# 量表發展之理論與應用

# Scale Development: Theory and Application

**Fall 2009 Course Syllabus**
**Department of Business Administration**
**National Central University**

Version0907

**The Course**

Semester: Fall 2009
Time: Monday 18:00 – 21:00
Course Type: Lecture and Discussion
Course Units: 3.0
Lecture and Lab Room: I1-303 and personal Lab
Restriction: Graduate students only

**The Instructor**

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## ■Purpose

有別於實驗儀器，量表、測驗或問卷是社會科學研究的重要工具，同時也是人資實務（人事甄選、職能評估、績效衡鑑）、市場調查、組織發展的重要手段。一個好的量表與評量工具的發展，必須建立在厚實的理論與邏輯基礎、縝密的規劃與控制、精密的題目分析、完整的信效度評估、分數系統與常模的建立，才能達成測量與評鑑的目的，發揮管理與應用實效。同時也必須與資料分析與統計決策緊密結合，才能受益於科學客觀實證的優勢。因此，本課程的主要目的在介紹心理測驗與量表的基本概念，並配合測量工具發展實作練習，使學生能夠熟悉測驗與量表的特性，並能夠實際操作編製過程，應用統計方法來診斷量表優劣，並進行應用。

## ■Objectives

This course introduces the fundamental concepts and advanced application of statistical techniques on the scale development, with a special emphasis on the training of the analytic tools and operational skills for test development. A completed conceptual section of introduction to test development along with the empirical exercise/study using real data will be the core of the course. Besides, this course requires a great amount of computer lab activities for expanding beyond basic concepts of test development to include more operational skills. That is, the dual-objective of this course is to provide a sound conceptual understanding on the usage of psychological tests, and to provide hands-on experience with major software packages for test development. Specific objectives this course seeks to accomplish are as follows:

1. To understand the basic principles of psychological testing and evaluation, as a follow-up course of the Advanced Measurement Theory;
2. To understand the recent development of use of psychological testing and evaluation in both academic and practical settings;
3. To become master of the usage of statistical software packages for test development by applying both theoretical knowledge and analytic skills to practical research situations within one's own research area;
4. To analyze real data using software programs, e.g., SPSS, AMOS, MPLUS; and to propose a complete paper on the basis of precise statistical language

## Class Activities and Assignment

**Scale development project and presentation**

This course requires students to complete a study for test development as a final report and conduct several separate short homework in correspondent to the class materials for each lab week. All students in this class are anticipated to work together to collect real data and to create a sample at least 100 cases. A complete report is expected to be oral presented in the conference at the end of the semester. The short homework consists of the following pieces:

**Part 1:** Plan of scale development and Item pool
**Part 2:** Item analysis and Reliability estimation
**Part 3:** Validation evaluation

## Grading

Class participation (attendance, class interaction, after-class discussion).10%
Oral presentation (familiarity with the topic, clarity of summarization, reflective thinking) 40%
Final term paper (including the computer lab homework and presentation in conference) 50%

## Textbook and references


邱皓政 (2006)。「量化研究與統計分析-SPSS 中文視窗版資料分析範例解析」(第三版)，台北：五南圖書公司。

邱皓政 (2003)。「結構方程模式—LISREL 的理論、技術與應用」。台北 ：雙葉書廊。

邱皓政 (2008)。「 潛在類別分析的原理與技術」。台北：五南圖書公司。

DeVellis, R. F. (2003). Scale development (2nd Ed.). CA: Sage.

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). Scaling procedures: Issues and applications. CA: Sage.

Dave Bartram & Ron Hambleton (2005). Computer-Based Testing and the Internet: Issues and Advances. Wiley


# Class Schedule

## Fall 2009

Revised at 09/01/2009

| WEEK | TOPICS & ACTIVITIES | | LAB & HOMEWORK |
|---|---|---|---|
| 1<br>9/14 | Class introduction: Why we need tests and/or scales<br>課程簡介 | NCU | - |
| 2<br>9/21 | Measurement theory and development<br>測驗理論與測驗發展 | NCU | - |
| 3<br>9/28 | Regulation of test use and development<br>測驗使與發展規範 | NCU | 1: Project plan |
| 4<br>10/05 | Latent Modeling Technique<br>潛在變數理論與技術 | αβγ | 2: Literature |
| 5<br>10/12 | Reliability<br>信度 | αβγ | 3: Item pool |
| 6<br>10/19 | Validity<br>效度 | αβγ | 4: Questionnaire |
| 7<br>10/26 | Norm and scale development<br>常模與數量系統的發展 | αβγ | 5: Data collect |
| 8<br>11/02 | **《Conference meeting: No class》** | | 6: Electronic |
| 9<br>11/09 | Item Analysis<br>項目分析 | αβγ | 7: SPSS run |
| 10<br>11/16 | Exploratory Factor Analysis<br>探索性因素分析 I: 主成分與主軸法 | αβγ | 8: SPSS run |
| 11<br>11/23 | Exploratory Factor Analysis<br>探索性因素分析 II: 平行分析法與 MAP 法 | αβγ | 9: SPSS run |
| 12<br>11/30 | Confirmatory Factor Analysis<br>驗證性因素分析 | αβγ | 10: SPSS run |
| 13<br>12/07 | Reliability estimation in SEM<br>結構方程模式中的信度估計 | αβγ | 11: SEM run |
| 14<br>12/14 | Validity evaluation in SEM<br>結構方程模式中的效度評鑑 | αβγ | 12: SEM run |
| 15<br>12/21 | Latent class modeling and scale development I<br>潛在類別模式在測驗發展的應用 | αβγ | 13: LCA run |
| 16<br>12/28 | Latent class modeling and scale development II<br>潛在類別模式在測驗發展的應用 | αβγ | 13: LCA run |
| 17<br>01/04 | Common Method Variance and Method effects<br>共同方法變異與方法效應 | αβγ | |
| 18<br>01/12 | **《Final review: Individual discussion》** | | Oral Report II<br>**(Final due at 01/19)** |

# Reading Schedule Fall 2009

Revised at 09/14/2009

| WEEK | TOPICS & READINGS |
|---|---|
| 1 9/14 | Class introduction: Why we need tests and/or scales 課程簡介 |
| 2 9/21 | Measurement theory and development 測驗理論與測驗發展<br><br>Jones, L. V., & Thissen, D. (2007). A history and overview of psychometrics. In C.R. Rao and S. Sinharay (Eds.) Handbook of Statistics, Vol. 26: Psychometrics, (pp. 1-27). Elsevier Science B.V.: The Netherlands. |
| 3 9/28 | 測驗發展與測驗規範<br><br>Hinkin, T. R. (1998). A Brief Tutorial on the Development of Measures for Use in Survey Questionnaires. Organizational Research Methods, 1(1), pp. 104 -123.<br><br>Turner, S. M., DeMers, S. T., Fos, H. R., & Reed, G. M. (2001). APA's guidelines for test user qualifications. American Psychologists, 56(12), 1099-1113. |
| 4 10/05 | Latent Modeling Technique 潛在變數理論與技術<br><br>Noar, S. M. (2003). The role of structural equation modeling in scale development. Structural Equation Modeling, 10, 622-647.<br><br>Ding, C. S., & Hershberger, S. L. (2002). Assessing content validity and content equivalence using structural equation modeling. Structural Equation Modeling, 9(2), 283–297. |
| 5 10/12 | Reliability 信度<br><br>Webb, N. M., Shavelson, R. J., & Haertel, E. H. (2007). Reliability and generalizability theory. In C.R. Rao and S. Sinharay (Eds.) Handbook of Statistics, Vol. 26: Psychometrics, (pp. 81-124). Elsevier Science B.V.: The Netherlands. |
| 6 10/19 | Validity 效度<br><br>Borsboom, D., Mellenbergh, G. J., van Heerden, J. (2004). The Concept of Validity. *Psychological Review. 111(4):1061*-1071.<br><br>Brackett, M. A., & Mayer, J. D. (2003). Convergent, discriminant, and incremental validity of competing measures of emotional intelligence. *Personality and Social Psychology Bulletin, 29*, 1147-1158. |
| 7 10/26 | Norm, scale development, and internet 常模與數量系統的發展與網路測驗<br><br>Naglieri, J. A., Drasgow, F., Schmit, M., Handler, L., Prifitera, A., Margolis, A., & Velasquez, R. (2004). Psychological testing on the internet: New problems, old issues. American Psychologist, 59(3), 150-162.<br><br>Meade, A. W., Michels, L. C., & Lautenschlager, G. J. (2007). Are Internet and Paper-and-Pencil Personality Tests Truly Comparable? An Experimental Design Measurement Invariance Study. Organizational Research Methods, 10(2), 322-345. |
| 8 11/02 | **《Conference meeting, No class》** |
| 9 11/09 | Item Analysis 項目分析<br><br>Kreuter,F., Yan, T., Tourangeau, R. (2008). Good item or bad—can latent class analysis tell?: the utility of latent class analysis for the evaluation of survey questions. Journal of the Royal Statistical Society: Series A (Statistics in Society). 171(3), 723-738.<br><br>邱皓政 (2006)。「量化研究與統計分析-SPSS 中文視窗版資料分析範例解析」(第三版)，台北：五南圖書公司。 |

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| 10 11/16 | Factor analysis 因素分析<br><br>Henson, R. K., & Roberts, J. K., (2006). Use of Exploratory Factor Analysis in Published Research: Common Errors and Some Comment on Improved Practice. Educational and Psychological Measurement, 66(3), 393-416.<br><br>邱皓政(2010)。因素分析(第 19 章),社會及行爲科學研究法第二版,台北:東華書局。圖書公司。 |
| 11 11/23 | Exploratory Factor Analysis 探索性因素分析 II: 平行分析法與 MAP 法<br><br>Hayton, J. C, Allen, D. G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor anlysis: A tutorial on parallel analysis. Organizational Research Methods, 7(2), 191-205. |
| 12 11/30 | Confirmatory Factor Analysis 驗證性因素分析<br><br>邱皓政 (2003)。「結構方程模式—LISREL 的理論、技術與應用」。台北 :雙葉。 |
| 13 12/07 | Reliability estimation in SEM 結構方程模式中的信度估計<br><br>邱皓政 (2003)。「結構方程模式—LISREL 的理論、技術與應用」。台北 :雙葉。 |
| 14 12/14 | Validity evaluation in SEM 結構方程模式中的效度評鑑<br><br>MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The Problem of Measurement Model Misspecification in Behavioral and Organizational Research and Some Recommended Solutions, Journal of Applied Psychology, 90( 4), 710–730.<br><br>Howell, R. D., Breivik, E., & Wilcox, J. B. (2007). Reconsidering formative measurement. Psychological Methods. 2007, 12(2) 205-218 |
| 15 12/21 | Latent class modeling and scale development I 潛在類別模式在測驗發展的應用<br><br>Kreuter,F., Yan, T., Tourangeau, R. (2008). Good item or bad—can latent class analysis tell?: the utility of latent class analysis for the evaluation of survey questions. Journal of the Royal Statistical Society: Series A (Statistics in Society). 171(3), 723-738.<br><br>Lubke, G., & Neale, M. C. (2006). Distinguishing Between Latent Classes and Continuous Factors: Resolution by Maximum Likelihood? Multivariate Behavior Research, 41(4), 499–532.<br><br>邱皓政 (2008)。「潛在類別分析的原理與技術」(繁體)。台北:五南圖書公司。 |
| 16 12/28 | Latent class modeling and scale development II 潛在類別模式在測驗發展的應用<br><br>Birkelund, G. E., Goodman, L. A., & Rose, D. (1996). The latent structure of job characteristics of men and woman. American Journal of Sociology, 102(1), 80-113.<br><br>邱皓政 (2008)。「潛在類別分析的原理與技術」(繁體)。台北:五南圖書公司。 |
| 17 01/04 | Common Method Variance and Method effects 共同方法變異與方法效應<br><br>Spector, P. E. (2006). Method Variance in Organizational Research: Truth or Urban Legend? Organizational Research Methods, 9(2), 221-232.<br><br>Kline, T. J. B., Sulsky, L. M. (2000). Common method variance and specification errors: A practical approach o detection. Journal of Psychology, 134(4), 401-421. |
| 18 01/13 | **《Final review: Individual discussion》** |