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Review of the 1993 Conference of the Society for Music Perception and Cognition

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ABSTRACT: The 1993 conference on music perception and cognition in Philadelphia covered a wide range of topics, including the perception and cognition of: melodic accent, melodic cues to meter, accented rests, meter extended through silence, expressive timing in percussion music, tonality, finality of cadences, modulation, key ambiguity, pitch salience in musical passages, melodic contour, North Indian rags, tuning of melodies, absolute pitch among non-musicians, and melodic expectation and continuation. Many of these issues have ramifications for the theory and analysis of tonal and atonal music.

Introduction

[1] The Conference of the Society for Music Perception and Cognition (SMPC) was held from June 16–19, 1993 at International House, University of Pennsylvania, Philadelphia. It was organized by Eugene Narmour of the Department of Music, University of Pennsylvania. The Chair of the program committee was Carol L. Krumhansl, Department of Psychology, Cornell University, Ithaca NY.

[2] The conference was preceded by a larger conference on the same subject: the 2nd International Conference on Music Perception and Cognition (ICMPC), held in Los Angeles in February 1992. The next major conference in the field will be the 3rd ICMPC in Liege, Belgium, from 23–27 July 1994. The SMPC conference in Philadelphia was conceived on relatively small scale, but still covered a wide range of current issues.

[3] It is impossible in the space of this review to mention all the papers presented. I will concentrate instead on those papers that I feel are of most relevance to music theorists. For example, I do not discuss papers on performance, computer applications, and neuropsychology in this review.

Rhythm, Meter, and Accent

[4] Recent research in music perception has devoted a great deal of attention to the perception of musical pitch structures, melody, harmony, and tonality. A new trend became evident at the conference in Philadelphia: Temporal structure took over from pitch as the largest category of contributed papers.

[5] David Huron (Waterloo) and Matthew Royal (Western Ontario) addressed the issue of melodic accents arising from

changes in the direction of melodic contour and from the size of melodic leaps. They compared syllabic stresses in a corpus of gregorian chants with melodic accent strengths as predicted by a number of algorithmic models.

[6] Piet G. Vos (Nijmegen) and Arjan van Dijk (University of Amsterdam) analyzed melodic cues to meter in four compositions of J.S. Bach. Using the technique of autocorrelation, they confirmed that interval patterns (direction and approximate size of intervals between successive tones) tend to repeat themselves at temporal intervals corresponding to beat and bar durations, but not at other intervals. The technique of autocorrelation predicted measure length with reasonable reliability, but was unable to determine the position of the downbeat.

[7] Justin London (Carleton College) considered the phenomenon of accented rests. Most music-perceptual accounts consider only events that precede an accented rest. London pointed out that it is necessary also to look forward to future events, especially in cases where the listener is already familiar with the style of a given piece, or with the piece itself.

[8] Robert O. Gjerdingen (SUNY at Stony Brook) investigated the perception of sinusoidally amplitude-modulated signals with modulation frequencies in the rhythmic range (say, 0.3 to 20 Hz). Such signals are physically perfectly "smooth" and thus contain no obvious physical "events" (or onsets). They may nevertheless be perceived as a series of events, occurring at specific temporal positions (phases) relative to the peaks in the sinusoidal modulation.

[9] Eric F. Clarke and W. Luke Windsor (City, London) played rhythmic passages followed by isolated probe events, and asked listeners whether the isolated events fell on or off the beat. They reported strong effects of memory decay, tempo, and slowing of pulse sensations in the absence of real-time reinforcement.

[10] Jeff Bilmes (MIT) modeled expressive timing in percussive musical rhythms by a combination of tempo variation and event time-shifting, illustrating his presentation with recordings of real and synthesized African percussion music incorporating specific temporal manipulations.

Tonality

[11] Fred Lerdahl (Columbia) discussed the establishment of a referential tonic center. According to his theory of tonal pitch space, the tonic is the center of the most compact region of pitch space that may be represented by paths between superordinate events within a prolongation region.

[12] Wendy Boettcher (California, Irvine) reported an experimental study of the sense of completeness evoked by various harmonic cadences. Results were in qualitative agreement with music-theoretic notions of completeness.

[13] William Forde Thompson (York University) and Lola L. Cuddy (Queen's University) investigated the perception of modulation (key change) in a set of specially-prepared four-voice textures. Listeners were musicians. Key-distance judgments were influenced not only by music-theoretical estimates of key distance and by the way modulations were approached, but also by the presence or absence of expressive timing and dynamics.

[14] Frank C. Riddick (Colorado) analyzed the tonality of Zemlinsky's Second String Quartet (Op. 15), emphasizing the study of highly ambiguous tonal passages can lead to a better understanding of tonality perception in general.

[15] Caroline Palmer and Susan Hollerin (Ohio State) investigated the perception of pitch in harmonic/contrapuntal music. Their experimental technique was to change the pitch of a note in a passage and to ask listeners whether they heard the change. Harmonically related pitch changes, and changes occurring in the mid frequency range, were least noticeable.

Melody

[16] Kathryn Vaughn (MIT) and Edward C. Carterette (Southern California) explored perceptual relations among North Indian rags by the technique of similarity ratings and multi-dimensional scaling. Western musicians were found to be sensitive to conventional emotional meanings of rags—even if they had no previous knowledge of Indian music.

[17] James Carlsen and Marc Cassone (Washington) presented melodies in which selected tones were mistuned by 20 or 40 cents by comparison to equal temperament, and investigated sensitivity to mistuning as a function of scale-degree, tempo,

and timbre. They compared results with an analysis of recordings of cello music.

[18] David Huron (Waterloo) applied the perceptual law known as Fitt's law to both the perception of apparent motion in human vision and to the fission and fusion of auditory streams or melodies. He tested hypotheses based on that law by analyzing a database of melodies from ten different cultures.

[19] Sven Allback (University of Gothenburg) and Sven Emtell (KTH, Stockholm) developed algorithmic models for the analysis of pitch categories, meter, phrase structure, and tonality, and applied them to some 5000 Swedish folk melodies. In a separate talk, Allback applied Krumhansl's probe-tone method to Swedish folk melodies, and obtained results very similar to those obtained by Krumhansl, in spite of pronounced variations in intonation—suggesting that intonation plays a secondary role in the establishing of a tonal hierarchy.

[20] Daniel Levitin (Oregon) described an ingeniously simple experiment to test the absolute-pitch ability of non-musicians. He asked psychology students to list the popular songs that they knew best. From the results, he compiled a list of the best-known songs. In the experiment proper, he asked individual participants to sing a few bars of a given song, handing them the cover of the corresponding CD to jog their memories. The response of 24% of all subjects was within one semitone of the correct key, and 67% of all subjects came within 2 semitones.

Expectancy

[21] Carol L. Krumhansl (Cornell) presented the results of psychological tests of Narmour's implication-realization model. In general, the model was found to perform well (however, the model's performance was not compared with that of other possible models). Further psychological tests of the expectation-realization model were reported by Mayumi Adachi and James Carlsen (Washington), Robert Rawlins (Clayton), and James Buhler (Pennsylvania).

[22] David H. Bradshaw (Washington) investigated the perception of melodic continuation. The degree of expectation of a given note was found to correlate highly with the degree of surprise that follows the actual perception of that note.

[23] Steve Larson (Indiana University) developed a model that combined research on key determination with research on melodic expectancy, taking both aspects into account in the prediction of key and of melodic continuation.

Presidential address

[24] In his presidential address, David Wessel (Center for New Music and Technology, Berkeley) stressed the importance of musical relevance in music perception research. It is essential that researchers in all areas of music, including perception and theory, have a thorough (and, if possible, practical) understanding of the musical background and ramifications of their work.

[25] Wessel also remarked on the remarkably small number of currently filled, full-time university positions in the field of music perception/cognition or systematic musicology (less than 200 in North America) by comparison to music theory (about 4000) and historical musicology (about 3200). These figures clearly do not well reflect the relative importance of the three subject areas for students currently studying music at university level—that is, for musicians of the 21st century. Nor do the figures correspond well with the relative numbers of people in the three areas that are currently available and well qualified to fill post-secondary positions. Any university that manages to offer a position in music perception in the near future can count on receiving a large number of applications from musically gifted, well published, and internationally recognized scholars.

[26] Wessel suggested that the problem may be solved by improving communication and encouraging collaboration between the fields of music perception and music theory. A promising strategy for the immediate future will be to organize music perception conferences in close spatial and temporal proximity to theory conferences, to enable people to attend two conferences in one trip.

Conclusion

[27] The papers presented in this and other recent conferences in music perception reflect an encouraging trend: Music-perceptual issues are not as music- theoretically trivial as they used to be. Times have changed since the first measurement of

the mel scale! Slowly but surely, the gap between music perception and music theory is becoming smaller. Research in music perception increasingly involves musically sophisticated judgments about good music, and the results of music-perceptual research are becoming increasingly relevant to music theory and analysis.

[28] Researchers from both disciplines may benefit from these developments by engaging in cross-disciplinary collaboration. Admittedly, a synthesis of music perception and music theory is still rather distant— but the prospect is becoming increasingly feasible.

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