ACOUSTIC AND PERCEPTUAL COMPARISON OF SPEECH AND DRUM SOUNDS IN THE NORTH INDIAN TABLA: AN EMPIRICAL STUDY OF SOUND SYMBOLISM

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Introduction

Why do certain sounds we regard as “musical” in systematics and perception also represent speech in Asian music traditions? How do sound symbols map onto speech for nonmusicians? We attempt to address these questions by investigating the extent to which speech and drum sounds, which are rich and variable in their acoustic content, can be mapped onto each other. We compare a variety of musical and speech sounds and assess the extent to which listeners can map between the two domains.

Results: TUN vs TIN

Comparison: Spectral Centroids

- TUN: Centroid is higher for Tin than Tun in both drum and speech.
- TIN: Centroid is higher for Tun than Tin in both drum and speech.

Comparison: Fundamental Frequency

- TUN vs TIN: Fundamental is lower for TIN than for TUN in both drum and speech.

Comparison: Envelope decay time

- KAT vs GHE: Decay time is longer for GHE than KAT in both drum and speech.

Comparison: Interval between events

- TRA vs KRA: Interval is shorter for Tra than Kra in both drum and speech.

Perception Experiment

- Cross-cultural perception of phonetic sounds matches voice-to-drum sound?
- Do listeners perform at chance level on a forced choice task?

Perception Results

- Subjects perform above chance level on a forced choice task with pitches in the up.

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References


Future studies

- Cross-cultural perception of phonetic sounds used to represent symbolic drum sounds in other cultures (e.g., Chinese opera, Indian drumming).
- Cross-cultural investigation of cross-modal Leonardi phenomena (e.g., pitch to pitch).

Conclusions

- Individuals without knowledge of Indian music can match drum sounds and speech sounds in a simple, non-alternative form of a hit parlor.
- Additional studies only need a small set of stimuli.