

On a Hierarchical Rater Model for Essay Grading:
Incorporating a Latent Class Signal Detection Model

Lawrence T. DeCarlo

Teachers College, Columbia University

Abstract

Constructed response items, such as essays, must be scored by raters. In the present study, a model of rater behavior based on signal detection theory is incorporated into a hierarchical rater model. The signal detection model is the first level of the hierarchical model; it provides measures of the raters' tendency to be lenient or severe and their ability to discriminate between latent classes of essays. In the second level, the latent classes are used as ordinal indicators of examinee ability in an item response model. The approach separates rater effects from item effects. A simulation and an example with a large scale test are provided.