Guest Editorial

Special Issue: Papers from the 10th Rhythm Perception and Production Workshop

The International Workshop on Rhythm Perception and Production had its 10th edition in 2005, when the workshop took place in the castle of Alden Biesen in Bilzen, Belgium, July 2–6. The first Rhythm Perception and Production Workshop (RPPW) was held in 1984, aiming to create an interdisciplinary forum for studying human processing of temporally structured information. Having its roots mainly in psychology, the RPPW attracts an increasing number of researchers from the most diverse disciplines: from computer science to linguistics and from music theory to biology. The 10th edition had more than 60 contributions in total. Due to the interdisciplinary nature of the RPPW, the scope of the contributions was broader than any single journal could publish. Therefore nine of them were selected to be published in this issue of *Music Perception*, and another series will be published shortly in *Human Movement Science*.

The contributions to the workshop aim at understanding or modeling a certain process in the human information processing system. To this end the researcher selects a certain type of subject, a stimulus, and a task and tries to make inferences about the process by analyzing the responses. Process and task are compartments inside the subject; stimulus and response are in the outside world. This relation is depicted schematically in Table 1.

While this is the approach of the field as a whole, most contributions focus in only one or two of these compartments. In Table 2 an overview is given of the typical foci of these contributions.

If the articles in this issue are analyzed according to this scheme, three of them can be placed in the category of focus on the Subject. Bispham asks the fundamental question of what makes musical rhythm so important for members of the human species. Snyder and colleagues confirm that the perception of rhythms is very culturally determined, and Nakata and colleagues show that deaf children with a cochlear implant can hear the rhythm of children's songs quite well. Melody perception, however, is still a problem for them.

TABLE 1. The compartments of the work in perception and production

Stimulus	Subject Process Task	Response

The categories Stimulus and Response are closely interlinked, since the relation stimulus–process–response is a closed loop as the response becomes the stimulus for the next iteration between listener and performer. We see this cycle very well in the three articles studying beat induction. McKinney and Moelants try to find a stimulus feature, as determined by a computer analysis of the sound, that influences the metrical level at which the listener places the musical pulse. Eck and Gouyon and colleagues concentrate on the analysis of the musical sound, that is, the Response. Eck has developed a method to find not only the dominant periodicities in the rhythm by an autocorrelation technique but also the exact phases at which important events occur. Normally this information is lost with autocorrelation. Gouyon and colleagues investigate a whole range of features that can be extracted from the musical sound for their effectiveness for beat extraction.

Luck and Toiviainen study the very specific Task of an ensemble to follow the gestures of the director.

Neuhaus and Madison and Knösche finally direct their focus on the Process. Madison finds that subjects can consistently judge the strength of the impulse in music that makes one want to move—the groove, as he calls it. Neuhaus and Knösche give an interpretation of physical signals from the brain when it is processing rhythmic and melodic Gestalts.

Some other results of the workshop are worth mentioning in telegram style; we hope that they will lead to publications in the future.

There is growing awareness that cooperative rhythmic activities are typically human and do not occur

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TABLE 2. Foci of contributions

	SUBJECT Evolution of rhythmic skill Software agents vs. humans Animal vs. human Influence of culture, age, deafness	
STIMULUS Analysis of musical score Improving notation Classification of rhythms Temporal manipulation Recognizability of sound	PROCESS Corporeal interpretation Categorical perception Perceptual illusions Linear phase correction Attention and memory Timing in action execution	RESPONSE Analysis of interpreted music Beat tracking Analysis of musically embodied movements
	TASK Attention disruption Interfering with rhythmic process Dual tasks: manual and verbal Cooperative tapping/reciting	

elsewhere in the animal world to this extent, and there is a growing interest in studying the relation between the perception of rhythm and the human locomotion system. The phonological loop is important for the reproduction of rhythmic patterns. Categorical perception clearly plays a role in the perception of rhythmic patterns. It is now possible to construct a computer as an accompaniment player that corrects timing errors in the same way as a human player. There is a new mathematical approach for the analysis of metrical hierarchies of musical pieces. There are interesting proposals for the notation of complex temporal relations in musical scores to assist the performer. Finally, the computational approaches to beat tracking cannot yet compete with the human listener.

One can conclude that the area of rhythm perception and performance is a healthy area of research with many purely scientific outcomes but also more and more practical results.

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