Telepresence, Technology, and Cybersupervision

Chris Comiskey

October 21, 2016

Project Information

Project No.: C1617-7
Client: Ph.D
Department: Counseling
Statistical Background: Excel, SAS
*TCE 613 - Qualitative Research Interpretation, Design, and Analysis in Counseling and CE
*TCE 662/3/4 - CE Quantitative Research Methods 1/2/3
Major Professor: Deborah Rubel
Consultant: Chris Comiskey
Approximate Timeline: Defend November '17

1 Background and Objectives

Delivery of college and graduate courses and programs through online mechanisms is rapidly increasing, providing educators with additional methods for teaching and communicating with students. These new delivery approaches have strengths and weaknesses for both the student and the educator. One vital aspect of a student's experience is called social presence, which has to do with the degree to which the distance student still feels connected to his or her instructor. This research examines the relationship between social presence and technological hindrances, in online supervision for students in OSU's Counseling Education program, from the student or supervisee perspective.

2 Participants

In 2011 Counseling Education (CE) researchers at OSU Cascades and OSU Corvallis asked CE students in their programs to take part in a survey. Twenty-nine of the 31 CE students enrolled at that time participated, and 12 of those 29 had experience with online supervision. These 12 students actually took the survey. The study was limited to OSU students to avoid the considerable hurdle of involving institutional review boards (IRB) at multiple institutions.

3 Survey Data

The survey consisted of a 55 item questionnaire designed to measure supervision usefulness, telepresence, and barriers. Each trait was assessed by a section of questions specifically designed by other researchers to measure those traits. Only items assessing telepresence and barriers are to be analyzed in this study. Students completed the pencil and paper survey by answering each item on Likert-type scales. The four assessed aspects of telepresence are "realness," "spatial presence," "involvement," and "total telepresence." The two assessed hindrance types are "interpersonal" and "pure technology." You reduced each student's answers to "high" or "low" for each of these six categories. For example, suppose a category consists of four questions, each on a one to seven scale. If the sum across the four questions answers is 14 or less then you classified the rating for that category as"low;" otherwise, with the sum above 14, you classified the rating as "high."

4 Research Questions

You have the following specific research questions:

1. Is there a relationship between **type of technology hindrance** and **level of telepresence**?
2. Is there a relationship between **type of technology hindrance** and **level of spatial presence**?
3. Is there a relationship between **type of technology hindrance** and **level of involvement**?
4. Is there a relationship between **type of technology hindrance** and **level of experienced realness**?

5 Your Analysis So Far

You applied three statistical tests to eight contingency tables, resulting from the two hindrance measures cross-classified with the four social presence measures: chi-squared test, Mantel-Haenzel Chi-squared test, and Fisher's exact test. Two chi-squared test results showed a relationship between hindrance and experienced realness, each with a p-value of 0.046.

6 Recommendations

Neither the institution (OSU) nor the survey participants (students in CE) were randomly selected, and this severely limits the scope of inference. You really can only draw conclusions about these study participants enrolled in the CE program at OSU at this point in time. In addition, due to the absence of random sampling, it's difficult to justify the use of the chi-squared and Mantel-Haenzel tests. Having a simple random sample is an assumption of both tests, with the goal of inference to a parent population. A randomization test, such as Fisher's exact test, is a viable alternative and it will yield a p-value. A randomness null hypothesis is acceptable even without random sampling [Manly, 2006], and without reference to a parent population. A 'randomness' null hypothesis states that any pattern in the data, or in a test statistic, is the result of chance. Therefore, under the null hypothesis a random reordering of the data provides an equally likely value of the test statistic. In this way we can construct a "randomization distribution," which provides a framework to determine how unlikely the observed test statistic is under the null hypothesis. If the observed test statistic is very unlikely then we can reject the null hypothesis, and conclude the arrangement of the data is unlikely to have occurred by chance. To summarize, you should use the results of the Fisher's exact tests, but not those from the chi-squared test or the Mantel-Haenzel tests.

You do have another option, however. It may be beneficial to analyze the data set in its original Likert scale form, rather than collapsing categories into high/low responses. That is, rather than taking the sum of several item responses and categorizing that as high or low, you could just use the sum as your response variable. This would preserve more information than the high/low reduction does. Then, you can use randomization procedures for measuring association of ordered categorical data, and these may provide you with insights that the high/low reduced data set failed to give. To conceptualize, realize that the two by two tables you used are really just collapsed versions of larger tables that measure exactly where a participant measured in each category—instead of just high/low. However, keep in mind that the scope of inference does not change, only the power to detect an association within **this** dataset. Some examples are the Kendall rank correlation coefficient, the Spearman rank correlation coefficient, and the Jonkheere-Terpstra test. These three nonparametric measures of association can yield a p-value as a randomization test. Chapter seven in Agresti [2010], titled "Non-Model-Based Analysis of Ordinal Association," may help you analyze your data in its original form.

7 Summary

The scope of inference for this research is narrow, but randomization tests can provide useful p-values for measuring trends and associations in your data. Going beyond the collapsed version of the data, analysis on the original scale could yield important, previously hidden trends and associations. There are resources for these methods of analysis and interpretation of data, starting with the references included in this document.

References

Bryan F.J. Manly. Randomization, bootstrap and Monte Carlo methods in biology, volume 70. CRC Press, 2006.

Alan Agresti. Analysis of ordinal categorical data, volume 656. John Wiley & Sons, 2010.