Consulting Client Meeting with S.Agasi

Summary of the statistical problem

Y. Lu[1]

[1]Department of Statistical Sciences
University of Toronto

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Outline

Background

- This is a research project for the Organizational Behaviour and Human Resource Management department at the Rotman School of Management.
- The main goal of this project is to study how people's emotions and state of mind affect the impression they make one others. (In particular, the client is interested in the job fair setting.)

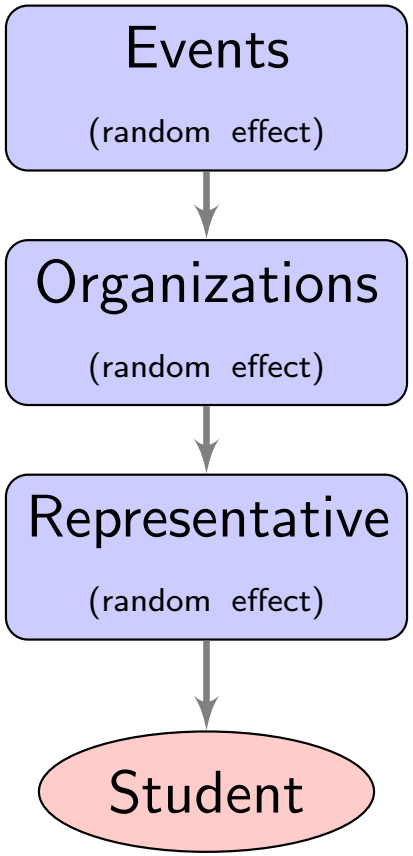
Background

- The Management program at the University of Toronto Scarborough campus hosts seasonal networking events to assist their co-op stream students with finding placements.
- From results of previous studies, the client suspects students with better moods at the beginning of the event tend to leave better impressions.

Collection

- Data collected over two years. (Include about 20+ job fairs.)
- Before each event, students were asked to fill out a standard survey accessing their state-of-mind.
- After the event, students are asked about:
  1. which organization they spoke with during the event
  2. the order of organization visited
  3. the approximate length of conversation
  4. the impression they think they made on the representative
- After each event, the representatives of the organizations present were asked to:
  1. List the students they remember conversing with.
  2. Give an impression score [-2,2] for each student.

Collection


Events
(random effect)
Organizations
(random effect)
Representative
(random effect)
Student

Issues

- There is a lot of missing data.
  1. Each networking event in the study have organizations that did not respond to the survey.
  2. Of the organizations that did respond, not all its representatives reponded.
- Since each representative could have spoken with different students, the assumption that the data is missing at random is invalid. Imputation is not applicable.

Statistical Objectives

- The statistical objectives are as follows:
  1. Determine, whether the state-of-mind of the student before the networking event have any effect on the impression he/she makes on representatives.
  2. Determine, whether the order the student visits organizations affects how he/she is perceived.
  3. Deal with the large amounts of missing data.
  4. Simplify the model.

Statistical Methodology

To model the hierarchical nature of the data we consider a mixed-effects model.

$$y_{i(jkl)} = (u_{0(j00)} + v_{(0k0)} + w_{0(00l)}) + x^T\beta + e_{i(jkl)} \qquad (1)$$

where,

$i = student, \quad j = represenatives, \quad k = organizations, \quad w = events$

This model contains four random components:

- The effect of the j^{th} representative $u_{0(j00)}$
- The effect of the k^{th} organization $v_{0(0k0)}$
- The effect of the l^{th} event $w_{0(00l)}$
- and the residual component $e_{i(jkl)}$.

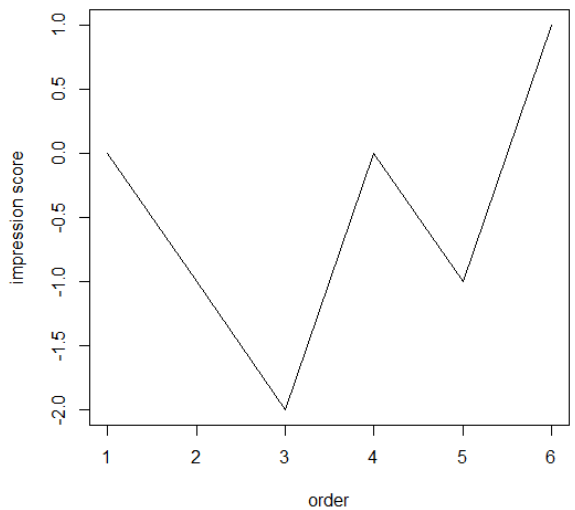
Statistical Methodology

Order of organization visited

To assess whether the order of organizations visited matter, we will model the order as a continuous variable.

- NOTE: The total number of organizations visited differ with each student.

For each student we will have:



Statistical Methodology

Order of organization visited

Then to assess the effect of order on impression, we just need to include order as one of the covariates in the above hierarchical model.

Questions

- How should I deal with the missing data?
- How can I account for the "over-lapping" nature of the data?
  1. Perhaps consider cross-level interactions?