

1-1-2000

## MUSICOG 2001 at Ohio State

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### Recommended Citation

Temperly, David (2000) "MUSICOG 2001 at Ohio State," *Journal of Music Theory Pedagogy*. Vol. 14, Article 11.

Available at: <https://digitalcollections.lipscomb.edu/jmtp/vol14/iss1/11>

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*Reviews*

Conference Report: *MusicCog / 2001*

Reviewed by David Temperly

**M**usicCog/2001, which took place at Ohio State University on May 18-20, 2001, is the latest in a series of workshops held at Ohio State on the subject of music cognition (previous workshops were held in 1998 and 1999). The MusicCog workshops differ from conventional conferences in several respects. First, all speakers are invited: they consist of renowned scholars in music cognition from around the world, as well as researchers from Ohio State's own distinguished music cognition group. (Five guest speakers at MusicCog/2001 gave one or two talks each; six Ohio State speakers also gave talks.) Secondly, a series of panel discussions interspersed with the talks allow an unusual degree of participation and input from the audience. Thirdly, the workshops are free, making them an ideal forum for students or others wishing to "get their feet wet" in the exciting field of music cognition.

The atmosphere at MusicCog/2001 was relaxed and intimate. There were generally about 50-70 people in attendance at any given time; at a guess, I would say roughly half of those present were students. While the Ohio State contingent was large, many other institutions were also represented; I spoke with people who had come from as far away as Nevada and the United Kingdom.

Several of the papers at MusicCog/2001 had implications for music pedagogy. Elizabeth West Marvin explored the teaching of aural skills, with specific regard to students with absolute pitch. As Marvin noted, the rare and much-valued ability of absolute pitch can in fact be a hindrance, as it tends to discourage the development of relative pitch and fluency with intervals and harmonic func-

tions. Marvin advocated an approach to aural skills pedagogy which is suitable for both AP- and non-AP-possessors. This method is based largely on using scale-degree numbers to refer to pitches, and involves frequent changes of key, so that AP-possessors must get used to changing their frame of reference according to the context.

A much-discussed issue in music education today is the effect of musical training and activity on other abilities. Two papers at MusicCog/2001 shed important new light on this issue. William Thompson reexamined the so-called "Mozart effect": the alleged short-term enhancement of spatial-reasoning tasks by exposure to classical music. In an attempted replication of the Mozart effect, Thompson found that listening to classical music could indeed lead to improved performance on spatial tasks; however, Thompson argued that this effect was mostly explained by the fact that certain kinds of music enhance mood and arousal, which in turn enhance spatial reasoning. (It was found, for example, that faster-tempo music improved spatial-task performance more than slower-tempo music.) A talk by Eugenia Costa-Giomi examined the long-term effect of musical training on a number of variables including quantitative and spatial reasoning ability, as well as social and personality measures such as self-esteem. Costa-Giomi noted that, while other studies have shown that students participating in music and other arts tend to have higher academic performance, such studies have generally been only correlational. Costa-Giomi undertook a controlled study in which an "experimental" group of Montreal school children were given three years of piano lessons while a "control" group was not. The performance of the experimental group on quantitative/spatial reasoning tests and other measures was significantly better than the control group after two years; after three years, however, there was no longer a significant difference. In Costa-Giomi's view, this may suggest that musical training mainly serves to accelerate intellectual development that will eventually occur anyway. However, Costa-Giomi stressed (and others agreed) that the entire idea of trying to justify music education by appealing to its enhancement of other abilities is misguided; music education should be valued for its own sake.

A recurrent theme in the papers at MusicCog/2001 was the issue of differences in perception among listeners. Emmanuel Bigand

explored differences in perception due to training, arguing that these have often been overstated. In a study where subjects rated melodic tension at points in a melody, musically trained and untrained subjects proved remarkably similar in their judgments; in both cases, judgments reflected sensitivity to tonal stability, not just relative to the local context but to the larger context as well. (Bigand's second talk, relating to harmonic priming, reached a similar conclusion regarding the sensitivity of both trained and untrained listeners to tonal context.) By contrast, Paul von Hippel's talk drew attention to a possible difference in perception due to training, in the area of melodic expectation. Von Hippel's concern was with two hypothesized rules of melodic expectation: post-skip reversal (change of direction after a skip) and step momentum (continuation in the same direction after a step). Von Hippel found that both of these rules were reflected in expectancies of trained listeners much more strongly than untrained ones. Von Hippel also argued, however, that these perceptual strategies are best regarded as "heuristics", since it is doubtful (based on statistical analyses of melodies by Von Hippel and Huron) that either principle is operative in the way melodies are actually constructed.

In a similar vein, Bill Thompson's first talk also argued for important differences between trained and untrained listeners. The broader theme here was transfer: the carryover of skills from one cognitive domain to another. Thompson wondered if trained musicians' sensitivity to pitch would result in an increased sensitivity to intonation even in speech; an experiment suggested that it did. Trained and untrained subjects (non-Spanish speaking) were played recordings of Spanish speakers who had been told to read Spanish sentences in a happy or sad manner; remarkably, trained listeners interpreted the intended emotion much more accurately than untrained listeners. One final talk concerned with differences in perception was by Jamshed Bharucha. Using magnetic resonance imaging, Bharucha studied brain activity of American and Indian subjects (trained in the US) when listening to Indian or American music. American subjects showed increased brain activity when listening to American music only; Indian listeners showed increased activity for both American and Indian music—not surprisingly, given their familiarity with both kinds of music. A multi-dimensional scal-

ing analysis of brain activity during these trials showed a clear separation between American and Indian listeners.

The topic of music performance was not neglected at MusicCog/2001. Caroline Palmer presented a study of “displacement” errors in piano performance, in which a note is played at a location other than the correct one. She found that the probability of a note being played erroneously at a certain location depends on the distance between the played location and the correct one, and also—most interestingly—on the similarity in metrical strength between the two locations: a novel and compelling demonstration of the role of meter in our mental representations of music. Focusing on a very different population, Udo Will presented research on the music of the Pitjantjatjara ethnic group of Central Australia. Since—in Will’s view—the Western concept of a “note” is not really applicable to this music, spectral analysis was used to study its pitch organization. Despite the absence of notation, singers from this group demonstrate an extraordinary consistency in their performances, down to the most subtle nuances of pitch—as Will confirmed by examining the pitch distributions of different performances.

Two papers on the final morning of the workshop dealt with the issue of timing. Emendine Penel began by considering a peculiar phenomenon of perception: the spatial realm tends to be dominated by vision, while temporal perception is dominated by audition. This phenomenon was further explored in a study in which subjects were presented with a pulse represented both auditorily (by a repeated tone) and visually (by a dot moving back and forth across a screen). When the visual and auditory pulses were shown separately, people seemed more sensitive to slight irregularities in the auditory pulse than in the visual one; when both were shown together, judgments of the regularity of the composite pattern were more affected by the auditory pulse. Finally, Mari Jones’s talk dealt with the effect of timing on attention. She reported experiments showing that judgments of pitch in a same-different task depended on the timing of the comparison pitch relative to a previously-established pulse; this confirms Jones’s theory that rhythmic patterns establish “attentional pulses” which guide attention to future events.

MusicCog/2001 was organized by David Huron, who presented a very stimulating and entertaining talk of his own on the subject of timbre. Huron asked the question, is the mental representation of timbre a dimensional one (in which a sound is represented as a point or points in a dimensional space) or a featural one (in which sounds are represented as clusters of features)? Huron argued for the latter view; the way to understand timbre, he suggested, may be by probing its ecological origins—namely, our need to interpret the sounds in the world around us. For example, if low-frequency sounds sound more threatening to us than high-frequency sounds, this may be because they suggest larger resonating bodies—for example, a larger animal (or person) versus a smaller one.

As well as talks and discussions, MusicCog/2001 featured tours of the impressive music cognition facilities in the School of Music and psychology department at Ohio State; posters were also shown presenting music cognition research by Ohio State graduate students.

Coming away from MusicCog/2001, one could not help but be impressed by the high standard of work in the field today, the atmosphere of optimism and excitement, and the collegial and open-minded way in which ideas are presented and debated. Anyone wishing to keep abreast of developments in music cognition is urged to keep their eyes open for the next MusicCog...which I understand is tentatively slated for 2003.