An accent-based approach to music analysis: Preliminary results

FWF - Lise Meitner Project M 1186-N23
"Measuring and modelling expression in piano performance"

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Background

"Underlying all aspects of analysis as an activity is the fundamental point of contact between mind and musical sound, namely musical perception."
I. Bent and W. Drabkin, "The new Grove handbook in music analysis", 1986

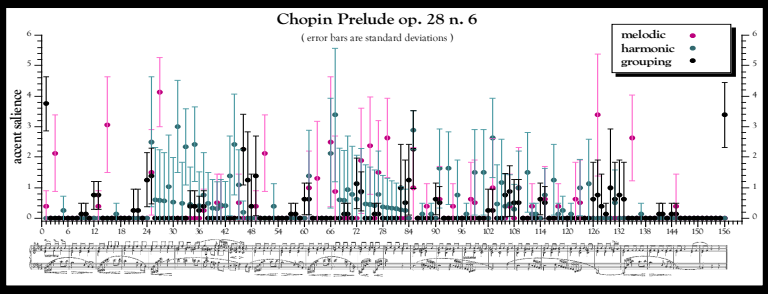
Q: What do listeners perceive in the *structure* of a piece of music (i.e. not loudness, timbre, meaning)?
A: Two aspects of relationships between structural elements:
a) **segmentation** (hierarchical)
b) **accents** (salient events)
Q: How can we best describe that?
A: Ask a group of expert listeners!

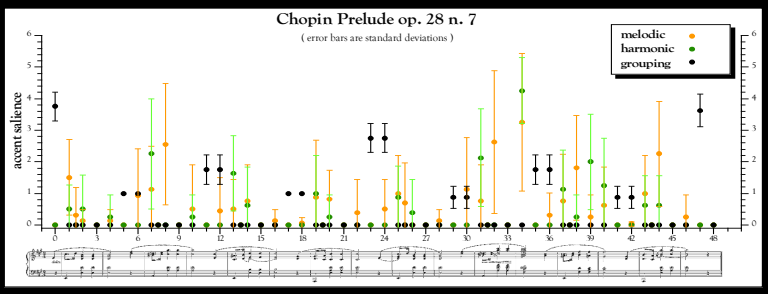
Accents are local musical events that attract a listener's attention.

Immanent accents are evident from the score and involve grouping (phrasing), metre (downbeats), melody (peaks, leaps) and harmony (dissonance).
Performed accents are added by the performer and involve patterns of timing and dynamics that vary in amplitude, form (amplitude versus time), and duration (the period during which expression is affected).

The degree of accentuation varies on a continuous scale. Here we use the term salience for the perceptual importance of a musical event. The salience of an immanent accent may be considered to be the same as perceptual importance when the music is heard in a typical expressive performance, or even in a deadpan performance.

Results:





Cronbach — α test	Op. 28 n. 6		Op. 28 n. 7	
	with zeros	without zeros	with zeros	without zeros
grouping accents	0,90	0,85	0,99	0,98
melodic accents	0,90	0,82	0,77	0,70
harmonic accents	0,84	0,78	0,92	0,87

References:

[1] Friberg, A. (1995). Matching the rule parameters of PHRASE ARCH to performances of "Träumerei": A preliminary study. *STL – QPRS*, 36 (2–3), 063–070. [2] Lerdahl, F., and Jackendoff, R. (1983). A generative theory of tonal music, Cambridge, MA: MIT Press. [3] Parncutt, R. (2003). Accents and expression in piano performance, In K. W. Niemöller (Ed.), *Perspektiven und Methoden einer Systemischen Musikwissenshaft (Festschrift Fricke)* (pp. 163–185). Frankfurt/Main, Germany: Peter Lang.

Aims

We are exploring the complex relationship between accents and expression in piano performance.

We are creating a perceptually relevant analysis of selected pieces,
⟶ as a basis for understanding performance expression;
⟶ as a basis for synergetic interaction between music theory and music psychology.

Methods

Participants: 8 music theorists from the Kunst-Uni and the Uni-Graz.

Procedure: We are analyzing a selection of Chopin Preludes. Our method combines aspects of generative grammar (Lerdahl and Jackendoff, 1983), phrase analysis (Friberg, 1995) and accent theory (Parncutt, 2003).

Segmentation: we asked participants to hierarchically analyse the phrase structure of a score. They marked the boundaries (start and end) and climax of each phrase, and indicated its hierarchical level.
Accents: participants marked melodic and harmonic accents, and evaluated their relative importance (salience, on a point scale from 1 to 5). We derived grouping accents from the phrasing structure, assuming that every phrase starts with a grouping accent, and the salience of a grouping accent is given by its hierarchical depth (the number of hierarchical levels at which phrases begin simultaneously).

Guidelines:
The following guidelines are not strict. Please follow your musical intuition.

Phrasing: First, regard the entire piece or excerpt as one long phrase. Then divide it into 2-4 subphrases. Then divide each subphrase into sub-subphrases, right down to the individual notes.
Melodic accents: First label the highest and lowest tones of the whole melody, then label the local peaks and valleys, e.g. the highest and lowest pitches in a given phrase. The salience of a melodic accent may depend on the distance from the (local) average pitch and the size of immediately preceding and following intervals. Peaks are generally more salient than valleys.
Harmonic accents: Any chromatic note (i.e. a note foreign to the prevailing scale) and any chord that is relatively dissonant or harmonically surprising may be a harmonic accent. The salience of a harmonic accent may depend on local dissonance, the harmonic distance from the prevailing tonality, or the degree of harmonic surprise.

Discussion:

The results suggest that an apparently trivial form of musical analysis can yield new insight into musical structure and performance. The data are generally consistent with our theory of accent salience, confirming its music-theoretic reality.

Participants were generally able to mark and evaluate accents after a short introduction. They also found the task interesting and musically relevant. Agreement among participants was higher at phrase boundaries (grouping accents) than at melodic and harmonic accents. Phrase boundaries were determined by inter-onset interval (greater between than within phrases) and possibly also contour (expected rise-fall arch shape), metre (tendency for phrases to start on the beat) and notated phrasing. Participants generally agreed with our guidelines for estimating the salience of melodic and harmonic accents.

To shed new light on expressive performance, we are striving for a new interdisciplinary synergy. Our approach links together music theory/analysis and expressive music performance using psychological research methods. We are challenging these three disciplines to work more closely together and take each other's ideas and methods more seriously.

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