An Introduction to Latent Class Analysis

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Latent Class Analysis

- Very general idea: the population of interest consists of different subgroups (<u>classes</u>), but these are unobserved (<u>latent</u>)

- Applications: clustering, building typologies, measurement, unobserved moderation

- Statistical translation: unobserved groups (latent classes) differ in parameter values of the specified model

- LC model is also called mixture model

- Its use is usually more exploratory than confirmatory

Three typical steps/goals of a LC analysis

1. Build a clustering model based on a set of observed variables
    - How many classes do we need?
    - How should we interpret/label the classes/clusters we identified?

2. Classification
    - To which cluster does one belong given the values on the observed variables?

3. Relationship between classes and external/other variables
    - What is the association between classes and other variables?
    - Can we predict class membership with other variables?
    - Does class membership predict/affect other outcomes?

Example: symptoms of depression

1. Build a clustering model based on the observed symptoms
   - How many symptom clusters do we need?
   - How should the symptom clusters be labeled?
2. Classification
   - To which symptom cluster does someone belong given the observed symptoms (s)he has?
3. Relationship of classes with external variables
   - Is there a difference in cluster memberships between males and females?

Next: an illustration with Latent GOLD using "depression.sav"

Next videos on latent class analysis

- Model formulae, assumptions, and maximum likelihood estimation
- Model selection statistics, their use and their formulae
- Classification and classification statistics
- Relating latent classes to external variables: one-step and three-step approaches
- Extensions of the basic model: local dependencies, other scale types, longitudinal data, etc.

Reading: Magidson & Vermunt (2004) or updated version from 2019