SW 430: Research Methods in Social Work I  
Study Questions – 10  
DUE: 10/30/07

§ 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.  

1. Table 1 shows observed outcome frequencies \( f_O \) and expected outcome frequencies \( f_E \) for two levels of intervention (negotiation 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>Coercive Argument (k=1)</th>
<th>Avoidance (k=2)</th>
<th>Negotiation (k=3)</th>
<th>Intervention Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiation Training (j=1)</td>
<td>( f_O=20 )</td>
<td>( f_O=11 )</td>
<td>( f_O=4 )</td>
<td>( n_1=35 )</td>
</tr>
<tr>
<td></td>
<td>( f_E=14.00 )</td>
<td>( f_E=11.66 )</td>
<td>( f_E=9.33 )</td>
<td></td>
</tr>
<tr>
<td>Insight Therapy (j=2)</td>
<td>( f_O=10 )</td>
<td>( f_O=14 )</td>
<td>( f_O=16 )</td>
<td>( n_2=40 )</td>
</tr>
<tr>
<td></td>
<td>( f_E=16.00 )</td>
<td>( f_E=13.33 )</td>
<td>( f_E=10.66 )</td>
<td></td>
</tr>
<tr>
<td>Outcome Subtotal</td>
<td>( n_{1}=30 )</td>
<td>( n_{2}=25 )</td>
<td>( n_{3}=20 )</td>
<td>( n._{=}75 )</td>
</tr>
</tbody>
</table>

Find the value for \( \chi^2_{\text{obt}} \). Reproduce Table 2 on your calculation sheet to show your work.

<table>
<thead>
<tr>
<th>( f_O )</th>
<th>( f_E )</th>
<th>( f_O-f_E )</th>
<th>( (f_O-f_E)^2 )</th>
<th>( (f_O-f_E)^2/f_E )</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>14.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>11.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>16.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>13.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>10.66</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2_{\text{obt}} = \sum \frac{(f_O-f_E)^2}{f_E} = \text{__________}. \] Please show all work and round your final answer to 3 decimal places.
2. Table 3 shows summary information for a comparison of empathy scores for two groups of graduate students. The first group consisted of \( n_1 = 18 \) randomly selected social work students. The second group consisted of \( n_2 = 18 \) randomly selected counseling psychology students.

<table>
<thead>
<tr>
<th>Table 3: Empathy Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Work</td>
</tr>
<tr>
<td>( \bar{Y}_1 = 11 )</td>
</tr>
<tr>
<td>( SS_1 = 260 )</td>
</tr>
<tr>
<td>( n_1 = 18 )</td>
</tr>
<tr>
<td>( df = 34 )</td>
</tr>
</tbody>
</table>

2.01 Please calculate the standard error of the difference between means. \( s_{\bar{Y}_1 - \bar{Y}_2} = \) ____________

Round \( s_{\bar{Y}_1 - \bar{Y}_2} \) to two decimal places for this answer, but do not use the rounded value in further calculations.

2.02 Calculate \( t_{\text{obt}} \). Please show your work and round \( t_{\text{obt}} \) to three decimal places.

\[ t_{\text{obt}} = \] ____________

2.03 What are the degrees of freedom for \( t \)?

\[ df = \] ____________

2.04 Find \( t_{\text{crit}} \) from the table of critical values.

\[ t_{\text{crit}} = t_{(\alpha/2, df)} = \] ____________

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

3. Table 4 shows the results of a comparison of empathy scores for two groups of graduate students. The first group consisted of \( n_1 = 18 \) randomly selected social work students. The second group consisted of \( n_2 = 18 \) randomly selected counseling psychology students.

<table>
<thead>
<tr>
<th>Table 4: Empathy Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Work</td>
</tr>
<tr>
<td>( Y_1 )</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>13</td>
</tr>
</tbody>
</table>

Y.50 = 10 \( n_1 = 18 \) \( W_1 = 377.5 \) \( n_2 = 18 \) \( W_2 = 288.5 \)

3.01 Calculate \( U_{\text{obt}} \). Please show your work and round \( U_{\text{obt}} \) to three decimal places.

\[ U_{\text{obt}} = \] ____________

3.02 Find \( U_{\text{crit}} \) from the table of critical values.

\[ U_{\text{crit}} = \] ____________

3.03 At a non-directional \( \alpha = .05 \), should you reject the Null Hypothesis? Why or why not?
4. You want to compare outcomes between two programs designed to help families experiencing parent-adolescent conflict. One program has parents and adolescents participate as a family in a program designed to help them acquire improved communication and negotiation skills. The other program has parents learn to set appropriate limits for adolescent behavior and how to establish and apply appropriate consequences for adolescent misbehavior.

One dependent measure will be the number of reciprocal coercive exchanges between parents and adolescents occurring in the last week of the program. A reciprocal coercive exchange includes “fights” between parents and adolescents where physical aggression, threats, shouting, cursing, and/or insults occur.

Based upon data from a pilot study, you have reason to believe that the distribution for number of reciprocal coercive exchanges has a normal distribution.

To identify the appropriate test, you must

- identify tests appropriate to the research design used.
- identify tests appropriate to the level at which the dependent (outcome) variable is being measured and, if relevant, to the distribution of dependent measure scores.

4.01. Appropriate Test = ________________________

You want to be able to detect a medium effect size (as defined by Cohen).

Using non-directional $\alpha = .05$ and a power level of $1 - \beta = .80$, how large a sample should you select?

4.02. Total Sample Size = __________

5. You are conducting a study on the relative effectiveness of two training techniques (anxiety reduction classes or anxiety reduction workbook) designed to help students deal with math anxiety. The training package used for each of the techniques consisted of five weekly modules.

You randomly selected the subjects from those individuals who presented at a university clinic for participation in a treatment study on how to cope with math anxiety.

You randomly assigned each subject to one of the two conditions.

Those participating in the first condition (anxiety reduction classes) attended a class that met every Thursday from 5 PM to 7 PM for six weeks. The first session consisted of an orientation to the program, while the second through sixth sessions covered the material presented in a particular module.

Those participating in the second condition (anxiety reduction workbook) met individually with a social worker at the first session for thirty minutes, where they were oriented to the program and received a workbook covering the material in the first module and instructions for the use of the module. At the second through fifth weekly sessions, each subject met individually with a social worker for ten minutes to review progress, receive the next training module, and instructions for the use of the module. At the sixth session, each subject met individually with the social worker for thirty minutes to review progress, and discuss how to maintain gains.

After training was completed, you administered an instrument that measured level of anxiety about mathematics to all subjects. The instrument consisted of a rating of feelings of anxiety about mathematics on the following seven level self-rating scale: 0 = none, 1 = weak anxiety, 2 = mild anxiety, 3 = moderate anxiety, 4 = severe anxiety, 5 = very severe anxiety, 6 = anxiety as bad as it could be. You compared subject self-ratings between the two training techniques.

5.01 The independent variable in this study refers to which of the following.

- (1) anxiety about mathematics, (2) other anxiety
- (1) anxiety reduction class, (2) anxiety reduction workbook
- (1) before intervention, (2) after intervention
- length of time in training
- (1) social worker, (2) student
- training technique
- pre-participation vs. post-participation status
- presenting problem
- seven level anxiety self rating scale
- math anxiety
5.02 Levels of the independent variable in this study refer to which of the following.
- (1) anxiety about mathematics
- (2) other anxiety
- (1) anxiety reduction class
- (2) anxiety reduction workbook
- (1) before intervention, (2) after intervention
- length of time in training
- math anxiety
- pre-participation vs. post-participation status
- presenting problem
- seven level anxiety self rating scale
- (1) social worker, (2) student
- training technique

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- (1) anxiety about mathematics
- (2) other anxiety
- (1) anxiety reduction class
- (2) anxiety reduction workbook
- (1) before intervention, (2) after intervention
- length of time in training
- math anxiety
- pre-participation vs. post-participation status
- presenting problem
- seven level anxiety self rating scale
- (1) social worker, (2) student
- training technique

5.04 The dependent measure in this study refers to which of the following.
- (1) anxiety about mathematics
- (2) other anxiety
- (1) anxiety reduction class
- (2) anxiety reduction workbook
- (1) before intervention, (2) after intervention
- length of time in training
- math anxiety
- pre-participation vs. post-participation status
- presenting problem
- seven level anxiety self rating scale
- (1) social worker, (2) student
- training technique

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

5.06 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.]

5.07 Which, if any, statistical test(s) would be appropriate?
- 2xk chi-square test of independence
- dependent samples Student t test
- goodness-of-fit chi-square test
- independent samples Student t test
- McNemar change test
- single sample Kolmogorov-Smirnov test
- single sample Student t test
- Wilcoxon/Mann-Whitney U test
- Wilcoxon T (matched pair, signed ranks) test
- none of these tests are appropriate.

5.08 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.
6. We wish to evaluate the medication status of elementary school children in Langoustine independent school district diagnosed with Attention Deficit Disorder. The Langoustine district has 23 elementary schools. We want to compare the use of medication in the district with figures for the United States as a whole. We know the national proportion of use for the following medications (or their generic equivalents):

- Ritalin®
- Concerta®
- Adderall®
- other medication
- no medication

We randomly selected 115 Langoustine district first through fifth graders who had been diagnosed with ADD and determined their medication status. We stratified the sample by school and grade so that we randomly selected just one student from each of the five grades within each school (dimensional probability sampling).

6.01 The independent variable in this study refers to which of the following.

- 1st, 2nd, 3rd, 4th, 5th grades
- (1) Attention Deficit Disorder, (2) other diagnosis, (3) no diagnosis
- diagnosis
- elementary school
- grade level
- (1) Langoustine district, (2) United States
- groups (populations) compared
- medication status
- (1) medication, (2) no medication
- (1) Ritalin®, (2) Concerta®, (3) Adderall®, (4) other medication, (5) no medication
- schools compared
- twenty-three schools

6.02 Levels of the independent variable in this study refer to which of the following.

- 1st, 2nd, 3rd, 4th, 5th grades
- (1) Attention Deficit Disorder, (2) other diagnosis, (3) no diagnosis
- diagnosis
- elementary school
- grade level
- (1) Langoustine district, (2) United States
- groups (populations) compared
- medication status
- (1) medication, (2) no medication
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- 1st, 2nd, 3rd, 4th, 5th grades
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- schools compared
- twenty-three schools

6.05 Identify the level of measurement (Nominal, Ordinal, Interval, or Ratio) for the dependent measure in this study.
6.06 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.]

- **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.]

6.07 Which (if any) of the following tests should we use to determine if there is a statistically significant effect or difference?

- 2xk chi-square test of independence
- dependent samples Student t test
- goodness-of-fit chi-square test
- independent samples Student t test
- McNemar change test
- single sample Kolmogorov-Smirnov test
- single sample Student t test
- Wilcoxon/Mann-Whitney U test
- Wilcoxon T (matched pair, signed ranks) test
- none of these tests are appropriate.

6.08 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 entire answer must support your conclusion about which, if any, test is appropriate. Your entire answer should be less than 200 words.