Latent Class Analysis in Social Science Research

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Syllabus

0. Resources for course.

1. Where does latent class analysis (LCA) come from? – LCA’s roots in classification in various sciences and start-up examples.

2. What is a mixture of distributions? – Mixture settings with examples, and specific aims of LCA.

3. Basic statistical concepts of relevance to LCA.

4. What is latent variable modeling (LVM), how is it related to LCA, and why is LVM relevant for LCA?

5. An important classification of latent variable models – LCA’s connections to major applied statistical modeling frameworks in the social sciences and how they are beneficial for empirical researchers.

6. Why traditional cluster analysis is limited, cannot in general accomplish the classification aims to a satisfactory degree, and why LCA can do (much) better?

7. LCA as a model-based clustering methodology for the social sciences, and how to carry out LCA in empirical research – A generally applicable methodological strategy.

8. LCA in cross-sectional studies
   - mixture regression analysis (latent profile analysis),
   - LCA with discrete observed variables,
   - how to interpret LCA solutions,
   - LCA with covariates,
   - what if things go wrong? – common difficulties when using LCA in empirical research,
   - mixture structural equation modeling,
   - multiple latent class variable models,
   - LCA models with residual dependencies,

Addendum: Can I drop a latent class indicator(s)?
9. LCA in longitudinal research (growth mixture modeling)
   - individual temporal development trajectories,
   - unconditional growth mixture (GM) analysis,
   - conditional GM analysis,
   - using LCA to study delayed (distal) outcomes,
   - LCA with nationally representative studies,
   - possible numerical difficulties in LCA applications in GM analyses (and beyond) and how to deal with them.

10. LCA applications in social measurement and scale (instrument) construction and development
    - measuring instrument reliability and validity in heterogeneous (mixture) populations (incl. coefficient alpha related discussion),
    - mixture item response theory/modeling.

11. Extensions, practical issues, and related current limitations of LCA in empirical social science research.

12. Conclusion.