Difference between research question and hypothesis:

* Research question is an interrogative statement.
* Hypothesis is a declarative statement.

Project Team

* Jakob Elkenberry
* Daniel Ferris
* Nickolas Solakis
* Malcolm Townes

Survey populations that are likely to trigger full IRB review:

* Children
* Incarcerated individuals

Developing Research Designs

* Accessible population is the portion of the target population that can be reached using given methods within a given timeframe.
* Sample size determined by power analysis, as a proportion of the population, or the standards of the discipline (e.g., samples at low as n=30 are often acceptable in psychology but in sociology often requires samples no less than n=200).
* Significance level is dependent on sample size.

Survey Instrument Preparation

* Needs assessment 🡪 policy evaluation or program evaluation
* Dr. Matsuo does NOT recommend using Amazon Mechanical Turk.
  + Respondents have become accustomed to the measurement scales typically used in survey questionnaires.
  + Some journals will not publish papers based on survey data collected using Amazon Mechanical Turk.

Class Project

* First assignment excluding survey questionnaire due by next week.
  + Additional group work time will be provided during class on Tuesday.
  + Assignment due Thursday, Sep. 19, 2019 by 5:00 PM
  + Email assignment to Dr. Matsuo.
* Pretest survey questionnaire.
  + Will be done within the class.
* Assignments
  + Dan and Nikolas to do additional.
  + Jakob to take the lead on writing.
  + Malcolm to support Jakob on writing.
    - Articulate the research question.
  + Dan to prepare Google Sheet to track literature.

Surveys

* Nonresponse still tells you something about the respondent and the issue addressed by the question.
* Contact SLU mailroom for services to distribute mail surveys.
  + SLU has a contract with a company for bulk mail of surveys.
  + SLU mailroom can prepare (design) business reply envelope.
* Handling missing cases (i.e., non-responses to survey)
  + Make the case for the representativeness of the sample.
  + Compare demographic characteristics of respondents and non-respondents.
  + Acknowledge the bias in the sample data.
  + Discuss non-response error.
* Handling missing data (i.e., non-responses to specific questions)
  + Impute the mean of the sample for the specific question.
  + Impute a value based upon statistical estimation.
  + Discuss patterns of missing data.
* Question should be written at the comprehension level of an eighth-grade student.

Sample sizes required for publication:

* Sociology typically requires a sample size of at least 100 respondents.
* Psychology typically allows sample sizes as small as 30 respondents.

Construct versus Concept

* Construct is measurable (per Dr. Matsuo)
* Concept is abstract idea (per Dr. Matsuo)
* NOTE: Other definitions are just the opposite
  + Volchok, E. (20015). Concepts and Constructs. Retrieved September 10, 2019 from <http://media.acc.qcc.cuny.edu/faculty/volchok/Measurement_Volchok/Measurement_Volchok3.html>
  + Constructs are notions that abstract ideas one cannot observe or measure.
  + Concepts are notions that one can observe (directly or indirectly) and measure.

Validity

* Measurements reflect the real meaning of the concept.
* Types
  + Face validity is when researchers agree on the meaning captured by a measurement.
  + Content validity is when range and degree of meaning is capture in the measurement.
  + Criterion validity (also called predictive validity) is when the measurement predicts performance or behavior of the concept being measured.
  + Construct validity is when the relationships among the constructs in a theory are reflected in the relationships among the variables used to operationalize the concept.
* Triangulation
  + Convergent validity is when different measurement instruments of the same concept produce similar results.
  + Discriminant validity is when different instruments meant to measure different concepts produce different results (i.e., don’t converge on the same thing).

Assignment 01

* Due to Dr. Hisako Matsuo between Friday, September 20, 2019 by 9:00 AM to Monday, September 23, 2019 by 9:00 AM
* Not necessary to include survey questionnaire.

Class Project

* Will need letter of support from manager of Facebook group indicating that it will distribute the survey request to the members to include with protocol submission for Institutional Review Board (IRB) approval.
* Prepare co-authorship agreement and submit with the second assignment.
* Materials to include in IRB protocol application
  + Questionnaire
  + Recruitment materials
    - Recruitment letter
    - Content of email recruitment message
* IRB protocol application process for class project:
  + Prepare the IRB protocol exempt application in the Word document.
    - Complete by October 1, 2019
  + The class will peer-review each other’s IRB protocol.
  + Review suggestions from peers, modify proposal accordingly in Word, and submit Word document to Dr. Matsuo.
  + Review suggestions received from Dr. Matsuo and modify IRB protocol.
  + Prepare IRB protocol in eIRB and submit for peer review by Dr. Matsuo.
  + After Dr. Matsuo approves, then submit the IRB protocol.
    - Complete by October 15, 2019
* Grade for second assignment will be “A” once the project receives IRB approval.

Reliability

* Reliability exists when each item associated with the same concept in a scale or index yields similar results.
* Internal consistency is when all the items under the same concept in a scale or index are highly correlated with each other.
* Reliability greater 0.65 is consider high; a value of at least 0.60 may be acceptable.
* Approaches to reliability:
  + Generalizability Theory
    - To what extent can the results be generalized across different facets (e.g., dimensions, groups) over time.
    - To what extent the results can be replicated.
  + Classical Measurement Theory
    - Test-retest protocol
      * Administer the test to the same sample at two different points in time.
      * Pearson correlation r>0.7 is considered an indication of reproducibility.
    - Alternate form protocol
      * Ask two different questions that measure the same concept.
      * Correlation r>0.7 is considered an indication of reproducibility.
    - Split-half protocol
      * Divide the instrument in half randomly and obtain correlations of each group.
      * Cronbach’s Alpha > 0.65 is considered an indication of reproducibility.
        + Cronbach’s Alpha > 0.80 for psychological measurements
  + Item Response Theory (IRT)
    - Goal is to establish scale that is independent of mode of administration and respondent characteristics.
    - Perform content validity test (see template provided by Dr. Matsuo).
      * The general rule of thumb is a minimum of three (3) experts for content validity test.
    - Options for measuring content validity:
      * Calculate proportion of agreement
        + A value > 0.80 is considered an indication of content validity.
      * Perform cluster analysis for items
      * Calculate content validity ratio (CVR)
        + range is -1.0 > CVR 1.0; higher is better
        + is the number of panelist that rate an item as essential
        + is the total number of panelists

Qualitative Mixed-Methods Designs

* Sequential Exploratory Design
  + Interview Subjects 🡪 Explore Concepts 🡪 Administer Survey 🡪 Examine Results
* Sequential Explanatory Design
  + Administer Survey 🡪 Examine Results 🡪 Interview Subjects 🡪 Explain Results

Class Project

* Preparing IRB protocol
  + For peer review Jacob’s group send to Nathan’s group
  + Send protocol for peer review by Friday, October 4, 2019 by 5:00 PM CDT
  + Send protocol to Dr. Matsuo by Thursday, October 10, 2019 by 5:00 PM CDT
  + Upload and send to Dr. Matsuo by Friday, October 11, 2019 by 5:00 PM CDT

Distributions

* Sample distribution is a listing of all values in the sample and their corresponding probabilities.
* Sampling distribution is a listing of all sample means and their corresponding probabilities.
* Standard error (SE) is the standard deviation of the sampling distribution.
  + SE = ≈ , where is the population std deviation and is the sample std deviation
* Type I error is reject H0 when H0 is true.
* Statistical power is the power to reject H0 when H0 is false.
* Effect size is the strength of the results or findings.

Determining Sample Size

* Estimate with error of estimation no greater than B
  + - where B is error of estimation of the population mean using the sample mean
    - Z is the z-score for the desired confidence interval
    - is the significance level
* Estimate based on population proportion
  + - Z is the z-score for the desired confidence interval
    - is the population proportion
    - is the
    - D is the desired margin of error

Significance Level

* t-value of 2 is about 95% 🡪 0.05 confidence level

Class Project

* Edit survey questionnaire (D. Ferris)
  + Mike Vaughn (School of Social Work)
  + Someone from Washington University in St. Louis (D. Ferris to handle)
* Ask two faculty members to review the survey questionnaire.
* Review and edit draft recruitment message in eIRB protocol (M. Townes and D. Ferris)
* Prepare Facebook posting (N. Sokolis)

Lecture Notes

None.

Class Project

* IRB requires scientific review for non-exempt protocols.
  + Each department has its own scientific reviewer.

Lecture Notes

Cross-cultural issues

* Cross-cultural is the comparison of interactions among people from one culture to the interactions among people from another culture.
* Intercultural is the study of interactions among two or more culturally different groups.

Mix-mode analysis considerations

* Measurement invariance is the difference in the validity of scales when administered to different groups.
  + Can the results of the scale measurement be interpreted the same way for each group?
  + Confirmatory factor analysis (CFA)
    - Number of factors
    - Factor loading
    - Intercepts
    - Residuals
* Both quantitative and qualitative studies can use deductive and inductive methods.
  + Deductive 🡪 theory to specific observations
  + Inductive 🡪 specific observations to theory

General Comments

* No class on October 22, 2019 (Fall Break)

Lecture Notes

* No notes.

General Comments

* Assignment 03 due week of class on Tuesday, November 19, 2019

Lecture Notes

* Pearson correlation analysis requires continuous variables.
  + Measures the degree of association between two variables.
* Chi-square test compares two groups.
  + Application of test
    - Association between two variables
    - Sample statistic with the population parameter
  + Analysis of test results
    - Null hypothesis is that there is an association (e.g., the sample statistic is the same as the population parameter).
    - Significance indicates reject null hypothesis (e.g., sample statistic is NOT the same as the population parameter).
* Regression analysis
  + Standardized coefficient is the same as Pearson correlation in simple linear regression.
    - Indicates which independent variable has the greatest influence on the dependent variable.
  + Can only use continuous and dichotomous categorical variables.

General Comments

* Assignment 03 due Friday, November 22, 2019 by 5:00 PM CST
* Presentations will be on the last class day.

Lecture Notes

* Lecture about policy and program evaluation.
* Group discussed the class project.