ISSUES

- <u>Exam results</u> are on the web
- No <u>student handbook</u>, will have discussion questions soon
- Next exam <u>will be easier</u> but want everyone to study hard
- Biggest problem was question on <u>"Research Design"</u>
- <u>Next test</u> in two weeks
- Review the <u>codebook</u> and hand out <u>questionnaires</u>

WHERE HAVE WE BEEN

- Selecting <u>a topic</u>
- Conducting a <u>literature review</u>
- Develop <u>theory</u> and hypotheses
- Draw <u>concepts</u> of importance from the hypotheses
- <u>Identify methodology</u> to test hypotheses
- If select survey research then need to <u>develop questions</u> to measure the concepts
- <u>Indexes and Scales</u> can be used with a questionnaire

What are Indexes and Scales

Indexes and **Scales** both use multiple survey questions to measure a concept in an ordinal fashion (strongly agree, agree, disagree strongly disagree)

- **Index**: all the questions used measure the same variable

- **Scale**: the questions used vary in the intensity of the variable being measured (e.g., prejudice)

- Do we have any concepts in our study that might be measured with an index or scale?

What are Indexes and Scales

Advantage of a single question—survey takes <u>less time</u> to create and administer

Disadvantage of a single question—the respondent might make a mistake when answering or simply be in wrong frame of mind. The <u>one question may not</u> be measuring what the researcher thinks it measures (validity problem)

What are Indexes and Scales

Advantage of multiple questions

- <u>Higher confidence</u> that researcher is measuring a single concept (can compare the multiple questions)

- Can measure <u>differing dimensions</u> of the concept

Disadvantage of multiple questions

- Questionnaire takes <u>more time</u> to create and administer
- Due to the length of the questionnaire, the <u>respondent can get tired</u> and give less attention to the survey questions
- Less room in questionnaire to measure other concepts

Constructing an Index: (1) Selecting Items

- Face (logical) validity
- Unidimensionality
- General or specific
- Variability necessary

(2) Empirical (Statistical) Relationships Between Items (Questions)

- <u>Bivariate and multivariate</u> relationships between the questions

- <u>If two items are empirically related</u>, we can argue that each <u>reflects the same variable</u>, and both can be included in the same index, assuming they are "effects" of the concept being measured (e.g., if the concept to be measured is "job satisfaction" and we ask are you "happy" with your job, "glad to be" in your job, etc.)

- <u>If two items are "results" of the concept</u> being measured we would not necessarily expect them to be statistically related (e.g., if the concept to be measured is "job satisfaction" and we ask about satisfaction with pay, satisfaction with boss, satisfaction with work environment.)

Constructing an Index:
(3) Assign Scores for Responses

Two basic decisions:

- Decide the <u>desirable range</u> of the index scores.

- Decide whether to give each item in the index <u>equal weight or different</u> weights.

- What ranges do we want to use with our indexes?

Constructing an Index: (4) Ways to Handle Missing Data

- Exclude cases with missing data from the construction of the index and the analysis.

- Treat missing data as one of the available responses (e.g., other).

- If they answer four of the six index questions measuring a concept use the average of the four for the two remaining unanswered questions

Constructing an Index: (5) Validate the Index

- **Item Analysis** - internal validation.

- **External validation** – (face validity) ranking of groups on the index should predict the ranking of groups in answering similar or related questions.

Techniques of Scale Construction

1. **Bogardus social distance scale** - measures the willingness of people to participate in social relations (live in same country, community, neighborhood, street, marry). Questions measure varying intensity of social relations.

2. **Thurstone scales** - judges determine the intensity of different indicators.

Techniques of Scale Construction

3.Likert scaling - uses standardized response categories (not really a scale).

4.Semantic differential -asks respondents to rank answers between two extremes or opposites

(happy……………………….sad).

Semantic Differential

	Very Much	Some-what	Neither	Some-what	Very Much	
Enjoyable	☐	☐	☐	☐	☐	Unenjoyable
Simple	☐	☐	☐	☐	☐	Complex
Discordant	☐	☐	☐	☐	☐	Harmonic
Traditional	☐	☐	☐	☐	☐	Modern

etc.

Techniques of Scale Construction

4. **Guttman scaling** - uses an empirical intensity structure (most common).

Steps for creating a Guttman scale

1. Create questions of differing intensity
2. Survey a group of people and examine success of the scale
3. (continued next slide)

Techniques of Scale Construction

Steps for creating a Guttman scale (continued)

3. The more "mixed types" the poorer the scale

4. Percent of correct predictions is called the <u>coefficient of reproducability</u>

5. Fewer items greater chance of success

Index and Scale Scores

Index and Scale Scores

	Response Pattern	Number of Cases	Index Scores	Scale Scores	Total Scale Errors
Scale types	+ + +	677	3	3	0
	+ + −	607	2	2	0
	+ − −	165	1	1	0
	− − −	147	0	0	0
Mixed types	− + −	42	1	2	42
	+ − +	5	2	3	5
	− − +	2	1	0	2
	− + +	4	2	3	4

Total scale errors = 53

$$\text{Coefficient of reproducibility} = 1 - \frac{\text{number of errors}}{\text{number of guesses}}$$

$$= 1 - \frac{53}{1649 \times 3} = 1 - \frac{53}{4947}$$

$$= .989 = 98.9\%$$

This table presents one common method for scoring mixed types, but you should be advised that other methods are also used.

Typologies

- Create a <u>set of categories</u>.

- Nominal rather than an ordinal variable.