New thesis:

A validity check of utilizing social network methodology on an adolescent population

Summary:

The purpose of this thesis project is to help validate the adolescent responses to the social network data from the William T. Grant project. Adolescents were asked to choose those that they felt they had a relationship with other mentees and staff members within the program across 5 timepoints. Therefore, the goal of this project is to track the validity of each of their responses to these items across the 5 time points. A series of ‘trustworthiness’ checks will be performed on the edgelist of the adolescent mentee data. Specifically, some of the proposed methods to validate the network data include:

1. Comparing the selection and weight differences. For example, if a mentee is consistently choosing people at very high weights and the receiver is not rating them at the same level (or not at all) this is indication of an error.
2. We will look at measures of survey misuse, we can even look at other measures and see if there are checks of misuse throughout the survey
3. Additionally, looking at the changes in individuals over time. For example, does a mentee match the “normal” progression of the growth in a network?
4. Finally, a composite score can be created. It will be a combination of all of the scores and a percentage of ‘trustworthiness’ will be calculated. Individuals will have individual scores and an overall percentage of trustworthiness can be calculated.

In summary, these checks are *not* meant to create a final decision of data quality. However, the purpose is to help guide researchers, including me, working with our specific data know the quality of the data. It is an honest review of the data quality within the adolescent population of Campus Connections. This can help us answer many research questions. For example, what if there is a difference in quality in age ranges? Maybe there are certain qualities of an adolescent that makes them less likely to give serious and reliable data within the social network aspect of the data. The researchers we provide this data to will be able to make a decision on removing observations and ensure *they* are making informed decisions before proceeding to analyses. Furthermore, we can make conclusion about the data ourselves. If the data is perceived as quality for our purposes, I can continue with validating it more by adding convergent and discriminant validity measures. Then, finally, we can utilize this data to better analyze outcomes.

At the end of this project, I hope to make this utilizable not only for the adolescent data, but towards any network data overall. This can by creating a custom set of functions, that can be manipulated to any data in edgelist form. Potentially an entire package, with goals to upload it to the Comprehensive R Archive Network (CRAN).

Note with Kim

* Could you reconcile these “bad” individuals with other
* Experiencing the trustworthiness check
* Can I develop a trustworthiness scale. That meaningfully tells us about the trustworthiness.
* Getting real isolates vs non-real isolates
* Survey length time
* Comparison with other questions as an indication of untrustworthiness.

Sitting with a kid and probing them

Talking with Rachel graham

* About the iear data
* Identify the problem kids and non-problem kids

Michael Thomas - Look at his vita

* Expertise is in neuro assessment

Notes with Bailey:

Verifying this network measure:

* Imagine that you put someone to observe CC
  + Observed friendships
* Imagine you given the mentors to ask who the mentees have a relationship.
* IS this a tool that can be reliably?
  + What percentage seems to be wrong?
* Give out a survey in which they try to describe their mentees
* What happens if a mentee
* Create confidence measures
  + MIT social evolution dataset
* Rephrase question:
  + What other data did we collect that is repetitive of the SN data.
  + What does the this data have in common with these measures.
  + What network does this
* Consider just expanding the first question.
  + Looking at the connections over time. Flagging students at certain weeks.
* How many ways can we get at validity
* Put it into different parts
  + How can we identify problem adolescents
  + Can we identify survey fatigue?
  + What are the types of survey misuse.
  + Look at reciprocated relationships

Creating ranks for the weights scores and creating a similarity score.

Look up a similarity index for weights

Get validity for networks

Do these different validity methods all coincide with eachother.

Look if research on adolescents

Bailey:

What methods do we have to validate social network measures? We want to be sure that the social network data works

How can we be sure that the sn data from adolescents?

Use same terminology that we use measurement.

I am interested in taking the principles of social networks and incorporating them into social networks

Do you need to be concerned about network dynamics when your not worried about tie formation.

She’s worked on a adolescent network study.

Do kids likely choose the more popular kids?

Look with valentes work on interventions research.

Methods papers associated:

How can we for the correct measurements.

Is there an analog measure

**Outline:**

* 1. Explain the importance of studying at-risk adolescence
     1. The changing, influential and plastic adolescent brain (Many references in steinberg book; Costa-Robles, Caspi)
        1. Highest risk for risky health behaviors (drugs, unprotected sex, pregnancy, etc.)
     2. Adolescent behaviors serve as a good indicator of adult behaviors.
        1. Therefore, intervention is key (Dubois)
        2. Theory of life course persistence (Moffit)
     3. Importance of positive influence in adolescence (Erdem)
        1. Mentorship is a strategy to provide positive influences (Rhodes, DuBois)
        2. Rhodes Model of Youth mentorship (Rhodes, Dubois, et al.)
     4. Theories regarding adolescent research
  2. Social Network Analyses
     1. A general description
        1. Key terms: Density, inbound relationships, outward bound, reciprocity
     2. It’s usefulness in social science research
        1. Group influences have been studied in past research (Peer contagion, Latene’s social impact theory)
     3. It’s usefulness in health research and an indicator of health outcomes (Valente)
        1. Importance from a public health perspective
     4. The complexity of gathering data and analyzing
     5. Veenstra (2013) that the combo of incoming and outgoing ties is a sign of social status.
  3. Adolescents and their network
     1. Adolescent peers’ behaviors are a good indicator of their own behaviors (Dishion, Tipsord)
     2. The evolution of adolescent networks is not widely understood.
        1. Most studies take a cross sectional approach to understanding the network (Dubois)
        2. However, there are studies out there that support it being an applicable methodology: RSIENA models (snijders, valente, Veenstra)
     3. Peer contagion, deviancy training (Dishion)
  4. Understanding belongingness
     1. Define belongingness
     2. Indicate the extent to which belonging matters
     3. Wilms belongingness study
        1. Sense of belonging is affected by students’ experiences in community and school experience
        2. 1 in 4 students in developed countries have a low belongingness in school. Which in turn is shown to affect participation.
  5. Campus Connections
     1. Provide description of program
        1. Mentor family mentorship style
        2. Schedule and dosage of exposure to program
        3. Importance to the Fort Collins communities (and other communities is serves)
        4. Evidence-based approaches
     2. Past research (Henry, Haddock, Weiler)
        1. Benefits towards mentors, staff & youth (Weiler, Haddock)
     3. Unique, structured platform to perform research
     4. Description of the social network
        1. Longitudinal data
           1. Which is a huge benefit to this thesis
     5. Veenstra articles to describe how peer networks have been observed in adolescent populations.
  6. Dissect social network analysis as a field
     1. Selection vs influence
     2. Network analyses in epidemiologic research
     3. It’s gaining popularity and stochastic modeling
     4. “A social network is seen as the relationships among a collection of individuals, with overall structural properties (e.g., the density of relationships among all individuals in the network) and structural properties of individuals located in the network (e.g., if individuals are popular or isolated). These properties can change over time.”
     5. “until the recent development of statistical models to examine coevolving network and behavior processes, four primary limitations restricted the ability to make firm statements about the underlying processes responsible for similarity among friends” (Steglich, Snijders, & Pearson, 2010).
     6. Explain assumptions (Veenstra and snijders have papers on this)
  7. Research Questions
     1. Explain methods to answer them
     2. Data, and variables that will be incorporated
     3. Hypotheses associated with research questions
     4. Proposed analytical methods
        1. Multi-level model approach
           1. Random effects: Semester, night, condition, room
        2. 2 models
           1. Modeling the growth of network connections across the course of the program
           2. Modeling the growth of belongingness across the course of the program
           3. Compare models, explain similarities and differences.
           4. Limitations and strength of each model.
* Keeping this as the primary goal of thesis
  + “Give suggestions to from a policy asking questions about things that are associated with the sn”
* If they don’t form relationships… do they not show up?

***DSSG: Data science for social good.***

Thesis Proposal:

Belongingness in at-risk adolescents: A social network approach

**Proposed committee:**

1. Mentor: Kim Henry
2. In program: Alyssa
3. Out of program: Bailey Fosdick

**Research Questions:**

1. ~~In what ways can social network methodology be applied to an adolescent population within a mentorship program?~~
2. ~~How do the measures of social network compare to measures that we would expect to be associated with one’s friendship network? How do we establish if this a valid measure.~~
3. ~~What methods can be used to validate social network analysis as a proper methodology for measuring friendships in an adolescent population?~~
4. ~~How define embeddedness in network? Specifically, within an adolescent mentorship program. What aspects of a relationship are the most important? What network behavior dynamics contribute the most to adolescent measures of thei relationship with the program?~~
5. ~~Is this approach worth it? It is a long and tedious task, however, social epidemiologic studies how found the benefits of incorporating it into population-based health research. (El-sayed et al., 2012).~~
6. ~~What is the overall convergent validity of the social network data with some of our measures?~~
7. ~~Can we take the aspects measurement and incorporate into friendships networks within the program.~~
8. ~~Do other aspects, i.e density, within a night at as whole aspect~~



