SW 430: Research Methods in Social Work I
Study Questions – 12
DUE: 11/13/07

§ Your name and the course number must appear on each page.
§ All pages must be stapled together.
§ Do not use the question sheet for your answers.
§ Your answers must be typed and single-spaced on an answer sheet.
§ You must separate answers for each question with a double space.
§ Your answers must be brief and responsive to the question.
§ Answers should be in your own words (accurate paraphrases). Do not use quotations.
§ Where the question calls for a list, each item on the list must be on its own line.
§ You must type tables on your answer sheet.
§ You must hand draw charts on an 8.5 x 11 inch sheet of graph paper.
§ Neatly display computations on an 8.5 x 11 inch sheet of ruled paper.

Text: Stocks

1. Table 1 shows observed outcome frequencies \( f_0 \) and expected outcome frequencies \( f_E \) for three levels of intervention:
   • communication skills training,
   • empathy training, and
   • insight therapy.

The outcome categories referred to the tactics used to resolve disagreement: (1) coercive argument, (2) avoidance (no discussion), and (3) negotiation.

<table>
<thead>
<tr>
<th>Intervention Status (X)</th>
<th>Observed Coercive Argument (k=1)</th>
<th>Avoidance (k=2)</th>
<th>Negotiation (k=3)</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Training (j=1)</td>
<td>( f_0=8 )</td>
<td>( f_0=7 )</td>
<td>( f_0=20 )</td>
<td>( n_1=35 )</td>
</tr>
<tr>
<td>Empathy Training (j=2)</td>
<td>( f_0=8 )</td>
<td>( f_0=14 )</td>
<td>( f_0=13 )</td>
<td>( n_2=35 )</td>
</tr>
<tr>
<td>Insight Therapy (j=3)</td>
<td>( f_0=18 )</td>
<td>( f_0=7 )</td>
<td>( f_0=10 )</td>
<td>( n_3=35 )</td>
</tr>
<tr>
<td>Outcome Subtotal</td>
<td>( n_1=34 )</td>
<td>( n_2=28 )</td>
<td>( n_3=43 )</td>
<td>( n_\cdot=105 )</td>
</tr>
</tbody>
</table>

For this data set, \( \chi^2_{\text{Obs}} \approx 13.0567 \ldots \)

1.01. What are the degrees of freedom for this test? \( \text{df} = \) ________.

1.02. Find \( \chi^2_{\text{Crit}} \) to three decimal places for the appropriate degrees of freedom at \( \alpha = .05 \). \( \chi^2_{\text{Crit}} = \) ________.

1.03. At \( \alpha = .05 \), should you reject the Null Hypothesis? Why or why not?

1.04. Should we conduct post hoc tests among all pairs of interventions? Why or why not?
2. We compared three programs used to help clients who have difficulty with anger and aggression in interpersonal situations:
   • empathy development training,
   • insight therapy, and
   • catharsis therapy.

Following completion of his or her program, we measured each client’s amount of acceptance of anger and aggression as ways to resolve interpersonal problems with a well-validated instrument. Higher scores on the instrument indicated more acceptance of anger and aggression as an appropriate tactic for dealing with interpersonal situations. Table 2.a presents means and standard deviations of the post-test scores for this analysis of

\[ j = 3 \] groups of \[ n = 20 \] clients each.

<table>
<thead>
<tr>
<th>Levels (j)</th>
<th>Empathy</th>
<th>Insight</th>
<th>Catharsis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>33.00</td>
<td>38.00</td>
<td>47.00</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>17.27</td>
<td>17.39</td>
<td>19.23</td>
</tr>
<tr>
<td>n</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 2.b shows the analysis of variance summary table for these same data.

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>( F_{\text{obt}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Between</td>
<td>2013.3</td>
<td>2</td>
<td>1006.6</td>
<td>3.1127...</td>
</tr>
<tr>
<td>S(A): Within</td>
<td>1843.4</td>
<td>57</td>
<td>323.403...</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20447.3</td>
<td>59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.01. Calculate \( \eta^2 \) for these data. Please round your final answer to two decimal places.

\[ \eta^2 = \ldots \]

2.02. What are the numerator degrees of freedom for \( F \)?

\[ \text{df}_{\text{num}} = \ldots \]

2.03. What are the denominator degrees of freedom for \( F \)?

\[ \text{df}_{\text{den}} = \ldots \]

2.04. Find \( F_{\text{crit}} \) for the appropriate degrees of freedom at \( \alpha = .05 \).

\[ F_{\text{crit}} = \ldots \]

2.05. At \( \alpha = .05 \), should you reject the Null Hypothesis? Why or why not?

2.06. Should we conduct post hoc tests among all pairs of means? Why or why not?

3. We are conducting a study on the relative effectiveness of three techniques designed to help unemployed workers find new employment. The employment skills programs were a job-finding skills workbook, a videotape version of the job-finding skills workbook, and individual counseling. The training package used for the two job-finding skills programs consists of five weekly modules. Individuals receiving counseling saw a worker for 50 minutes, once a week for five weeks.

We randomly selected \( n = 60 \) clients from those desiring help with finding a job in three adjacent counties (Chumley, Oklawaha, Rose). We randomly assigned each client to one of the three techniques with the restriction that equal numbers receive each procedure.

After three months, we evaluated each client’s employment status according to three categories:

• Employed: Those having a full-time job;
• “Seeking”: Those still seeking a full-time job; and
• “Discouraged”: Those who were no longer trying to find employment.

We compared outcome status for each training technique.
3.01 The independent variable in this study refers to which of the following.
- (1) 1st module, (2) 2nd module, (3) 3rd module, (4) 4th module, (5) 5th module
- (1) Chumley, (2) Oklawaha, (3) Rose
- (1) employed, (2) seeking, (3) discouraged
- employment skills program
- employment status
- (1) job-finding skills workbook, (2) job-finding skills videotape, (3) counseling
- counties
- training modules

3.02 Levels of the independent variable in this study refer to which of the following.
- (1) 1st module, (2) 2nd module, (3) 3rd module, (4) 4th module, (5) 5th module
- (1) Chumley, (2) Oklawaha, (3) Rose
- (1) employed, (2) seeking, (3) discouraged
- employment skills program
- employment status
- (1) job-finding skills workbook, (2) job-finding skills videotape, (3) counseling
- counties
- training modules

3.03 The dependent variable in this study refers to which of the following.
- (1) 1st module, (2) 2nd module, (3) 3rd module, (4) 4th module, (5) 5th module
- (1) Chumley, (2) Oklawaha, (3) Rose
- (1) employed, (2) seeking, (3) discouraged
- employment skills program
- employment status
- (1) job-finding skills workbook, (2) job-finding skills videotape, (3) counseling
- counties
- training modules

3.04 The dependent measure in this study refers to which of the following.
- (1) 1st module, (2) 2nd module, (3) 3rd module, (4) 4th module, (5) 5th module
- (1) Chumley, (2) Oklawaha, (3) Rose
- (1) employed, (2) seeking, (3) discouraged
- employment skills program
- employment status
- (1) job-finding skills workbook, (2) job-finding skills videotape, (3) counseling
- counties
- training modules

3.05 Identify the level of measurement (Nominal, Ordinal, Interval, or Ratio) for the dependent measure in this study.

3.06 What type of research design did this study use?
- single sample comparison
  [Uses a single sample. Evaluates difference between sample dependent measure values and known or theoretical population dependent measure values.]
- dependent samples comparison: pre-post
  [Uses a single sample. Evaluates change between pre-test and post-test dependent measure values for sampling units.]
- dependent samples comparison: matched-pairs
  [Uses two samples of matched sampling units (pairs). Evaluates difference between dependent measure values for the matched pairs of sampling units.]
- \( j = 2 \) independent samples comparison:
  [Uses samples formed by assigning sampling units to two different levels of the independent variable or uses samples selected from two different populations. Evaluates difference between dependent measure values for the two samples.]
- two variable correlation:
  [Uses a single sample. Evaluates correlation between ordered pairs of dependent measure values \((X,Y)\).]
- \( j > 2 \) independent samples comparison:
  [Uses samples formed by assigning sampling units to each of the \( j > 2 \) levels of the independent variable or uses samples selected from each of the \( j > 2 \) populations. Evaluates differences among dependent measure values for all samples.]
3.07 Which (if any) of the following screening tests should we use to determine if there is a statistically significant effect or difference?

- chi-square test for the phi correlation
- 2xk chi-square test of independence
- dependent samples Student t test
- exact probability test or large sample Student t test
- goodness-of-fit chi-square test
- independent samples Student t test
- jxk chi-square test of independence (j>2)
- Kruskal-Wallis test
- McNemar change test
- One-way analysis of variance
- single sample Kolmogorov-Smirnov test
- single sample Student t test
- Student t test for the Pearson correlation
- Wilcoxon/Mann-Whitney U test
- Wilcoxon T (matched pair, signed ranks) test
- none of these tests are appropriate.

3.08 Please explain your conclusion. Describe how this study meets or does not meet each of the two most important assumptions for statistical hypothesis testing. If you chose a specific test, describe how the study meets the additional assumptions for the specific test chosen. Your discussion of the assumptions must support your conclusion about which, if any, test is appropriate. Your entire answer should be less than 200 words.