

# Perceptual and performed accents in musical sequences

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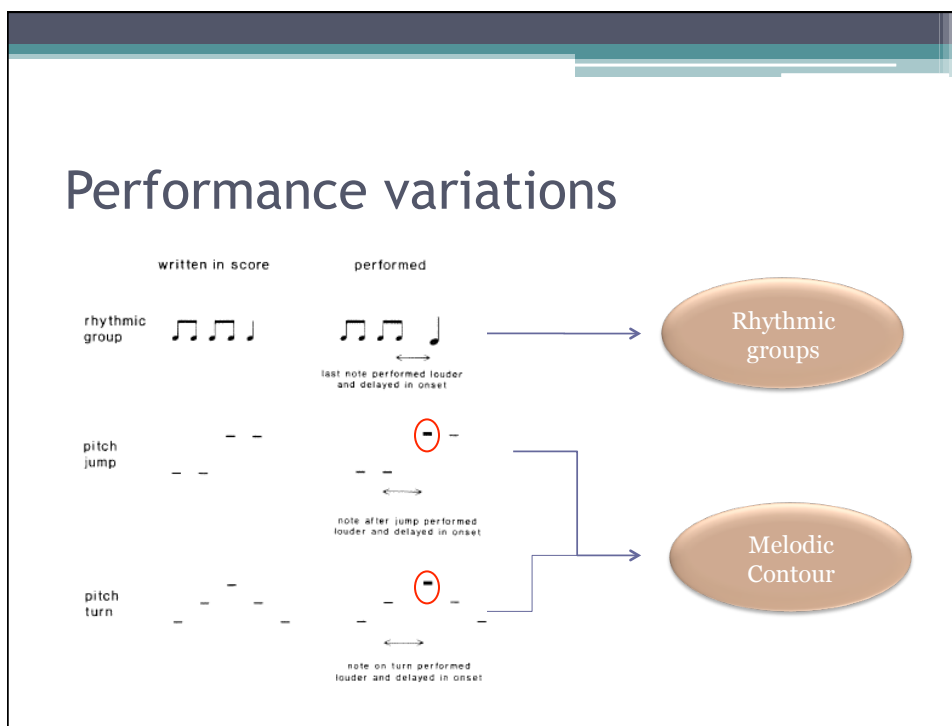
Presented by Ravi Nitin Balajee

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## Study with a difference

- Performance variations according to the performer
  - Notes may be played longer/shorter or louder/softer
- Performance variation as a result of constraints of auditory systems that influence the way both the listener and the performer perceive a sequence of auditory events
- Musical expression hypothesis: performer's particular musical interpretation conveyed to listener



## Limitations of Musical Expression Hypothesis

- Musical interpretation should be under voluntary control, but it is not.
  - Intensity variations disappeared but timing variations hardly decreased in mechanical performances.
- Timing variations observed in children and adults, but intensity variations absent in children. Intensity variation observed in adult musicians/non-musicians (Drake, 1990)

## Perceptual Hypothesis

- Playing events louder/softer or longer/shorter to compensate for hearing then softer/louder or shorter/longer
- Physical characteristics of a sequence do influence the ability to detect temporal changes within the sequence (*Halpern & Darwin, 1982; Hirsh, Monahan, Grant & Singh, 1990; Monahan & Hirsh, 1990*)

## Study experiments

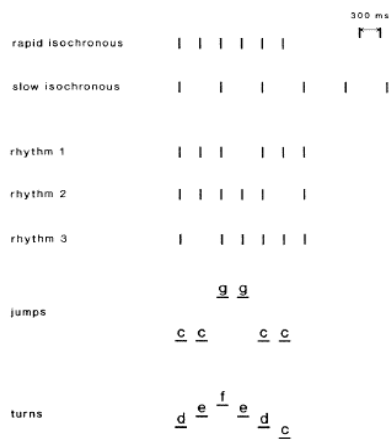


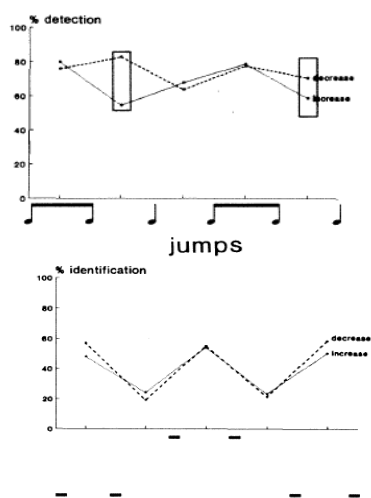
Figure 2. Stimuli used in Experiments 1 and 2.

- Study to identify the position of both timing and intensity variations in short, music-like stimuli in order to test perceptual hypothesis
- Hypothesis will be proved if sensitivity varies as a function of the physical characteristics of the sequence

## Experiment 1- to study timing

- Trials with five percentage increments on each of the five intervals
- 3 sets of blocks, each with trials containing increased and decreased intervals
- Percentage of detections and percentage of correct identifications measured. Both required correct identification of position of change

## Results



- **Isochronous sequences:** All subjects were easily able to detect the change and position
- **Rhythmic sequences:** Sensitivity to temporal changes lower in interval that precedes the long interval than in the other intervals
- **Melodic sequences:** Sensitivity to changes in duration of intervals before and after jumps and turns lower than changes in duration of other intervals

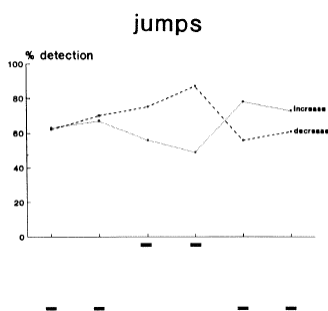
## Analysis

- Harder to detect and identify a decrease in the duration of interval preceding a long interval
- Harder to identify the position of a temporal change before a jump

## Experiment 2- to study intensity

- Subjects to indicate which tones in a sequence seemed louder or softer than others.
- 5 possible increments on six possible tones, total of 30 trials

## Analysis



- **Isochronous sequences:** No systematic differences were observed as a function of the position for slow or rapid sequences
- **Rhythmic sequences:** harder to detect and identify a change on longer interval following series of shorter interval
- **Melodic sequences:** Changes in the jumps (pos. 3 & 5) harder to detect and identify than other positions

## Conclusion

- Variations are related to the musician's desire to transmit a particular musical interpretation to the listener
- Variations do not entirely disappear when musician is asked to play in mechanical fashion
- Variations in sensitivity did not affect intensity and changes were observed in timing
  - Support for perceptual hypothesis is therefore obtained for timing variations but not for intensity variation.