Towards Measuring Relational Embeddedness: 2 Factor Analyses of TRENDS Pilot Survey Data

Tim Walker
Joseph Olsen
Julie Hite

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Study 1: Background

The two previous TRENDS pilot surveys validation studies had utilized the BYU teaching faculty as the survey population. Each professor who agreed to participate filled out the survey form regarding one of their work-related relationships.

The data utilized in this study was similarly generated by surveying a sample of the BYU faculty. Each professor who agreed to participate was asked to select a single individual and answer 45 items dealing with their relationship. The participants were asked to choose a person with whom they interact, but who is not a member of their own college.

Among the 45 items in the TRENDS III were several items which had not been piloted as part of the TRENDS I and II pilots. This was due to the poor performance of some of the existing items in the TRENDS II analyses, which included CFA of TRENDS items for the first time.

The data were collected on paper copies of the survey. Undergraduate research assistants (URA’s) contacted the sampled faculty and made arrangements to invite them to participate. The URA’s then arranged for the retrieval of the surveys.

Study 1: Hypotheses

Two essential hypotheses were tested in this study. First, the hypothesized factor structure of the 45 items identified in the TRENDS II piloting were analyzed to determine if they still represented a model for the survey which was statistically significant and returned good model fit statistics.

The second hypothesis was that an iterative process like that outlined above would be significant, well-fitting model could be identified with a reduced number of items.

The second hypothesis was crucial as it represents a vital step in the evolution of the TRENDS from the pilot to a shortened model. In short, while only batting .500 we ventured to three factors, good model fit was obtained for the shortened model. By eliminating these items from models used within the iterative process it was possible to identify a significant, well-fitting model that could be tested in CFA using the M+ program.

Study 1: Results

What is...? Relational Embeddedness. A theoretical construct that attempts to describe reasons why persons maintain certain interpersonal relationships.

The specific theory of interest was formulated by Hite (2001). Simply stated relational embeddedness is a function of the level to which an individual’s relationship involves more or less of three components:

- Dyadic Interaction. The extent and quality of interpersonal interaction.
- Personal Relationships. Amounts of the emotional connections in the relationship.
- Social Capital. The level of mutual and communal reciprocity affecting the relationship.

TRENDS. A survey designed to measure the levels of three theoretical constructs present in relationships. Ultimately the survey is designed to be used in network studies.

Study 2: Background

The data analyzed for this study was generated as part of a larger survey conducted with school head teachers in Uganda. The head teachers were asked to answer questions about relationships with other head teachers who provided them with resources beneficial to the accomplishment of their work. This network of school administrators was defined geographically by district (a Ugandan political division, not equivalent to a US school district). However, the respondents were not limited in choosing the relationships they rated to only their relationships with other head teachers in the same district.

As part of this study a number of items which had been included in the TRENDS II piloting were asked regarding each relationship. Many of those items eliminated from the final TRENDS II factor models due to factor loadings which did not correspond to the theoretical-based latent constructs. The first step in this analysis was to conduct exploratory factor analyses of these items to determine an appropriate factor model which could be tested in CFA using the M+ program.

Study 2: Hypotheses

Having established an empirical factor model, the next step was to test the model in a confirmatory analysis to determine its model fit and factor loading characteristics.

Study 2: Results & Discussion

Factor Analysis Conducted by Tim Walker, PhD student in Educational Inquiry, Measurement & Evaluation

Study 1: Results

What is...? Factor Analysis. A statistical method which uses analyses of the ways in which survey or test items tend to be answered in the same ways to empirically estimate the degree to which items are related to one another and to latent constructs.

TRENDS. A survey designed to measure the levels of three theoretical constructs present in relationships. Ultimately the survey is designed to be used in network studies.

Future Studies

1. The sixteen item survey should be utilized in a network setting. This would enable analysis of the appropriateness of these specific items and factors in this type of study setting. Additionally, it might allow work on the following questions:

   A. When respondents answer multiple surveys what are appropriate ways of measuring respondent influence on the subsequent relationship?

   B. When individuals are the subject of multiple surveys what are appropriate ways of measuring subjective influence on the subsequent relationship scores.

   C. At what level of clustering in respondent and subject is statistical control necessary?

2. Step 2a and b were to conduct two additional CFA’s in which the identity of the survey respondent and the identity of the survey’s “target” (subject) was used to cluster the data in order to control for the effects of the same person filling out multiple questionnaires or being the target of multiple filled out questionnaires.

   Specifically, the hypotheses were that:

   - The identified factor structure would be statistically significant and exhibit fair model fit, factor loading and correlation variances.

   - The effect of survey respondent would be significant, leading to improvements in model fit over the 1st model due to the clustering of the survey respondents.

   - The effect of survey subject would not make significant improvement in model fit due to the delineate nature of the survey subjects as illustrated in the above network diagram.

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2. Study 2: Results & Discussion

   Values closer to 1.0 are desired for the CFI and TLI measures of model fit. RMSEA ideal values are closer to zero.

   The respondents clustered CFA returns the best model fit statistics. This is in keeping with the hypotheses.

   As TRENDS moves towards use in the intended network settings clustered CFA analyses will be crucial.

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