

---

## Cross-Cultural Studies

---

### The Processing of Pitch and Scale: an Event-Related Potential Study of Musicians Trained Outside of the Western Music System

Laura Bischoff Renninger<sup>1</sup>, Michael Wilson<sup>2</sup>, Emanuel Donchin<sup>3</sup>; <sup>1</sup>Shepherd College, USA; <sup>2</sup>University of Illinois, USA; <sup>3</sup>University of South Florida, USA

Time: Fri 19 1.30 pm, Stream: B Proc. Page: 248-249  
Venue: Burrows Lecture Theatre

The current study was inspired by previous reports from Bischoff, Granot, and Donchin (ICMPC5, ICMPC6) in which the P300 component of the Event-Related Potential (ERP) was used to examine responses of Western musicians to scalar deviations. The current study extends the efforts of Bischoff et al. to non-Western musical systems and focuses specifically upon responses to scalar deviations within the Javanese pelog scale by groups of musicians trained within the Western and Javanese systems. The principal aim is to ascertain whether results found in previous experiments may be obtained cross-culturally. Participants include five subjects trained in the Western system only (control group) and five subjects trained in both the Western and Javanese systems (experimental group). Tasks include identifying scalar deviations within the Western diatonic scale, identifying scalar deviations within the Javanese pelog scale, and identifying target letters in a visual control task. EEG and overt behavioral responses are recorded. Results show significant differences between group responses to diatonic and Javanese scale conditions. Interesting results also arise in terms of how tones and intervals in the different scales are conceptualized by subjects in both groups. Control subjects especially tend to assimilate pelog scale intervals to intervals in the Western equal-tempered scale.

### Comparison of Dotted Rhythm Expression Between Japanese and Western Pianists

Kengo Ohgushi; Kyoto City University of Arts, Japan

Time: Fri 19 2.00 pm, Stream: B Proc. Page: 250-253  
Venue: Burrows Lecture Theatre

It is often pointed out by music critics and researchers in Japan that the sensation of rhythm of Japanese people is somewhat different from that of western people. However, there seems to be no clear experimental evidence of the above general agreement. The aim of this study is to measure the IOIs (interonset intervals) of Japanese and Western pianists' performances of a dotted rhythm with the duration ratio of 3:1 (dotted eighth note plus sixteenth note) and to examine whether there is systematic difference in the performance of the dotted rhythm between Japanese and Western pianists. The musical material consists of various performances of the first eight measures in the first movement of Mozart's Piano Sonata K.331. We collected fifty-seven performances by Japanese student pianists, Japanese professional and Western professional pianists from CDs and live performances. IOIs of the dotted rhythm were measured with the audio editing software "Sound Designer II". The live performances were recorded and analyzed using MIDI hardware and the software "Vision". The result is that the average IOI ratios of the dotted rhythm are 2.90:1 for 21 Japanese student pianists, 3.12:1 for 17 Japanese professional pianists and 3.52:1 for 19 Western professional pianists. The difference between Japanese student pianists and Japanese professional pianists was not significant, but the difference between Japanese and Western professional pianists was significant. This seems to support the assumption that the sensation of rhythm of Japanese people is somewhat different from that of Western people.

### Effects of Cognitive Schemata in the Perception of Non-Diatonic Intervallic Structure in Arab Music

Takahiro Aoyagi; University of California, USA

Time: Fri 19 2.30 pm, Stream: B Proc. Page: 254-255  
Venue: Burrows Lecture Theatre

This paper introduces part of my study on *maqām Rāst*, a melodic mode in Arab music. It examines the mode's intervallic ordering and pitch hierarchy, as well as the effects of schemata on perception. Perceptual data presented here were derived from three experiments using distinct methods. (1) Experiment 1: Dissimilarity

judgment. (2) Experiment 2: Probe-tone. (3) Experiment 3: Major/Minor rating. Two groups of musicians, Arab music performers and Western musicians, participated in the experiments. Experimental data provided by Western musicians suggest that they could recognize the distinctiveness of this mode, but they did not retain the correct mental representation of the mode's intervallic structure as Arab musicians did. The results from experiments with three distinct methods indicate that one's cognitive schema may influence perception, but schema effect could be modified by the experimental task.

### Do You Hear This Music in the Same Way as Me? Intercultural Differences in the Perception of Musical Structure

Carolyn Drake<sup>1</sup>, Jamel Ben Hani<sup>2</sup>; <sup>1</sup>LPE-CNRS, France; <sup>2</sup>Université Paris V, France

Time: Fri 19 3.00 pm, Stream: B Proc. Page: 256-256  
Venue: Burrows Lecture Theatre

Previous research indicates that musicians perceive music in a different way from non-musicians. In music synchronisation tasks musicians, compared with non-musicians: 1) spontaneously synchronise with higher hierarchical levels indicating a temporal organisation over longer time spans, 2) are able to synchronise with more hierarchical levels indicating more flexible attending, and 3) present more musically-appropriate synchronisations indicating greater understanding of musical structure. **Explicit music training** therefore contributes significantly to the elaboration of a more complex hierarchical mental representation. Similar changes with age are also observed, indicating that **maturational** or **developmental** factors also contribute to the elaboration of these skills.

In this paper we address the issue of whether or not **acculturation** - the passive exposure to a particular type of music since birth - also influences these skills. We do this by comparing synchronisation tasks with both Tunisian and French music for people from these two contrasting musical cultures. 32 participants were selected from each culture in the country of origin if they were completely unfamiliar with the other type of music. In each culture, half were musicians and half were non-musicians. Twelve musical excerpts were selected from the two popular music cultures, matched from perceived tempo, complexity and familiarity. If acculturation contributes significantly to the way people perceive music, we predict an interaction between musical culture and type of music: participants should synchronise at higher hierarchical levels with music from their own culture than with an unfamiliar type of music. Similarly, they should be able to synchronise with more hierarchical levels and in a more musically appropriate fashion.

Results confirm these predictions: familiarity with a particular type of music influences the way people synchronise with it, indicating that they perceive it in a different way. Thus both explicit musical training and passive acculturation influence our perception and cognition of music.