



逢甲大學統計學系

學術專題演講



Chia-Yi Chiu

Associate Professor

Rutgers, The State University of New Jersey

時間：108年06月24日 星期一 14:00-16:00

地點：商 1011 室(商學大樓十樓)

講題：Cognitive Diagnosis in Classroom: The General Nonparametric Classification Method

Abstract

Cognitive diagnosis (CD) in educational testing seeks to provide immediate feedback to students on how well they have mastered the instructional content. Ability is perceived as a composite of specific cognitive skills, called attributes, each of which an examinee may or may not have mastered. The entire set of binary attribute profiles defines classes of proficiency to which students are assigned.

The application of the CD framework to the analysis of large-scale educational data sets is rather well-researched. Sample sizes of typically thousands of examinees readily allow for maximum-likelihood estimation of even the most sophisticated cognitive diagnosis model (CDM). However, the application is rather difficult if a researcher wants to use the CD framework for assessing students' performance at the class or course level. The small sample sizes do not permit using the statistical estimation techniques that have been so successfully applied with large-scale assessment data. More to the point, the extant technical limitations currently prohibit the application of the CD framework in educational micro environments, where teaching is actually happening, and where immediate and detailed feedback to the students would be most beneficial. The nonparametric classification (NPC) method (Chiu & Douglas, 2013) was developed as a tool for CD-based data analysis when only sample sizes are available that do not involve hundreds or thousands of examinees. But the NPC method is currently only available for the Deterministic Input, Noisy output, "And" gate (DINA) model (Junker & Sijtsma, 2001) and the Deterministic Input, Noisy output, "Or" gate (DINO) model (Templin & Henson, 2006). Hence, a general nonparametric classification (GNPC) method is proposed for use with small-sample data and a broader scope of CDMs beyond just the DINA and the DINO model: the entire class of general CDMs (de la Torre, 2011; Henson, Templin & Willse, 2009; von Davier, 2005).

This presentation will focus on the rational and the theoretical justification of the GNPC method. For audience who are interested in the details of the method, please refers to the following related papers.

Chiu, C.-Y., & Köhn, H.-F. (in press). Consistency theory for the general nonparametric classification method. *Psychometrika*.

Chiu, C.-Y., Sun, Y., & Bian, Y. (2018). Cognitive diagnosis for small educational programs: The general nonparametric classification method, *Psychometrika*, 83, 355-375..

敬請張貼

洽詢電話：(04)24517250 轉 4405 傳真：(04)24517092

大學