

Cheng Zhu

ISE 599

March 24<sup>th</sup>

Summary review of The Perception of Metrical Structure: Experimental Evidence and a Model by Christopher S. Lee

In the Model section, Lee describes a development procedure of the models in the Longuet-Higgins and Lee (1982) and Lee (1985). The model infers the metrical structure of a given sequence by going through the note sequence, comparing the successive note length and considering their positions respecting to the times of particular beats such as first beat within a bar. The output gives the time of the downbeat, the length of the bar, and the metre, which is all the necessary information for the sequence to be parsed. Actually there are four main differences between the new and the earlier model. First, the new model contains a pre-set variable, which determine how “tolerant” it will be of counter-evidence to its metrical hypotheses. Second, the new model is conservative about where the downbeat falls. Third, the new model is capable of metrical sub-division. Finally, the new one takes account of tempo effects. The revision model by adding a “tolerant” factor is to capture that listeners are more likely to avoid interpretations with both a (major) syncopation and a weak long note than those with only a weak long note. In the new model it also assumes initially that the downbeat occurs on the first note of the sequence and only shifts it onto a later note in the face of counter-evidence against the assumption to make the new model conservative about the location downbeat falls.

In the next section, basically Lee introduces a number of problems inside the new model and the ways solving the problem. The new model has the limitation on the size of the problem to be tackled, to the effect that the only metrical cue to be considered was that of relative note-length. It also has the limitation on absence of real-time considerations since listener has to build up a metrical interpretation in the course of listening to a sequence. The main problems in the model concern the subdivision routines and the limited scope of the evaluation and revision routines. The first concern in the subdivision is its inability to discover lower-level metrical groupings in cases where the lowest-established units contain no equal subdivisions or unequal intervals in a 2:1 ratio. The second problem concerns the subdivision routine application to units, which are equally subdivided into power (2,n) times power (3,m) intervals, where n and m larger or equal than 1. Besides these problems, there are several limitations on the evaluation and revision routines, such as incapability of evaluating the work of the subdivision routines or the effects of beat-length revision on the upbeat, and listeners would simply give up trying to find a suitable parsing when particular sequences happen during the revision routines. To solve these problems and limitations, Lee introduces parallelism method in which multiple parsings are carried out in parallel on all sequences. But some problem we have to solve first, such as to avoid inefficiency, real-time issue, etc.

In the final section, Lee tries to answer the question “why listeners should act in this way”. He suggest a hypothesis that there are some more general principle governing the pattern of listeners’ metrical inferences, which are regarding weak long notes and syncopations merely instantiate. It leads Lee a testable explanatory framework for future research.