Using Construct Map with Real Data and for the First Time

November 5th
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Using ConstructMap

0. Open ConstructMap
1. Open your data
2. Estimating item parameters
3. View the reports
Opening ConstructMap

- Downloading the installer
- Looking for documentation
- Installing the application
- Opening ConstructMap
http://bearcenter.berkeley.edu/ConstructMap/
**Downloads** section of the site.

Windows and OS X installers available.
Documentation section of the site.
User guide, wiki, textbook materials and exercises.
The installer default folders:

- In Windows 32 bits
  - “C:\Program Files\ConstructMap46 beta”

- In Windows 64 bits
  - “C:\Program Files (x86)\ConstructMap46 beta”

- In OS X
  - “/Applications/ConstructMap46 beta”
The ConstructMap login screen.
User name: admin - Password: bear
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Opening your Data

- Cleaning your Data
- Recoding your Data
- Saving your Data
- Opening your Data
Important!

- Always keep a copy of your original data.
- Keep track of any ‘fixes’ or recoding that you do to your data.
Data Cleaning

- **Data Analysis 101**: Start with descriptive statistics!
- Before we start... **data file format**.
- You want to look for:
  - Invalid values/responses
  - Category frequencies
  - Missing categories
  - Item/covariate cross-tabulations
Data Recoding

- How to recode data?
  - **Not by using “Search and Replace”**!
- Please keep a record
  - If you use Excel, use formulas.
  - If you are familiar with a data analysis package, use that.
Data File Format

ConstructMap’s import wizard can only open MS Excel 2003 format:

- *my_data_file.xls* will work.
- *my_data_file.xlsx* will NOT work.
- *my_data_file.csv* will NOT work.

You can also save in ConstructMap native format, but we will go over that later.
The ConstructMap import wizard.
Open File dialog.
Notice that only the .xls file is available by default.
Open File dialog.
Usually you should select the option at the bottom.
The table below shows a preview of the data to be imported from your Excel spreadsheet. Please review the table and indicate the purpose of each column (as the respondent ID, a case-level variable (e.g., for grouping), or an item) by clicking the appropriate radio button in each column.

Preview Import Data Screen.
Notice that the screen lists all the variables by names, **three possible categories for each of them** and shows a preview of the values of each.
There can be only one *Respondent ID* variable. The first variable is selected by default.
The remaining variables are by default selected as Item. The first variable is selected by default.
You need to manually mark the *Case-level variables* (i.e. covariates). The first variable is selected by default.
The program will remind you that recoding may have occurred. Press Finish.
You are all set with the data import. ConstructMap is now ready.
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Estimating Item Parameters

- Selecting a Measurement Model
- Keeping / Resetting Parameters
- Estimating Item Parameters
You can change calibration options in this menu. The default measurement model, the Partial Credit Model should be fine for most purposes in this class. In other words, you can actually leave this alone.
Under most circumstances, you can go directly to the *Compute Item Parameters* or simply press F7.
Inside *Compute Item Parameters* you can simply press OK in order to run a simple analysis. The *Item Set* only comes into play for more advanced analysis.
If you get this warning, feel free to ignore it most of the time. If this is one of your first analysis, it is OK to dismiss it without worries.
This window will appear while the estimation algorithm is working. If your dataset is small, you may not be even able to see it.
This is the confirmation dialog when the estimation algorithm is finished. Press *Yes* in order to save the newly estimated parameters.
After saving the results the program will show this progress window while calculating fit statistics. The amount of time this takes will vary with the size of your dataset.
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Viewing the Reports

- Finding the correct report
  - Groups
  - Individuals
  - Items
- Saving the reports
Let’s start with the *Group Reports*. For the time being you should focus on three basic reports: *Frequency Map*, *Ability Estimates* and *Ability Estimates with Fit Statistics*.
Group Reports

- **Frequency Map** (Graphical Report)
  - Produces a histogram of persons’ proficiencies.

- **Ability Estimates** (Text Report)
  - Produces a table with each persons’ proficiency and their standard error.

- **Ability Estimates w/Fit Statistics** (Text Report)
  - Produces a table with each persons’ proficiency and their standard error and **person fit statistics**.
There are also three basic reports in Individual Reports. Diagnostic Map, Graphical Diagnostic Map and Responses Report.
When using *Individual Reports* it is important to note that you need to select a person before producing a report. You select a person by clicking in the student tab.
Once in the student tab, click in the row of the person that you want to select to activate it. In this case we are selecting person number 10.
Individual Reports

- **Diagnostic Map** (Text Report)
  - Produces a fit diagnostic map for the selected person.

- **Graphical Diagnostic Map** (Graphical Report)
  - Produces a graphical fit diagnostic map for the selected person.

- **Responses Report** (Text Report)
  - Produces a table indicating the response selected in each item by the selected person.
You will probably use most of the reports in the *Item Reports* section.
Individual Reports

- **Wright Map** (Text Report)
  - Produces a person-item map.

- **Graphical Wright Map** (Graphical Report)
  - Produces a graphical person-item map.
Graphical Wright Map
Individual Reports

- **Classical Item Statistics** (Text Report)
  - Produces a report with response frequencies, biserial correlations, fit, steps and thresholds.

- **Item Estimates and Fit Graphs** (Text Report)
  - Produces a table indicating item and category parameters and an item fit diagram.

- **Fit Graph of Items** (Graphical Report)
  - Produces a graphical version of the item fit plot.
Fit Graph
Individual Reports

- **SEM Graph** (Graphical Report)
  - Produces a graph of the Standard Error of Measurement as a function of ability.

- **Test Information Curve** (Graphical Report)
  - Produces a graph of Test Information as a function of ability.
Standard Error of Measurement Graph
Individual Reports

- **Item Characteristic Curve** (Graphical Report)
  - Produces a graph that shows the probability of each response category as a function of ability.

- **Item Cumulative Probability Curve** (Graphical Report)
  - Produces a graph that shows the cumulative probability of each response category as a function of ability.
Item Characteristic Curves
Cumulative Probability Curves
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