

Ching-Hua Chuan

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Synopsis and Response Paper of The Perception of Metrical Structure: Experimental Evidence and a Model by Christopher S. Lee

The sections I read in this paper describe the development of models in Longuet-Higgins and Lee (1982) and Lee's (1985) works. Compared with earlier works, four major differences of the model which improve the capability of metrical structure perception are discussed. The model consists of repeating sequences of first establishing a hypothesis of metrical structure, revising and then confirming it according to the perception evidences. It also contains the capabilities of subdivision and of taking account of tempo effects. Problems of this model and reasons to the problems are given in later sections. Some remedies are then discussed. In the last part, Lee describes the bases of metrical interpretation from listener's perception evidences.

The first step of metrical grouping, which is similar to earlier models, is to calculate three hypothetical consecutive units, say t_1 , t_2 , and t_3 , and adjust them in various ways to obtain a satisfactory interpretation. Lee defines a score of counter-evidence to examine the satisfaction of interpretation. Some rules are developed for calculating counter-evidence score. For example, in the determination of downbeat, if t_2 is longer than t_1 , then the score of the hypothesis is 1. If the note at t_2 lasts longer than t_3 , then the score increases 1. Other rules are also generated in many other aspects, such as beat-length revision and metrical hypothesis confirmation. Lee extends the model for metrical subdivision by a searching and metre-finding routine. He includes tempo effects, another consideration of listener's choice of interpretation, in the selections of tactus and cut-off point.

Two problems of subdivision are addressed later and they are hard to solve, mainly because of lacking listener's perception evidences. For example, a subdivision is concerned with a case which contains the structure equally subdivided into $2^n 3^m$ intervals. It is difficult to choose between a binary or ternary subdivision. The limitation of evaluating the work of the subdivision routines or the effects of beat-length revision on the upbeat is presented. A remedy is suggested in the end of the discussion: parallelism.

This paper is an essential introduction to modeling of metrical structure perception. Many examples given in this paper acquaint readers with metrical structure analysis, including the information on how to construct metrical structure and to avoid unsatisfactory situations. This approach depends heavily on the listener's perception process of metrical structure which I have not read sufficiently. Therefore it is unclear and less convincing to me in certain inferences. For example, the choice of binary or ternary subdivision is hard to understand, and therefore, hard to evaluate.