

Expressive timing: Martha Argerich plays Chopin's Prelude op. 28/4 in E minor

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This paper scrutinizes the temporal organization of Martha Argerich's interpretation of Chopin's Prelude op. 28/4 in E minor, recorded in 1975 for Deutsche Grammophon (DG 415 836-2). It proposes a method for extracting the timing of the attacks from the audio signal, it visualizes the data of bars 1-4, and maps Argerich's timing to Chopin's composition in a process of "inverse interpretation."

Keywords: microtiming; interpretation; piano; Martha Argerich; Frédéric Chopin

When Western art music is performed, microrhythmic organization often differs considerably from the notated rhythm of the score; these deviations can be referred to as "expressive timing" (Clarke 1999) and have been studied intensely in empirical rhythm research (see Pfliegerer 2006 for an overview). There has been a considerable amount of research concerning performance invariants in time organization; most of it analyzed performances of classical/romantic piano music on recordings. Several studies present evidence that performers tend to slow down at the end of a melodic phrase (e.g. Repp 1998, Clarke 1999) and that melody voices anticipate accompanying voices by a few milliseconds ("melody lead," e.g. Palmer 1989, Goebel 2001). Most conclusions endorse a general assumption in music performance research that expressive timing relates closely to structural features of a composition (e.g. Clarke 1988, Palmer 1996).

Against this background of invariant performance behavior, we would like to analyze one particular recording as an individual response to a composition: between 22-25 October 1975, Martha Argerich recorded Frédéric Chopin's Preludes op. 28 in Munich for Deutsche Grammophon (catalogue number DG 415 836-2). Our analysis in this paper concentrates on the temporal organization of the E minor Prelude op. 28/4, bars 1-4 (although meas-

urements for the whole piece have been made). It divides the fabric of the Prelude into two rhythmic layers: the solo voice in the right hand and the sequence of accompanying chords in the left hand each have their own rhythmic structure (see Figure 2) and are analyzed separately. Finally, the timing phenomena are related to the score in a speculative process of “inverse interpretation”: inspired by Timmers *et al.* (2000), we assume that there is a great number of possible ways to analyze the structure of a composition. We do not analyze the compositional structure first, and map it to the performance data later, but the other way around. We inspect the timing data and try to separate expected phenomena from Argerich’s individual approach. Then, the score of the piece is analyzed in order to find the properties that are highlighted by Argerich’s interpretation. This analysis is done strictly from a listener’s point of view: we are not trying to reconstruct Argerich’s thoughts or intentions. But we do try to articulate which sense or meaning we—as listeners—might discover in Argerich’s interpretation of Chopin’s piece.

MAIN CONTRIBUTION

Method

Our method to secure tone onset times seeks to meet two requirements: it must allow us to differentiate tone onsets in two separate rhythmic layers (solo voice and accompaniment), and the accuracy of the measurements must be within 10 ms. Our approach implies two steps. First, we marked the onsets roughly in a sonogram (window size=4410 samples, hop size=441 samples); this places the timing in a range of ± 20 ms near the attack time. Since the notes of the accompaniment chords are not necessarily struck at the same time, only the onset of the loudest note of each chord was measured. In a second step we adjusted the measurements with the help of filters and two loudness measurements: a narrow bandpass filter (bandwidth=100 Hz) was employed to isolate the fundamental tone (or, if necessary, one of the first partials) of a note; the delay caused by the filtering was compensated. Then, the behavior of two loudness measurements was interpreted in order to detect the precise timing of the onset. It was set to the moment when a fast peak level (window size=1 ms) overshoots an RMS level (27 ms) which reacts early but slowly to an energy surge. First tests with monophonic piano examples suggest that this method places the timing markers within a range of 2-12 ms after the physical onset; more systematic tests need yet to be conducted in order to evaluate this (rather conservative) estimate. All measurements and the visualizations of timing data in Figure 2 were made with the Lucerne Audio Recording Analyzer (software freely available at www.hslu.ch/lara).

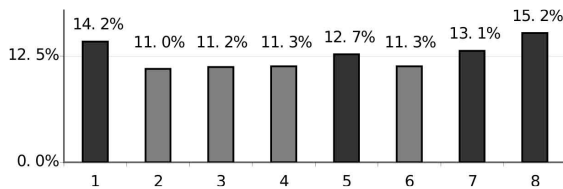


Figure 1. Average distribution of bar duration on the 8 eighth notes in the accompaniment in % (calculated with timing data from bars 1-11 and 13-22).

Analysis

In bars 1-11 and 13-22, the accompaniment of Chopin’s Prelude op. 28/4 consists of a rhythmically uniform sequence of chords, pulsating in eighth notes. Argerich plays these eighth notes with flexible rhythm; nevertheless, a general bar profile is discernible.

Figure 1 shows the mean distribution of bar durations among the 8 eighth notes of a bar throughout the whole piece (in % of bar duration). Two ritardando zones can be identified: one strong ritardando spans over the bar line, from eighth note 7 (13.1% of bar time) and the longest 8 (15.2%) to 1 (14.2%). We would like to call this formation “bar line ritardando.” Another, much more subtle lengthening concerns eighth note 5 (12.7%). We call this the “mid-bar ritardando.” Besides the performance invariants reported in the research literature (slowing down on phrase endings, melody lead), this average bar profile can serve us as a background for identifying Argerich’s individual reactions to particular configurations within the composition.

Figure 2 presents Argerich’s rhythmic disposition of bars 1-4 alongside the respective excerpt of the score. The rhythm diagram just above the score (L for “left hand”) represents the timing of the accompaniment: every vertical line on the horizontal timeline marks the timing of a detected onset. The width (and consequently the height) of the squares represent the inter-onset-intervals (IOI) on different metrical levels of the score. The smallest squares denote IOIs between neighboring eighth notes, the biggest squares denote IOIs between successive downbeats—i.e. they represent bar durations. All IOIs are given as a tiny numerical value (in ms) in the upper part of each square. The top rhythm diagram in Figure 2 (R for “right hand”) represents the timing of the solo melody: the smaller squares stand for the anacrusis, the dotted half notes, and the quarter notes, respectively. The biggest squares visualize bar durations analogous to the lower diagram. Both diagrams (R+L) are adjusted horizontally to the same timeline. The numbers between the

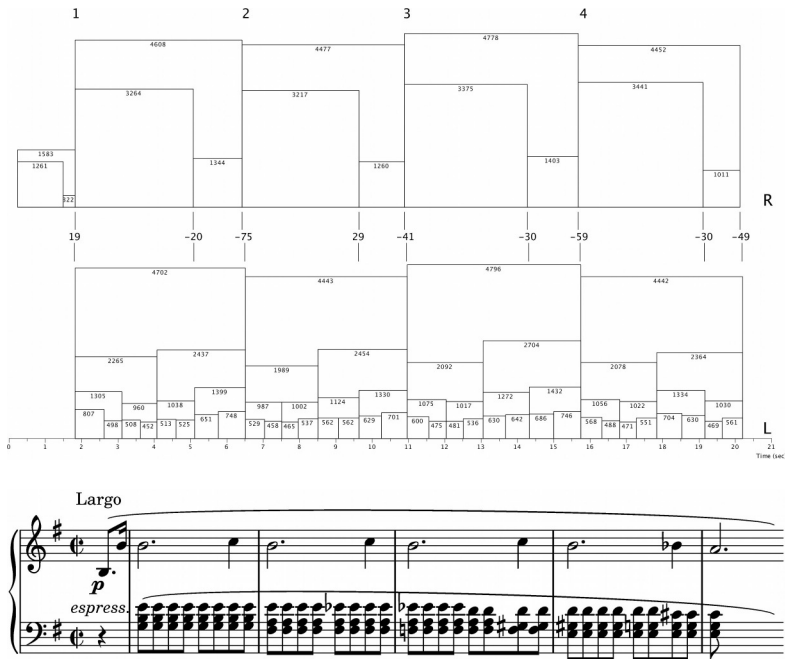


Figure 2. Rhythm diagram and score (according to G. Henle edition, 1968), bars 1-4.

diagrams represent differences between onsets in the right and the left hand, which—according to the score—occupy the same metric position. Most of the time, Argerich plays the solo voice’s onsets earlier than the accompaniment’s: in bars 1-4, the melody leads in seven of nine instances (78%), the average melody lead is 28 ms.

Argerich takes up the slow tempo of the anacrusis in the accompaniment. In bar 1, she starts with a quite long first eighth note (807 ms) which takes 17.2% of bar duration; then she speeds up. No mid-bar ritardando is discernible in bar 1, but the bar line ritardando (eighth notes 7 and 8) is distinct. In bar 2, Argerich starts fast but slows down considerably in the second half of the bar. This tendency is even stronger in bar 3: the first half of bar 3 is fast (28.7 bpm) and takes only 43.6% of bar duration (2092 ms), whereas the second half is considerably slower (22.2 bpm) and lasts for 56.4% of bar duration (2704 ms).

Which properties in the score might trigger the rhythmic phenomena of bars 1-3? Our attempt at inverse interpretation focuses on the repetitive pattern of the solo voice: the piece receives a first impulse from the octave leap of the anacrusis. Then the solo melody seems to be stuck in repetition—the motif C5-B4 is repeated three times in an identical way. With her fine sense of dramaturgy, Argerich seems to make a new effort to gain some speed with every new bar (hence the faster first halves), but this effort is lost as the bar progresses, the tension relaxes and the music seems to stagnate.

The situation changes completely in bar 4: the bar line *ritardando* is absent, but the mid-bar *ritardando* appears for the first time and very distinctively on bar 4, eighth note 5 (704 ms, 15.8%). Why is that? At the end of bar 4, the solo melody progresses from the repeated melodic pattern C5-B4—it descends one tone to Bb4-A4. Following the research literature, we would expect the tempo to slow down at the end of bar 4, which is the end of the first 4-bar period. But the contrary is the case: after the mid-bar *ritardando* of bar 4, Argerich speeds up again. This development makes sense, if we take into account that the quarter notes of the melody are most likely heard as anacrusis to the dotted half notes on the downbeats. The Bb4 quarter note in the solo melody at the end of bar 4, thus, does not belong to the first 4-bar period but to the next formal entity. With the pronounced mid-bar *ritardando* of bar 4, Argerich slows down at the end of the first period just before this anacrusis Bb4, and then gathers speed for the second period: the melodic anacrusis to bar 5 gives a new impulse to the piece, and the rhythm of the accompaniment supports this impulse. Compared with bars 3 (25.1 bpm) and 4 (27.0 bpm), bar 5 speeds up considerably (31.8 bpm).

IMPLICATIONS

Using time measurements, we described the microrhythmic fabric of the first 4-bar passage in Martha Argerich's 1975 recording of Chopin's Prelude op. 28/4. The specificity of her rhythmic interpretation was established against the background of rhythm performance invariants (as reported in the research literature) and an averaged profile of the eighth note lengths in her recording. Then, in a process of inverse interpretation, we have tried to figure out constellations in the score that might have triggered Argerich's specific approach. This procedure casts an analytical light on the composition through the lens of a concrete performance. It is no news that we can learn a great deal about structural features of a composition by listening to an eminent performer. Inverse interpretation attempts to transfer some of this intuitive knowledge into the explicit domain of music performance studies.

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