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MusicCog-99- A Workshop Symposium in Music Cognition

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Reviews

MusicCog/99
A Workshop Symposium in Music Cognition.

Reviewed by Edward Klonoski

MusicCog/99 was held on the campus of the Ohio State University from May 14-16, 1999. The program described the event as differing from more traditional conferences in that many of the MusicCog/99 presentations were general or review in nature—so that the workshop was an excellent opportunity to gain an overview of the state of the art in music cognition. Presentations covered a broad spectrum of topics including: infants' musical perception, ethnomusicological applications, melodic expectancy, key determination, music and emotion and rhythmic/metric perception. Overall, the papers were very informative and represented well the breadth of current music cognition research.

The conference featured a distinguished group of invited speakers, including Carol Krumhansl (Cornell University), Dirk-Jan Povel (Nijmegen Institute for Information and Cognition, the Netherlands), and Sandra Trehub (University of Toronto), as well as presentations by a number of leading music cognition researchers affiliated with Ohio State's Center for Cognitive Science. In addition, the annual Poland Lecture, which honors long-time, distinguished Ohio State music theory faculty member William Poland, was delivered by Nicholas Cook (University of Southhampton, England).

Given the expansive range of topics currently being explored in music cognition, one might reasonably expect that music instructional techniques and goals, especially those that fall under the broad umbrella of aural skills, would present fertile ground for the investigation of musically significant questions. However, the relationship of the research presented at MusicCog/99 to music theory pedagogy was, for the most part, indirect and of limited import. It should be noted here that pedagogy was not a central focus of the confer-

ence. In fact, with only a few exceptions, discussion of potential implications of perception research for developing and refining musical understanding and skills—the primary goal of music theory and aural skills instruction— was entirely avoided. This raises important questions about the relationship between music cognition and music theory pedagogy. But before examining more fully the issue of why a more direct and meaningful exchange between these two fields has failed to materialize, I will report some of the pedagogically relevant findings I was able to infer from the conference papers and discussions.

In her investigation of infants' musical perception, Sandra Trehub found that babies are better able to detect pitch changes in scales containing unequal steps than in scales composed of equal steps. She also found that adults are extremely biased by their overfamiliarity with the major scale, yet they detect pitch change no better with unfamiliar, unequal-step scales than with unfamiliar, equal-step scales. This reinforces the pedagogical tradition of using the major scale to introduce the general topic of scales, and then proceeding to other less familiar scale forms. Perhaps more importantly, it raises the possibility that further research might reveal a kind of optimal order for teaching various scale types that is based not on conceptual principles, but on perceptual grounds. Such potential points of convergence between cognition and music theory pedagogy need to be made explicit and further explored.

David Temperley, in his presentation "What's Key for Key? The Krumhansl-Schmuckler Key-Finding Algorithm Reconsidered," examined the performance of several key-finding algorithms and proposed a revised model that more accurately determines the key of a given passage when provided with input data. Temperley characterized his algorithm as a preference rule system "which considers many possible analyses of a piece or passage, evaluates them by certain criteria, and chooses the highest-scoring one." The principal improvement of Temperley's algorithm over other models is its ability to re-evaluate a key assignment in consideration of a larger context. His model continually reassesses key determinations in light of new pitch data. Temperley chose a computational, rather than an experimental, model because "seeking a model that performs a task successfully may shed light on how humans perform the task."

However, he acknowledges that a computer model that successfully performs a task may not reflect the cognitive processing that humans do to execute the same task. Until a direct relationship between key finding algorithms and human cognitive processes can be demonstrated, the pedagogical applications of such models are limited.

There were several papers devoted to melodic expectancy, a topic with considerable potential to inform aural skills pedagogy. Yet, the research presented showed more promise as a descriptive tool for distinguishing musical styles than as an instructional tool for refining perceptual skills. Melodic expectancy results from the interaction of numerous musical parameters, including rhythm, meter, timbre, harmony, and melody. Largely for reasons of experimental control, the studies presented at the conference focused almost exclusively on melody. This may well be a necessary first step in understanding the highly complex mental processes involved in melodic expectancy. Still, the research in this area does not yet adequately account for the influence of musical parameters other than melody to provide a basis for systematically teaching or refining melodic expectancy skills.

Because the rest of the papers presented at the workshop dealt with topics unrelated to music theory pedagogy, I turn now to the consideration of the tenuous relationship between music cognition and music theory pedagogy. One would expect that music theory and aural skills instruction would be the direct beneficiaries of cognition research. Based on the description of music cognition provided in the MusicCog/99 program, there would seem to be substantial overlap between the two fields: "Music cognition approaches the study of music as a manifestation of human minds/brains. The field involves music theorists, systematic musicologists, psychologists, cognitive scientists, and philosophers interested in comprehending human music-making and musicality." Music-making and musicality occupy central positions in music pedagogy as well. However, the considerable insights gained in recent years into how humans process auditory stimuli have had little if any meaningful influence on the methods used to develop and enhance musical skills and understanding. Similarly, the experiential/anecdotal evidence of human cognition upon which so many music instructional tech-

niques are based finds its way into comparatively few cognition studies. To be sure, there is no single reason underlying the disconnect that exists between the two fields, and both disciplines have been slow to finds ways to bridge the gap.

That pedagogical issues were all but excluded from a conference with such an impressive representation of diverse disciplines is telling. Equally revealing was the conspicuous absence of music theorists and music educators from the workshop, save for a few Ohio State faculty and student participants. Whether this reflects a general sense of apathy toward music cognition on the part of educators and theorists, or is simply indicative of the failure of cognition research to reach the theory and aural skills classrooms, is open to debate. Most likely it is a combination of the two, with each feeding the other and resulting in an ever-widening communications gap. Since many cognition researchers have never taught a theory or aural skills course, it seems obvious that theory and aural skills instructors need to be more actively engaged in the field of cognition if substantive pedagogical questions are to posed and investigated.

I am not the first to put out such a call. David Butler, a leading cognition researcher at Ohio State, lamented the growing chasm between cognition and pedagogy in his article "Why the Gulf Between Music Perception Research and Aural Training?"[1] Butler acknowledged that few cognition experiments have much direct relevance to "real" music. This likely stems from the need for highly constrained experimental conditions that often restrict researchers to using contrived materials with only limited musical application—isolated intervals, melodic fragments in the absence of harmony or meter, etc. Butler urged music educators to become more involved in cognition research. He strongly suggested that it is music educators, rather than cognition specialists, who are best positioned to take the first step in the drive to develop effective teaching strategies founded on systematic scientific research. I echo his sentiments here and extend his exhortation to music theorists as well.

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[1]David Butler, "Why the Gulf Between Music Perception Research and Aural Training?" *Bulletin of the Council for Research in Music Education* No.132, (Spring 1997): 38-48.

In fairness to theorists and music educators, it can be quite challenging to extract from cognition research information that can be easily applied in the classroom. At least part of the difficulty results from the abundance of scientific/psychological terminology that pervades most cognition books, articles, and conference presentations. The average music educator or music theorist is not well versed in scientific methodology and terminology. Yet given the current thrust of cognition research, we should not expect a decrease in the use of scientific language any time soon. Of course, jargon renders many subdisciplines within music—theory near the top of the list— inaccessible to the uninitiated. So, the problem is not new, nor is the solution: dialogue.

The language barrier is not one of mere semantics. Rather, it points to a fundamental difference between the goals of music cognition and those of music pedagogy. I suggested earlier that the highly constrained, scientifically framed experiments reported on at MusicCog/99 may be a necessary early stage in an evolving theory of music cognition that one day will be able to more fully accommodate the richness and complexity of real compositions. But it seems just as likely that the general direction of current cognition research is not a prelude to a theory aimed at better understanding music or teaching others to understand music. A discussion at the MusicCog/99 workshop succinctly captured the essence of this observation. In response to a question concerning the musical relevance of a particular cognition study, one of the conference participants responded that they [cognition researchers] "are studying cognition, not music." That is, the primary goal of music cognition is not to understand music, but to use music as a means to understand how the human mind processes auditory stimuli. Music provides an ordered, logical medium to investigate cognitive processes, but the vast majority of music cognition research focuses on understanding *existing* perceptual skills and not on refining or developing new perceptual skills.

This should not be taken as an indictment of the goals of music cognition research. It is intended as an honest assessment of the relationship between the research presented at MusicCog/99 and music theory pedagogy. The field of cognition is vibrant, exciting, and will undoubtedly continue to expand our understanding of

numerous aspects of human cognition both directly and indirectly related to music. Its contribution to music theory pedagogy is at present unclear. The potential for a mutually beneficial partnership exists, but this potential can only be realized if participants from both fields begin to identify and actively pursue common goals.