

Sampling (and final words about Survey Instrument Development)

Note: next week please bring a copy of the two assigned articles (including study guide for Zanis article).

I. Review—Validity and Reliability

A. **Validity:** A researcher is developing a set of questions to parents about the seriousness of their children’s behavioral problems. What would the researcher do to establish:

1. Face validity?
2. Content validity?
3. Criterion-related validity?
4. Construct validity?

B. **Reliability:** A researcher is developing a set of questions to parents about the seriousness of their children’s behavioral problems. What would the researcher do to establish:

1. Interrater reliability?
2. Test-retest reliability?
3. Internal consistency reliability?

C. Other concepts for test

II. Survey instrument development—the Youth Quality of Life Instrument

***Student reports:

1. Describe the difference between open-ended and closed-ended questions. Give examples of each.
2. In the article “The cultural adaptation of the Youth Quality of Life Instrument” the authors use the term “cultural equivalence.” Define it, and describe a few of the components.
3. In the same article, researchers recommended changes not only to the Spanish version of the instrument, but also the English version. Why?

A. Domains (dimensions) of the YQOL instrument

1. Sense of Self
2. Social Relationship
3. Environment
4. General Quality of Life

***For question #16 “I keep trying, even if at first I do not succeed”, which dimension does that refer to? How about #32 “I feel my family cares about me”?

B. Validity and reliability activities in the Spanish instrument development—“cultural equivalence” *Note: the English version had already been tested for internal consistency reliability (alpha coefficient exceeded .80) and construct validity with another quality of life scale*

1. Semantic equivalence—*meaning* of the original English item is the same as the Spanish translation (see Table 1) [*p. 82 e.g. “decent life” changed to “live well”*]
2. Content equivalence—the content of the instrument is *relevant* to each cultural group under study (dimensions as well as items) [*e.g. addition of “acculturative stress” as a relevant dimension of quality of life*]
3. Technical equivalence—related to response format of the instrument—measurement techniques (Likert scale) are similar in translation [*Changes to instrument visual presentation of 10 point anchors and instructions—see p. 84*]

C. Some tips for writing good questions

1. Note consistency of Likert scale in both sections of YQOL—makes it easier for respondent (addresses reliability). The direction of the choices is the same throughout.
2. Note that the labels of the attributes (e.g. Never, Almost never, etc.) matches question “...*how often*...”

***What’s wrong with this question’s scale?

How often are you depressed?

1)Never 2)Almost never 3)Sometimes 4)Fairly often 4)Very much

3. Note level of difficulty in questions—geared towards adolescent respondents
4. Instructions are well-written and brief. Note: instructions will vary for

instruments designed for self response vs. interview. If you're writing questions to be administered in an interview, write instructions as if others will be doing the interview, e.g. ("If answer is 'Yes' ask respondent for examples...")

5. The instrument is easy to read—no crowding, large print
6. No extraneous questions—all of them there for a reason.
7. More sensitive questions (sexuality, relationship to parents) come later in the instrument, not in the beginning (good rule of thumb for interviews in general)

III. Sampling theory and methods

"The tendency of the casual mind is to pick out or stumble upon a sample which supports or defies its prejudices, and then to make it the representative of a whole class."

Walter Lippman (1889-1974), journalist

A. What is "sampling"? The selection of some units (or observations, or participants) to represent part of, or the entire population of interest

***Student report

What is the difference between the concepts *sample* and *population*? What do we mean by *generalizing to the population*?

B. What is "sampling theory"? The logic of methods to measure whether sample and a population are similar in all relevant characteristics.

C. Why sampling?

1. History of sampling theory—"the scientific assembly line"
2. Population and representativeness
 - a) Representativeness—the extent to which a sample has the same characteristics (of interest in your study) as the population from which it was drawn
 - b) Generalizeability—the relevance of research findings to a population from which the research sample was drawn
 - c) What do you want from your research—depth of understanding or breadth (generalizability)? Sampling procedures should be implied by research questions.
 - (1) What is the relationship between poverty and child abuse for Latinos in urban areas? (Implies breadth or generalizability)
 - (2) What is the perception of Children's Protective Services by leaders of one neighborhood's Latino community? (Implies depth)

- (3) What is the effect of case management on those who abuse methamphetamines? (Implies generalizability)

***Student report

What is the main difference between probability sampling and non-probability sampling procedures?

D. Probability sampling—a sample is representative of its population if all members of that population have an equal chance (probability) of being selected for the sample

1. Logic of probability sampling

a) Our goal in quantitative research is to estimate *population parameters* from *sample statistics*, e.g. how close is the average age of a sample (sample statistic) to the average age of the population under study (population parameter)?

- *Statistic*: a summary description of a variable in a sample
- *Parameter*: a summary description of a variable in population

b) In most cases, we don't know the population parameters; they have to be estimated from the sample (e.g. What is the average depression scale score in the population?)

c) We want to minimize *sampling error* which is the amount of variation in samples leading us to think that any one of the samples doesn't match the true population parameter

d) Probability theory—the logic of estimating the parameters of a population from sample statistics

2. Important Definitions:

a) Universal Population

b) Study population—that part of the universal population that is the focus of your study—stated in the research question and/or hypothesis

c) Sampling frame—could be your entire study population, or more typically it's a *subset of the study population* meeting criteria for inclusion in your study

Often, literally, a *list*

d) Sample (Those ultimately selected to be in your study)

3. Decision process in sampling:
 - a) Define population of interest in the study
 - b) Obtain the sampling frame (list of sampling units)
 - c) Selected study (or sampling) elements by random selection procedure

4. Types of random sampling procedures
 - a) Simple random sampling—uses random numbers (generated by computer) to select participants
 - Or, more simply, pulling names out of a hat
 - b) Systematic random sampling—choose every k th element of a sampling frame or potential pool of participants
 - Choosing every 5th student in a classroom to participate
 - c) Stratified random sampling—Simple or systematic random sampling *with sub-groups*
 - Randomly sampling from a list of clinic clients and obtaining subgroups representing each ethnicity of the client population
 - (1) Proportionate stratified samples—exactly match the population
 - (2) Dis-proportionate stratified samples—oversampling of sub-groups either due to rare events or to increase representation of sub-group for statistical power

5. Multi-stage cluster sampling—sampling from two or more levels of elements or clusters (e.g. cities, neighborhood, blocks, households). Proportionate to Size Sampling—each element within each cluster is given an equal chance of selection, controlling for size of the cluster
 - Think of the Census household surveys—how do they choose households?

E. Non-probability sampling

1. Quota—sample chosen based on predefined characteristics of study so that sample will have same proportion of those characteristics as in the study population
 - In a study of opinions about welfare, sample should reflect gender and ethnicity of population

***What's the difference between quota sampling and stratified random sampling?

2. Snowball sampling—for difficult-to-locate populations: finding more sample

- For a survey of immigrant Vietnamese help seeking attitudes about healthcare, starting with leaders of a community center and asking for referrals of potential participants
3. Purposive (a.k.a. “judgmental”)—selecting sample that is thought to yield the most comprehensive understanding of the study’s topic
 - Specifically approaching Latino adolescent males for their attitudes about school dropout
 4. Convenience (a.k.a. “availability sampling”)—selects participants simply based on their immediate availability. (Note—participants may also coincidentally comprise a purposive sample, but not necessarily)
 - Seeking classmates’ opinions about social work values and motivation for becoming a social worker

***Student report

If you were to pick a type of sampling procedure for your project, which would it be?

F. What size should your sample size be? Considerations:

1. Quantitative (descriptive & explanatory/evaluative topics):

d) Representativeness—how large a sample will represent your population and its sub-groups, if any?

e) Statistical power (the ability of a statistical procedure to detect an effect with high confidence, if in fact the effect is present). For example, the intervention you are studying may have an impact, but if the sample is too small the impact might not be measurable at that time.

f) Feasibility and cost (not too much of a concern, until the 298 project!)

g) Rule of thumb: for simple statistical comparisons (e.g. comparing percentages between two groups) the minimum sample size is 30 per attribute for the variable with *the most attributes*. Example: Controlling for ethnicity, what is the relationship between poverty and child abuse? Let’s say “poverty” will be analyzed with four income categories as a categorical (ordinal) variable, and “Child abuse” is measured as “did abuse occur?” a nominal variable. Ethnicity (nominal) is measured with five attributes. The total minimum sample size would 150 (30 per each ethnicity attribute). And preferably more in the event of non-response, missing data, or unplanned disproportionate sampling.

h) For formal grant proposals, statistical power analysis is required.
(Note—not covered in this course)

2. Qualitative topics

a) Emphasis is on depth rather than breadth, so small samples are typical.

b) It's more important who is selected rather than how many are selected

c) In studies where the sample size is not predetermined, when do you stop selecting participants? Here sample size is dictated by *saturation*, or the point at which no new information can be obtained from further observations or data

IV. Recruitment and Retention Procedures—Vulnerable Populations, and Ethnic Minority Populations

A. Community input into research design and ongoing advisory function (including community leader permission)

B. Culturally and linguistically appropriate recruitment materials

C. Use of community representatives to assist in recruitment, as appropriate

D. Flexible time and place of interviews or surveys

1. Accommodations for after work hours
2. Accessible site
3. Day care & transportation considerations
4. Culturally appropriate food

E. Age- and culturally appropriate procedures to maintain participation (e.g. see Villarruel, et al. article about recruiting Latino adolescents)

V. “Things That Should Be In Your Papers”: Method Section—(Proposed) Sampling Procedures

A. Briefly describe population of your study

B. State and describe your proposed sampling strategy (state specific non-probability or probability procedures) and rationale

C. Describe sampling frame (if applicable), and/or part of population available for study

D. Proposed recruitment procedures

E. Random assignment procedures, if applicable

F. Sample size considerations

G. (*For 298 paper:* descriptive statistics of sample, e.g. average age, percentage ethnicity represented, and other variables of study)

VI. Literature review—student progress reports

VII. Small Group Exercise

Instructions: For your assigned research scenario,

A. Identify the study population implied in the scenario

B. Identify a specific and suitable sampling procedure (name the specific probability or non-probability sampling method)

C. Justify it in this situation. Consider—

1. Do you want to generalize findings to the larger study population?
2. What's more important: breadth vs. depth of information?
3. What information do you gain and lose with this sampling procedure?

D. Briefly describe how that sampling would be implemented:

1. Is there an available sampling frame?
2. How will you select research participants from your sampling frame or otherwise?
3. What special recruitment activities would you have to implement in order to obtain participants?

Scenario 1: You work for an agency that provides support groups for victims of domestic violence in local shelters. One of the objectives of the groups is to help clients feel more in control of their lives. You wonder whether or not the support groups are effective in doing that.

Scenario 2: A children's outpatient mental health clinic is starting a new type of play group that is becoming popular nationally for developmentally delayed children. The clinic's medical records contain information on children's diagnosis. The researcher wants to know how effective the play groups are in increasing children's socialization skills.

Scenario 3: You are interested in why some homeless people use a local service center, while

others do not.

Scenario 4: You are interested in whether having a school social worker on site affects students' performance on standardized testing. You have access to data from schools in many California cities, but can only afford to include 10 of them.

VIII. Important concepts and definitions to learn (consult readings if not covered in class)

- Bias in sampling
- Sampling error (definition—not math)
- Parameter (vs. statistic)
- Probability sampling
- Non-probability sampling
- Quota sampling
- Availability (or convenience) sampling
- Purposive sampling
- Snowball sampling
- Sampling element
- Sampling frame
- Statistic (vs. parameter)
- Nonresponse bias
- Population parameter
- Simple random sampling
- Systematic random sampling
- Stratified random sampling
- Cluster sampling (or multistage cluster sampling)
- Oversampling—disproportionately obtaining higher samples of certain subgroups, relative to their occurrence in the population

***Study Guide for Villaruel et al. “Recruitment and Retention of Latino Adolescents

1. The authors use a research study (the efficacy of an intervention to reduce HIV sexual risk) as an example of recruitment strategies. Can you name the actual research design? (It's not mentioned in this article.)
2. Name a few strategies that helped the researchers recruit Latino adolescents for this study. Did anything surprise you about what the youth suggested?

***Study Guide for Zanis et al. “A community-based trial of vocational problem solving...”
Separate handout.