

Neural Test Theory

We propose a new test theory: the neural test theory (NTT). The model of this theory is based on the mechanism used in the self-organizing map (SOM), which is one of neural network models. In the NTT model, latent space is expressed as a stream of connected nodes like a chain. Therefore, this latent scale is not a continuous one but more like a rank-ordered one. The number of ranks is the same as the number of nodes and each examinee is ranked on the latent rank scale. The NTT model can be used to assess the probability of a correct answer with greater flexibility than nonparametric item response models. In addition, carrying out the computing required to obtain each item's response profile is very easy. Furthermore, this model can easily be upgraded to polytomous and multidimensional versions.