standard musical forms a performer faces a host of interpretive possibilities, some of which relate to form. In what ways can a performer communicate an interpretation of large-scale grouping structure, or emphasize different climactic moments, or places of arrival? How can performers clarify ambiguity of formal structure through performance? The Prelude, "la terrasse des audiences du clair de lune" by Debussy may illustrate such possibilities.

Two analytic interpretations of this piece's form appear plausible, bipartite and tripartite. Some see tripartite structure in the work (Mesnage, 1989). Approximately two-thirds of the way through the piece, the passage in bars 25 to 27 suggest a tonal center of Eb major. Considering the pedal point profile of the entire piece, the Eb passage may be a place of tonal arrival (Table 1). The beginning of the second section has a pedal tone Bb, foreshadowing the Eb passage as the dominant of Eb. In addition, the Eb passage appears approximately halfway through the second section.

First section Bars 1-9	Second section Bars 10-36		Third section Bars 37-45
	• *Arrival* • Bars 25-27 • Eb major passage		
Pedal point C#	Pedal points Bb (C#) Eb	G	Pedal point F#

Table 1: This diagram of tripartite form shows the Eb passage appearing approximately halfway through the second section. The pedal point Bb in bar 10 foreshadows the arrival of Eb, bars 25-27, as the dominant of Eb.

On the other hand, this passage could be considered a detour within a bipartite design (Table 2). A structural arrival in the second part occurs near the golden section of the piece at bars 31-32. At this point previous motivic material reappears, specifically melodic material from measures 13 and 14. From this stance, the Eb passage delays the build-up of a dynamic climax near measures 28 to 31 and the arrival of the second section marked by the return of motivic material at measure 32. The motive appears central to the structure in this prelude (Forte, 1989). In this light, the beginning of the dynamic build-up at measure 20 coincides with the golden section of the first large section. The return of motivic material at measure 32 marks the beginning of the second section, corresponding to the golden mean of the entire piece. In this case the Eb passage may be minimized as the point of arrival, and conceived rather as a detour.

First section Bars 1-27	Second section Bars 28-45
• *Detour* • Bars 25-27 • Eb major passage	Bars 31-32, approximately the golden mean for the entire piece. Bars 31-32, return of motivic material.

Table 2: In a bipartite design, the Eb passage may be a detour, delaying the structural arrival at bar 32 along with the return of motivic material.

The main question of this study is the way in which performers clarify important structural moments, resolving potential ambiguities. This study approaches this issue through two experiments. The first experiment considers how listeners perceive expression that has been added by performers. The second experiment considers how listeners' perception of form may be influenced by a particular recorded performance.

Through tempo and dynamic variations, the performer has tools with which to communicate musical structure. The slowing of tempo and changing of dynamics in the appropriate musical context often indicate phrase endings or sections (Repp, 1992; Repp, 1995). As noted previously, performers use rubato or subtle variations in timing to convey musical structure (Shaffer and Todd, 1994; Shaffer, 1995).

However, the degree to which pieces may be interpreted by a performer to influence different understandings by a listener may vary significantly. The *Prelude* chosen for this study provides excellent ground for investigating these issues.

2. PURPOSE AND AIMS

The two experiments outlined here hoped to uncover ways in which different performers communicate interpretation of phrasing or form. The first experiment sought to understand how listeners discern the strength of salient structural moments in listening to expressive performances. The hypothesis was that listeners would use dynamic and timing expressive cues to determine the strength of phrase boundaries.

The second experiment sought to investigate how much listeners' long-term concept of a piece would be molded by listening to an expressive recorded performance. The expected results were that listeners would fasten on certain locations as needing expression for proper phrasing to be communicated, based upon conditioning to a particular recording. These places would be indicated while listening to an expressionless, computer-generated recording of the work.

3. METHODS

3.1. Subjects

Subjects were music graduate students or professional musicians. Within the field of music, individual specialties of the subjects ranged from performance, to conducting, music theory, music history, composition, and music technology.

Four subjects participated in the first experiment, and three subjects have participated in the second experiment to date; more data is being collected and analyzed at the time of this writing.

3.2. Music

The musical selection was the *Prelude* for piano by Claude Debussy, "la terrasse des audiences du clair de lune". In the first experiment, four different recordings were used which included performances by Peter Frankl, Walter Gieseking, Krystian Zimerman, and George Copeland.

The expressionless MIDI reproduction used in the second experiment was created using *Sibelius* notation software. This reproduction was devoid of expressive timing and dynamics.

3.3. Equipment

Experiment One. Subjects listened to the digitally-recorded piece and excerpts in a quiet environment, over Alesis point 7 speakers. Presentation of the sound and visual cues for phrase boundaries were made via a Macintosh iBook computer. Responses and interviews were recorded onto a DAT recorder for later transcription.

Experiment Two. Subjects listened to their designated performance on a CD player at home. During the experiment, subjects listened to an expressionless MIDI reproduction through headphones, using Sony Dynamic Stereo Headphones, MDR-7506 Professional. This version was played back on a laptop computer, using a high-quality General MIDI grand piano synthesis patch.

3.3. Procedure

Experiment One. All subjects listened to the entire recorded piece by one performer, Frankl. Then subjects listened to a passage performed by three different recorded artists in randomized order (Gieseking, Zimerman, Copeland). Subjects decided how different performers emphasized phrase boundaries with varying degrees of strength. Listeners ranked strength of emphasis at four predetermined phrase boundaries (weak-1, somewhat weak-2, somewhat strong-3, and strong-4). These proposed boundaries were signaled visually while the subjects listened to the passage on a computer screen displaying a visual box which changed color from black to white at the proposed phrase boundaries. After each trial, subjects described their observations in a brief interview, and were asked what clues were used to make these decisions.

Experiment Two. In the second experiment, the question was whether or not listeners could be influenced by a performer's interpretation of grouping structure. Subjects listened to either a recording of Gieseking or Zimerman over the course of three days prior to the experiment. They listened to the recording a minimum of three times each day. To ensure that subjects attentively focused on the recordings, subjects created phrase maps of the piece that indicated the largest sections and subsections of the piece. Each section or subsection was indicated by the time-stamp from the recording. After the initial training period, the first task was to listen to an expressionless performance or a MIDI recording of an excerpt. Although this reproduction was devoid of expressive dynamics or rubato, the overall global tempo of the MIDI recording was calibrated to the overall global tempo of each performer. Subjects listened to the expressionless recording several times, as needed, while following a reduced score of the passage. The reduced score showed rhythmic cues only, with only the outermost voices written in drum notation. This was designed to minimize the influence that score notation may impart on the interpretation of a work. While listening to the MIDI recording, subjects indicated on the reduced score spots which most needed expression in order for the phrasing to be communicated clearly. They indicated the type of expression, either in terms of dynamics (e.g. crescendo, diminuendo, subito forte, subito piano) or timing (e.g. rallentando, accelerando). Subjects also indicated the amount of expression they preferred to hear (e.g. (1) very little, (2) somewhat little, (3) somewhat more, and (4) much more).

4. RESULTS

In the first experiment, subjects ranked perceived strength of phrase boundaries of the same passage from three different recordings. The average responses are shown in Table 3. Listeners perceived the strongest boundaries overall with the Zimerman recording. With the Gieseking recording, subjects perceived the strongest boundary at bars 31-32, and for the Copeland recording at bars 24-25 and 31-32.

In the brief interview conducted during the first experiment, subjects' responses conferred in two areas. When asked what musical clues most influenced their decisions on the perceived strength of boundaries, all subjects indicated that dynamics and tempo were influential clues. One subject also indicated change in articulation as another important factor. Second, when asked how much influence the performer has on communicating these phrase boundaries, all subjects indicated that the performer has great influence over this aspect, especially for a piece in which form and sections are less obvious.

In the second experiment, subjects were asked to create phrase maps during their conditioning period while listening to a specific recording. The phrase maps indicated the largest sections of the piece and the next smallest musical groups or subsections. The results show that subjects conferred in terms of section and subsection groupings for several spots (Table 4).

Artist	Gieseking	Zimerman	Copeland
Boundary: bars 24-25	2.3	3.8 † *	3.3 †
Boundary: bars 27-28	1.8	2.3	1.8
Boundary: bars 31-32	3.3 †	3.8 † *	3.3 †
Boundary: bars 36-37	1.8	3.5	3.0

Table 3: This table summarizes the average rating of perceived strength of boundary for three different recordings. The (*) indicates the strongest perceived boundaries among all recordings. The (†) indicates strongest perceived boundaries for each recording. There were four ranks - weak-1, somewhat-2, somewhat strong-3, and strong-4.

Measures	Number of subjects indicating section boundary	Number of subjects indicating subsection boundary
7		3
10	3	
13		1
16	1	1
20		2
25		1
32	1	2
34		1
36		1
37	2	1
39	1	1
42		2

Table 4: This table shows section and subsection boundaries from the second experiment.

All subjects agreed on a section break at bar 10. All subjects agreed on a boundary at bars 32 and 37, whether on the section or subsection level. Furthermore, all subjects agreed on bar 7 as a subsection phrase boundary.

Also in the second experiment, subjects listened to a MIDI recording of the same passage that was heard in the first experiment. Subjects indicated the most important expressive

Measure	Subject A: Listened Gieseking	Subject B: Listened to Zimerman	Subject C: Listened to Zimerman
20			
21		Accel. (1) Cresc. (1)	
22		Accel (1) Cresc. (1)	
23	Cresc. (2)	Accel. (1) Cresc. (1)	Dim. (3) Rallen. (3)
24		Rallen. (4)	Dim. (3) Rallen. (3)
25	Cresc. (4)		
26	Cresc. (4)		
27	Cresc. (4)		Cresc. (2)
28	Cresc. (4) Accel. (4)		Cresc. (2)
29	Cresc. (4) Accel. (4)		Rallen. (1)
30	Cresc. (4) Accel. (4)	Cresc. (2)	Rallen. (1)
31	Cresc. (4) Accel. (4)	Rallen. (2)	Dim. (4) Rallen. (4)
32	Dim. (3)		
33	Dim. (3)		Dim. (1)
34	Dim. (3)		
35	Rallen. (3)		
36	Rallen. (3)	Cresc. (1) Rallen. (3)	Rallen. (2) Dim. (3)
37	Rallen. (3)	Rallen. (3)	Rallen. (2) Dim. (3)

Table 5: This table shows expressive devices subjects most preferred to hear during the expressionless reproduction. The numbers in parentheses indicate strength of expression from 1 to 4 (much less to much more). Expressive options included crescendo (cresc.), diminuendo (dim.), rallentando (rallen.), and accelerando (accel.).

devices that a performer would need to add in order for phrasing to be communicated. (Table 5) The results show that subjects indicated different interpretations. Subjects B and C listened to the Zimerman recording, and both indicated rallentando at bars 24 and 31. All subjects indicated a rallentando at measures 36 and 37.

5. DISCUSSION AND CONCLUSION

The results of the first experiment were as expected. Listeners indicated that dynamics and timing most influenced perception of grouping and strength of phrase boundaries. Furthermore, subjects indicated that these were aspects under the performer's control. Different performers emphasize phrase boundaries with varying strengths, as noted by the subjects.

The results of the second experiment show that in a piece with less obvious sections or form, the performer may have more options to shape the perception of musical structure. However, other large-scale boundaries may lie inherently in the musical structure, and may be less influenced by a performer's interpretation. It is too early to conclude whether the different expressive choices listeners made while hearing the expressionless reproduction were significantly influenced by the recording that subjects listened to during the conditioning period.

There are multiple performance possibilities to interpret a piece that is structurally ambiguous in terms of large-scale grouping structure. This study considered the relationship between music analysis, perception, and performance. Performers may disambiguate multiple structural interpretations through musical inflections under their control, such as dynamics and rubato.

6. REFERENCES

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