

# Rhythm and Meter



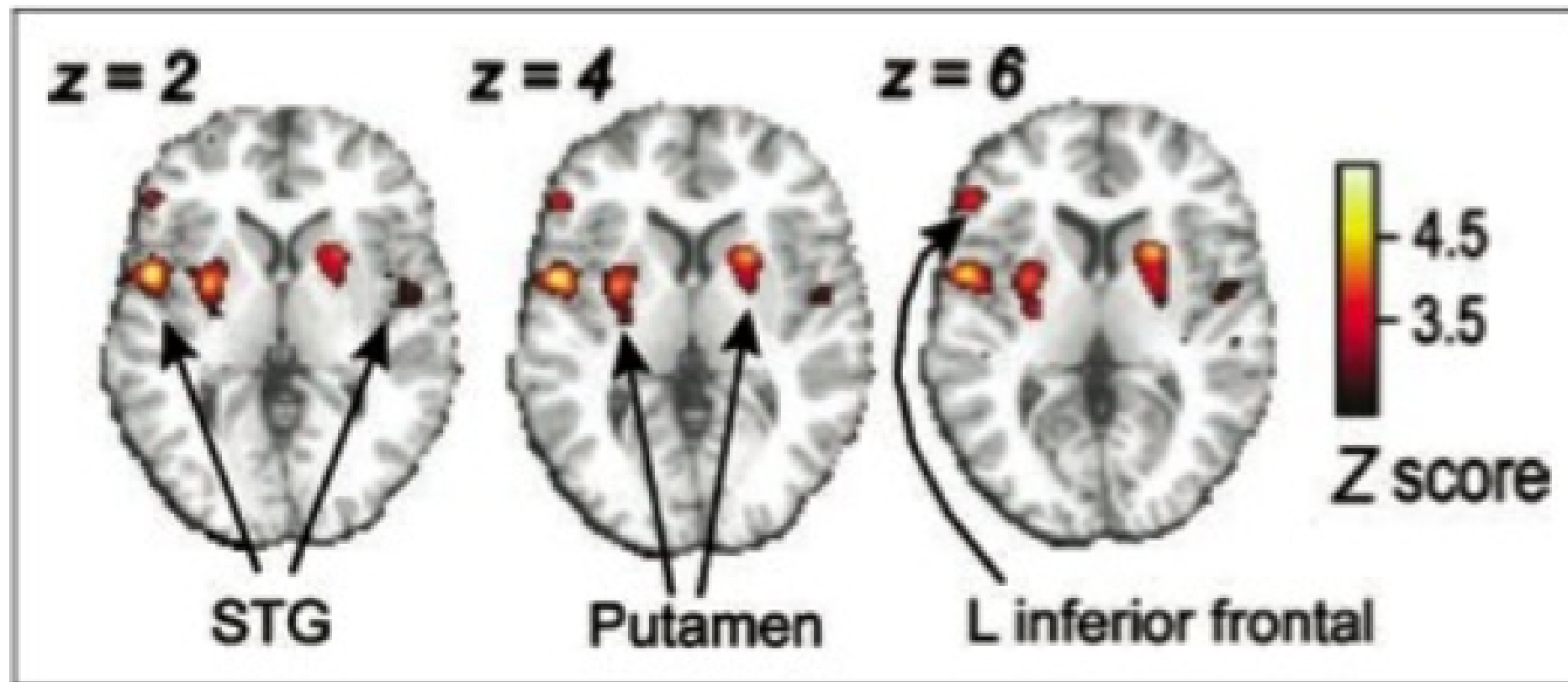
Mike Oldfield, Tubular bells, theme song for the Exorcist

Note Perception of groupings

# Beat

- Beat – underlying even pulse common in many types of music
- Range typical of that given on a metronome
  - **frequency** 30 to 200 beats/minute **OR** 0.5-4 Hz
  - **periods** between 250ms and few seconds.
  - For clicks closer together than 100 ms, they run together.
  - Separated longer than a few seconds we don't feel that they are associated
  - same range as sung vibrato or tremolo, or heartbeat
  - beats we *feel* are slower than frequencies we *hear*
- We tend to move spontaneously to the beat.
- Newborn babies respond to the beat (e.g. Winkler et al. 2009 – recent press on this, as seen from electric signals picked up near the brain).

Areas of the brain (as seen by fMRI (functional magnetic resonance imaging) respond to regular beats



**Figure 5.** Brain regions more active for metric simple than metric complex or nonmetric rhythms.  $Z$  score of 3.43 =  $p < .05$ , whole-brain corrected (FDR).

Grahn & Brett (2007), *Journal Cognitive Science* 19:5, 893