RESD 700 Fall Term 2022

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Final Exam

**RESD 700 Exam**

Due by 11:59 p.m. on Oct. 16, 2022

**Instructions:**

This is an open book, open notes exam. It comprises of 26 questions with a total of 200 points. The points for each question are listed in parenthesis.

***Please note that the multiple-choice questions only require one best answer.***

***Good luck!***

1. (6 points) Number in order from 1 to 6 the steps in the process of research:

\_\_\_2\_\_\_\_\_\_\_\_\_ Reviewing the literature (in a formal, comprehensive manner)

\_\_\_3\_\_\_\_\_\_\_\_\_ Specifying the purpose/goal of research

\_\_\_5\_\_\_\_\_\_\_\_\_ Analyzing and interpreting data

\_\_\_6\_\_\_\_\_\_\_\_\_ Reporting and evaluating research

\_\_\_4\_\_\_\_\_\_\_\_\_ Collecting data

\_\_\_1\_\_\_\_\_\_\_\_\_ Identifying a research problem (which could be broad)

1. Examine the following research scenarios and answer the questions.
   1. (4 points) A recent study found that college freshmen who participated in an occupational engagement intervention wherein they e-mailed professors, learned ways to increase their information about careers, and wrote about their experiences of learning more about careers scored significantly higher on a measure of career decision-making efficacy than students in a control group.

Please identify the independent variable (IV) and dependent variable (DV).

|  |  |
| --- | --- |
| **Independent Variables (IV’s)** | **Dependent Variable (DV)** |
| Professor Rapport  Professor engagement  Student engagement  Passion for Career  Career Paths | Career Decision-making Efficacy |

* 1. (6 points) A physical trainer wants to compare the effects of two types of exercise programs on weight loss. He divides his clients into two groups: one focused on short-interval circuit training and one focused on a cardio warm-up followed by a free-weight workout. Without his knowledge, some of his clients have decided to cut out carbohydrates in their diet with the hope of increasing their weight loss.

Please identify the IV and DV.

|  |  |
| --- | --- |
| **Independent Variables (IV’s)** | **Dependent Variable (DV)** |
| Circuit Training  Free Weight Training  Carbohydrates Intake | Client Weight Loss |

Please identify the moderating variable (MV), if there is one.

No moderating Variable.

1. (4 points) Below is a list of operationally defined variables:

* **Sex:** Male/Female
* **IQ:** Scores on the Wechsler Adult Intelligence Scales (WAIS)
* **Religious affiliation:** Parent’s designation of child as Catholic, Jewish, Protestant, other or none
* **Feedback:** Subject either is given feedback or is not given feedback on his or her performance in a mathematical problem-solving task
* **Counseling outcome:** Client’s satisfaction with counseling as measure by ratings on a Likert scale.
  1. Identify which of the above variable(s) could be an IV in a **true experiment**. Explain your choice.

|  |
| --- |
| **Independent Variables (IV’s)** |
| Sex: This is a variable that can effect the measurement of the dependent variable. An example of this is when measuring strength, height, or weight. |
| IQ:This is a variable that can effect the measurement of the dependent variable. An example of this is measuring the ability to solve a puzzle. |
| Religious Affiliation:  This is a variable that can effect the measurement of the dependent variable. An example of this is when measuring the responses to new legislation. |
| Feedback:  This is a variable that can effect the measurement of the dependent variable. An example of this is when measuring the performance on another test. |
| Counseling Outcome:  This is a variable that can effect the measurement of the dependent variable. An example of this is when measuring the likeliness of recommending counseling. |

* 1. Identify which of the above variable(s) could be a DV in a **true experiment**. Explain your choice.

|  |
| --- |
| **Dependent Variables (DV’s)** |
| Sex:  This is a variable that can be measured. An example of this is when measuring the effect of temperature on the outcome of the sex on a baby. |
| IQ:  This is a variable that can be measured. An example of this is when measuring the effect education can have on IQ. |

1. (3 points) Why is comparison/control group used in an experiment?
   1. Because they differ in important characteristics
   2. To isolate whether the treatment affects the outcome
   3. To identify if the groups statistically differ
   4. To eliminate whether groups have different experiences
2. (3 points) A researcher is interested in the effects of a preschool program on later school performance. Because she is concerned that socio-economic-status (SES) is a potential moderating variable in her study, she picks children to study who are only from low SES homes. The control technique she used in this study was:
   1. Matching
   2. Random assignment
   3. Holding the moderating variable constant
   4. Statistically controlling the extraneous variable
3. (3 points) Which one of the factors below best distinguishes between experimental and correlational research?
4. The measurement of variables
5. The use of an intervention/treatment
6. The use of association statistics
7. The use of random assignment of participants into experimental groups
8. (20 points) Develop a ***theoretical framework*** with a diagram for the following situations and state ***two different hypotheses, one in the null and the other, in the alternate***.
   * 1. If a company sustains its high earnings year after year, its credibility as a successful company would be enhanced and the public will believe it has further prospects for growth. This will help to explain how sustained earnings will increase the stock value of the company. Faith in the managerial competence of the key people in the company will hold the stock value high, even in times of mild recession. Usually, the higher the dividends, the higher the stock value; however, if the higher dividend declared is perceived as a stunt to hoodwink the public, the stock value will not go up. Only when the public expects that the dividend policy will be maintained by management in the future will the stock value of the company be influenced by the higher dividends that are declared.

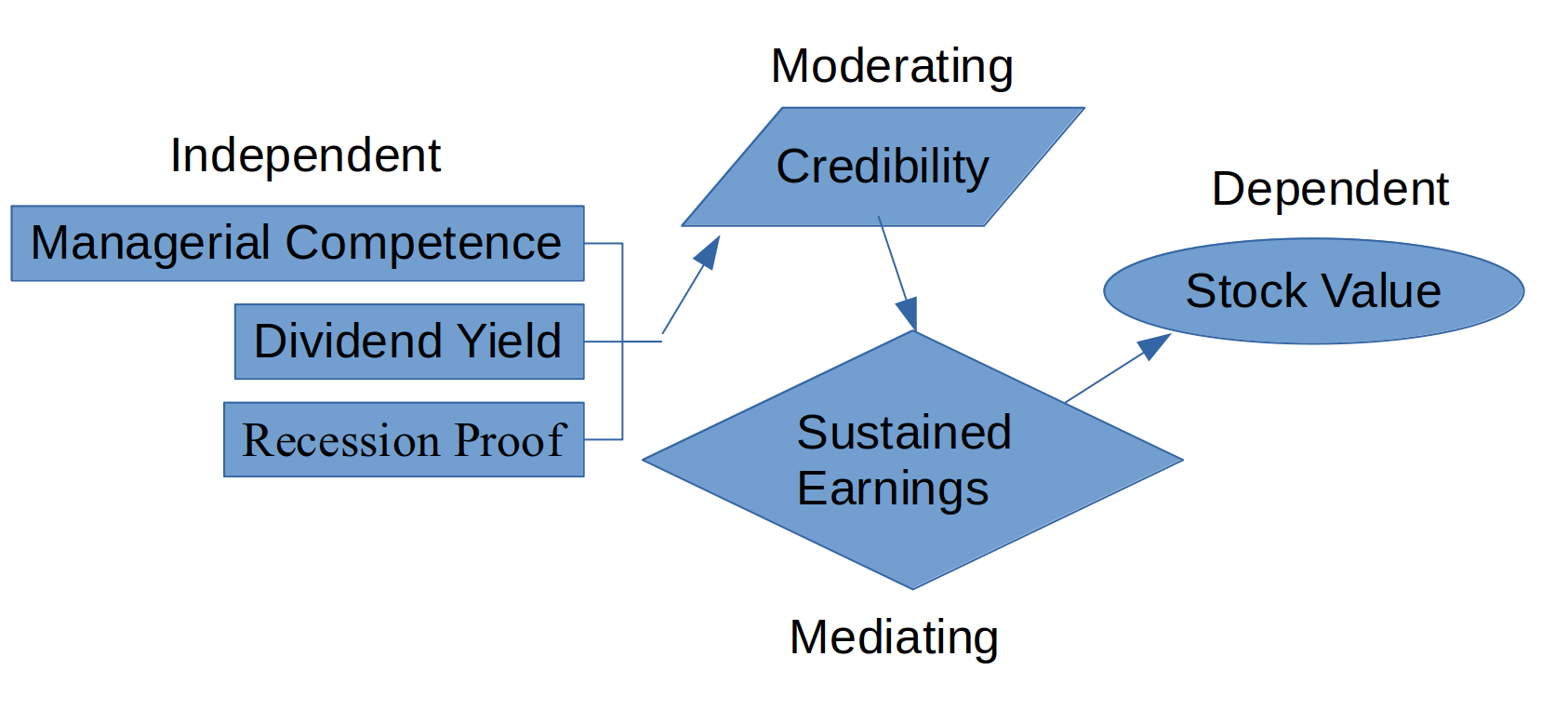
Study Introduction:

This will be a causal study in that earnings cause greater credibility in the public eye increasing stock value. The argument being that the combination of managerial competence, dividend yields, and recession proof policies influence public credibility as moderating variable. The mediating variable is sustained earnings which sits between credibility and the dependent variable of company stock value.

Variables:

|  |  |  |  |
| --- | --- | --- | --- |
| Independent Variables | Moderating Variable | Mediating Variable | Dependent Variable |
| Managerial Competence  Dividend Yield  Recession Proof | Credibility | Sustained Earnings | Company Stock Value |

Conceptual Model:



Hypotheses

Null Hypothesis: Managerial Competence, Dividend Yield, and being Recession Proof does not cause greater Company Stock Value.

Directional Hypothesis: Managerial Competence, Dividend Yield, and being Recession Proof does cause greater Company Stock Value.

* + 1. When a product is of good quality, consumer confidence in the product grows, and the stronger becomes the decision of the consumer to purchase the product. A reasonable price and a good brand name also induces the consumers to purchase the product. Of course, the more the consumer needs the product (such as basic needs or essentials), and the better the price, the quality, and the brand name, the greater the prospect for the consumer making the decision to buy the product. Usually, the better known the brand name, the greater the desire to purchase a product bearing the good brand name. However if a prospective consumer happens to have a strong brand loyalty for another brand than the one marketed, then, the brand name of the product will not influence the purchase decision.

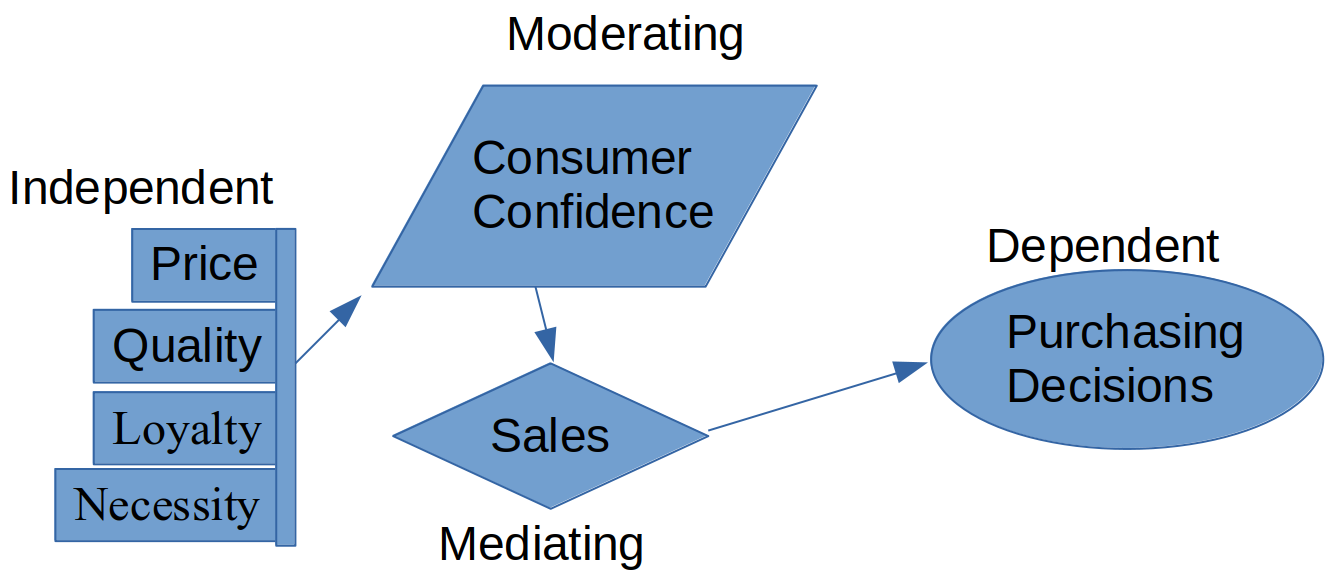
Study Introduction:

This will be a causal study in that good quality causes greater consumer confidence increasing customer purchasing decisions. The argument being that the combination of reasonable prices, quality products, brand loyalty, and necessity for products increases consumer confidence as the moderating variable. The mediating variable is sales which sits between consumer confidence and the dependent variable of customer purchasing decisions.

Variables:

|  |  |  |  |
| --- | --- | --- | --- |
| Independent Variables | Moderating Variable | Mediating Variable | Dependent Variable |
| Price  Quality  Brand Loyalty  Necessity | Consumer confidence | Sales | Purchasing Decisions |

Conceptual Model:



Hypotheses

Null Hypothesis: Price, Quality, Loyalty, and Necessity do not cause greater Purchasing Decisions.

Directional Hypothesis: Price, Quality, Loyalty, and Necessity do cause greater Purchasing Decisions.

1. (20 points) Several situations are given below. For each situation, respond to the following research design questions.

Situation #1: A basic researcher wants to engage in a research project which will enable her to establish the relationship between certain personality characteristics and the risk-taking tendencies of stockbrokers.

1. What would be the purpose of the study that would be designed - exploratory, descriptive, or causal? Give reasons for your answer.

This is an exploratory study because it creates a scope for future research. The research is simply observing personality characteristics and analyzing the risk-taking data. There is no cause and effect relationship being established yet.

1. Would it be a field study, lab experiment, or field experiment?

This would be a field study there is no experiment being done yet and it is not in a simulated lab environment.

1. Would it be a causal study, a correlational study, or other types of study? Justify your answer.

This would first be performed as a correlation study because of the use of multiple characteristics as independent variables. It would then correlate the data on the independent variables and see if any inference can be established.

1. Would it be a longitudinal or cross-sectional study? How would you explain your answer?

This would be a longitudinal study in that it would take multiple brokers over a course of time.

1. What would be the unit of analysis? Defend your answer.

The unit of analysis will be the return on investment (ROI) for every broker.

This study will judge success by ROI per broker based on their individual characteristics.

Situation #2: A researcher wants to test the theory that low levels of oxygen in the mines are the single most important factor that tires the miners easily.

1. What would be the purpose of the study that would be designed - exploratory, descriptive, or causal? Give reasons for your answer.

This is a causal study because the researchers aim to prove that oxygen levels in mines cause tired miners. This establishes a cause and effect relationship.

1. Would it be a field study, lab experiment, or field experiment?

This would be a field experiment because it's in the miner's workspace which is the field, and the experiment is different oxygen levels.

1. Would it be a causal study, a correlational study, or other types of study? Justify your answer.

This would first be performed as a causal study because it establishes the cause and effect relationship of low oxygen levels cause tired miners.

1. Would it be a longitudinal or cross-sectional study? How would you explain your answer?

This could be a cross-sectional study because they could have different oxygen levels in different mines measuring the miner's tiredness all at the same time. On the other hand, you could use the same mine and same group of workers over time measuring different oxygen level results over days, this would make it longitudinal.

1. What would be the unit of analysis? Defend your answer.

The unit of analysis will be survey information taken about miner tiredness at different oxygen levels. This will create discrete data to infer from.

Situation #3: An Auditor is interested in knowing the relationship among the three variables – depreciation, assets accounting, and taxes paid.

1. What would be the purpose of the study that would be designed - exploratory, descriptive, or causal? Give reasons for your answer.

This is a descriptive study because nothing is being manipulated. There is no cause and effect relationship being hypothesized yet.

1. Would it be a field study, lab experiment, or field experiment?

This would be a field study, the auditors would not be performing any experiments but simply observing to gather data.

1. Would it be a causal study, a correlational study, or other types of study? Justify your answer.

This would first be performed as a correlation study because data is gathered, and no hypothesis has been formed yet.

1. Would it be a longitudinal or cross-sectional study? How would you explain your answer?

This would have to be a longitudinal study because it would analyze the data after an amount of time. This being after all the data is collected for the variables.

1. What would be the unit of analysis? Defend your answer.

The unit of analysis will be the dollar value of all three variables. This could give a discrete value to compare all three to each other.

Situation #4: Bob’s Nissan and Toyota dealership is suffering from a severe decline in the number of car sales. Bob decides to test two approaches to sales. He randomly assigns his 12 salesmen to two groups. He then trains one group to use the “hard sell” approach and the other to use the “soft sell” approach so that he can determine which method is more effective.

1. What would be the purpose of the study that would be designed - exploratory, descriptive, or causal? Give reasons for your answer.

This is an exploratory study because the researcher is exploring which sales approaches create better results.

1. Would it be a field study, lab experiment, or field experiment?

This would be a field experiment because it would be in an uncontrolled sales floor environment, but the experiments would be the approach to sales.

1. Would it be a causal study, a correlational study, or other types of study? Justify your answer.

This would first be performed as a causal study because the researcher is trying to establish that one sales approach causes more sales than the other.

1. Would it be a longitudinal or cross-sectional study? How would you explain your answer?

This would have to be a longitudinal study because it would analyze the data after an amount of time. This being after all the sales data is collected.

1. What would be the unit of analysis? Defend your answer.

The unit of analysis will be the dollar value of sales. This can create discrete data to correlate sales approaches to sales.

1. A researcher wants to examine the effects of3 middle school violence prevention programs on rates of student violence. Rates of student violence are measured by documented disciplinary action by school authorities such as detentions and / or expulsions, police reports, as well as student surveys. All 7th graders enrolled in 3 school districts in Illinois are required to take a violence prevention program. Students within each high school in each school district are randomly assigned to one of 3 violence prevention programs. Data are collected both immediately before and 6 months after the interventions are completed. The researcher plans to statistically analyze whether there are significant drops in school violence following the violence prevention programs and whether there are significant differences in the rate of drop between programs.
   1. (4 points) What type of design is used in the research above?

The above design is a correlational research design, they are trying to see a correlation between violence prevention programs and student violence.

* 1. (6 points) Below are 2 types of threats to the internal validity of quantitative research designs. For each threat state whether think it could affect the validity of the design above. Explain your answer for each.
* Diffusion of treatment:

A Diffusion of treatment could be crime prevention programs don't correlate to violence and that the violence acted out would be random in nature or influenced by outside factors.

* Testing:

During this test, the students are asked to take surveys about violence multiple times.

This makes it a testing threat to the internal validity because the students can infer what the study is about and can affect the outcome of the violence prevention programs. Some may choose to be more violent now they know they are being studied or can be less violent.

1. A researcher wanted to examine whether adding a high-quality diagram / illustration helped middle school students understand a short text on photosynthesis. He randomly selected 12 students from a list of all middle school students attending a large urban school district. The researcher randomly assigned 6 of these students to the “text only” condition and the other 6 students to the “text + diagram” condition. Each group was first given a pre-test for prior knowledge about photosynthesis. Then both groups were given their respective texts to read. Participants were told that they would be tested on the content of the text at the end of the session. The “text only” group read a short (1 page) verbal description of the process of photosynthesis. The “text + diagram” group read the same text as the previous group but with a high-quality diagram added to illustrate the process of photosynthesis. Both groups were given 20 minutes to read the text. The researcher then administered both groups the posttest on photosynthesis (the posttest was the same as the pretest). An analysis of pretest scores showed no differences between the groups in terms of prior knowledge. A t-test of posttest scores was then conducted to see if there was a significant difference in performance between the 2 groups. The t-test indicted that there was no significant difference in post test scores between groups at the α = .05 level.
   1. (4 points) What type of quantitative research design was used in the study described above? Explain your answer.

This was a causal research design, it tries to establish that photosynthesis diagrams cause greater understanding of photosynthesis.

* 1. (6 points) Could “maturation” and “testing” be threats to the internal validity of the research design described above? Explain your answer for each in a few sentences.

Maturation could not be a threat because the pretest, experiment, and posttest all happen continuously and there is no time for maturation to occur. Testing Could be a threat to internal validity because having to take two tests could have affected the outcome of the test scores even though this was not the case in this experiment.

1. The *Chicago Tribune* of July 21, 1995 reported on a study by a fourth-grade student named Beth Peres. In the process of collecting evidence in support of her campaign for a higher allowance, she polled her classmates on what they received as an allowance. She was surprised to discover that the 11 girls who responded reported an average allowance of $2.63 per week, while the 7 boys reported an average of $3.18, 21% more than for the girls. At the same time boys had to do fewer chores to earn their allowance than did girls. The story had a considerable national prominence and raised the question of whether the income disparity for adult women relative to adult men may actually have its start very early in life.
   1. (4 points) What are the dependent and independent variables in this study? ***How are they measured***?

|  |  |
| --- | --- |
| Independent Variables | Dependent Variable |
| Sex of classmates  Amount of Chores | Allowance amount |

* 1. (2 points) What kind of sampling method are we dealing with here?

This is a probability sampling because the students in her class are random. She did not select certain kids from certain classes.

* 1. (2 points) How might Beth go about “random sampling?” How would she go about “random assignment?”

To random sample she can choose random students in her class to be part of the experiment. To random assign she could choose a discrete number of boys at random and a discrete number of girls at random.

* 1. (2 points) If random assignment is not possible in this study, does that have negative implications for the validity of the study?

Yes, that would argue the validity of the study because the selected students could have a predefined disposition to base their allowance levels off.

* 1. (2 points) What are some of the variables that might influence the outcome of this study separate from any true population differences between boys’ and girls’ income?

The area in which this study is taken place, different income levels of the greater area would create different results as would different religious beliefs.

* 1. (2 points) Distinguish clearly between the descriptive and inferential statistical features of this example.

The descriptive statistic is that boys allowance is typically more than a girls. The inferential statistic leads to the hypothesis that because students are boys, they will have higher allowances.

1. (4 points) We have sent out everyone in a large introductory course to check whether people use seat belts. Each student has been told to look at 100 cars and count the number of people wearing seat belts. The number found by any given student is considered that student’s score. The mean score for the class is 44, with a standard deviation of 7. Assume that the counts are normally distributed. A student who has done very little work all year has reported finding 62 seat belt users out of 100. Do we have reason to suspect that the student just made up a number rather than actually counting? (Hint: Calculate the standard score, *z*, of this raw score, z = (X – M)/SD = (62 - 44) / 7 = 2.57, and interpret what the *z* score means.)

The Z score being 2.57 standard deviations from the mean gives way to that he probably made up a number. It is very unlikely he chose a number so far right in the standard bell curve distribution. A z-score between -1.65 and 1.65 would be more believable. The chances he didn't make it up is about %5.

1. (3 points) Maricella has collected her thesis data that examines differences in PSAT math achievement in Latino boys and girls. However, upon a second look at the graphs of her raw scores, it appears that the boys’ scores are more normally distributed and the girls’ scores are somewhat more bunched together around the mean. Given this information, what can you conclude regarding the data set?
2. The standard deviation is likely smaller for girls.
3. The girls’ distribution is likely unimodal.
4. The girls’ mean score is more representative of the data.
5. The girls’ median is higher than the boys’ median.
6. (3 points) Which test could best be used to test the hypothesis that the average price that people are willing to pay for a meal at the University restaurant differs between Dutch, German and Chinese students?
   1. Regression analysis.
   2. Independent samples t-test.
   3. Chi-square test.
   4. ANOVA.
7. (3 points) Andy compared students’ ability to transfer learning from ***three*** different types of instructional materials. He found that there were pre-existing group differences between his conditions. Which of the following is the appropriate analysis technique for Andy to use?

a. Nonindependent t test

b. Independent t test

c. MANOVA

d. ANCOVA

1. In her study of student athletes’ achievement motivation, Katie administers a self-report achievement motivation scale before she starts a new motivation enhancement intervention. After the intervention, Katie again assesses students’ achievement motivation. She set her alpha at p=.05, and reports that there were no significant findings in her study.
2. (3 points) Which of the following best represents the design of Katie’s study?
   1. Experimental
   2. Cross-sectional
   3. Correlational
   4. Pre-experimental
3. (3 points) Which statistical analysis was appropriate for Katie to use to determine if there were treatment differences in her study?
   1. Pearson r
   2. ANOVA
   3. Spearman rho
   4. t test
4. (3 points) Katie questions whether there are significant differences in her study but her significance level is unable to detect these differences. What type of error is Katie most concerned that she is committing?
5. Type I
6. Type II
7. Type III
8. Type IV
9. (3 points) Based on the scenario, from the following options, how would you advise Katie regarding her analyses?
10. Change your probability level to *p*=.001.
11. Evaluate and conduct the study with a new sample
12. Reanalyze with a two-tailed analyses.
13. Use a nonparametric significance test
14. (4 points) Miller et al. (1988) wanted to see if Modified Reciprocal Teaching (MRT) would lead students to acquire better reading and writing skills than traditional instruction. They assigned students randomly to 1 of 2 groups, an MRT group, or a control group receiving traditional instruction. They gave a comprehension posttest to each group and compared the means. They reported the following:

"The comprehension scores of the MRT and Control group were significantly different, F (1, 44) = 15.38, p < .001."

Explain what this statement means in terms of statistical hypothesis testing (i.e., decisions with respect to the Null Hypothesis and the Alternate Hypothesis).

Since the F value is way larger than 1, then the variations between the two groups mean values are more than you would see by chance. So, if the null hypothesis was true, it would be closer to 1. Since it is not then the alternate hypothesis is probably true. Because the P value is .001 the null hypothesis has a 1/1000 chance of being true.

1. Foa, Rothbaum, Riggs, and Murdock (1991) conducted a study evaluating four different types of therapy for rape victims. The Stress Inoculation Therapy (SIT) group received instructions on coping with stress. The Prolonged Exposure (PE) group went over the events in their minds repeatedly. The Supportive Counseling (SC) group were taught a general problem-solving technique. Finally, the Waiting List (WL) control group received no therapy. Data with the same characteristics as theirs follow, where the dependent variable was the severity rating of a series of symptoms.

|  |  |  |  |
| --- | --- | --- | --- |
| *Group* | *n* | *Mean* | *S.D.* |
| SIT | 14 | 11.07 | 3.95 |
| PE | 10 | 15.40 | 11.12 |
| SC | 11 | 18.09 | 7.13 |
| WL | 10 | 19.50 | 7.11 |

* 1. (4 points) The analysis of variance (ANOVA) was run, and the results are in the following table. Draw whatever conclusions are warranted. Interpret what the conclusions mean.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Source* | *df* | *SS* | *MS* | *F* |
| Treatment | 3 | 507.840 | 169.280 | 3.04\* |
| Error | 41 | 2279.067 | 55.587 |  |
| Total | 44 | 2786.907 |  |  |
| \* *p* < .05 |  |  |  |  |

From this table we can see Treatment has a degree of freedom of 3 meaning the 3 treatments were performed. Along with the 4 options being Error as the null hypotheses. Because the Treatments Sum of Squares is lower than Errors, this tells us the variation between data set results of Treatment is smaller than the variation from the null hypothesis results. The high mean square value of Treatment compared to Error’s means that the treatments were significant compared to Errors. Since the F value of Treatment is way larger than 1 its gives way to the notion that Treatment does affect the dependent variable, and probably way more than the null option does. Lastly *p* < .05 is the probability that the null hypothesis is true. From this one can judge that the treatment is probably 95% more effective than the null.

* 1. (4 points) The Bonferroni test was run to compare the WL group with each of the other three groups. The results are in the following table. What would you conclude? How does this compare to the answer to part a?

|  |  |  |
| --- | --- | --- |
| WL versus SIT | WL versus PE | WL versus SC |
| *t* = 2.73 | *t* = 1.23 | *t* = 0.433 |

The critical value of the Bonferroni test is 2.50.

From this Bonferroni table we can conclude that the SIT group was the most significant. One could almost get rid of the PE and SC group altogether and the SIT group alone would show significant results.

1. (4 points) Identify the problem in EACH of the following questionnaire items:
2. Which is the most serious social problem in the U.S. today, anomie or oversocialization?

The problem with this question is the response will only tell you which is the serious problem and not why this person feels that way. The question should end with “why do they feel that way?”

1. Do you think there is a good market for the product and that it will sell well?

The problem with this question is that it only returns yes or no type answers. It should begin with a “what” and end with a “why will it sell” instead to get more a detailed answer.

1. Don’t you think that in these days of escalating costs of living, employees should be given good pay raises?

The problem with this question is that it only returns yes or no type answers. It should begin with “why they should be given good pay raises” instead to get a more detailed answer.

1. A set of response categories to the question “What is your current age?” is:
   * 1. 1-5
     2. 5-10
     3. 10-20
     4. 20-30
     5. 30-40

The problem with this is the sampling size changes. The first numeral goes from a sample size of 5 to the rest having a sample size of 10. The should remain even.

1. (6 points) Below are listed the steps in the process of testing a hypothesis in a quantitative study. Place the steps in order from 1 to 6 with 1 as the first step and 6 as the last step.

4\_\_\_\_\_\_\_\_\_ Compute the sample statistic

1\_\_\_\_\_\_\_\_\_ Establish the null hypothesis

3\_\_\_\_\_\_\_\_\_ Collect data

5\_\_\_\_\_\_\_\_\_ Make a decision about rejecting or failing to reject the null

2\_\_\_\_\_\_\_\_\_ Set the level of significance (alpha)

6\_\_\_\_\_\_\_\_\_ Determine the practical significance of the results

1. (10 points) What kinds of sampling designs would be used for EACH of the following research scenario?

a. A study to get a quick idea of the medical acceptability of a new aspirin substitute which cannot be dispensed over the counter without prescription.

A judgment sampling design should be used here because the researcher wants to get a quick idea and they should use their professional judgment to survey where they believe they would get better data. In this case not surveying the small less distinguished medical professionals but the larger more established ones.

b. A study involving a sample of 325 students in a university where 2,000 students are enrolled.

This would be a simple random sampling where 325 students would be randomly selected from the 2000 enrolled.

c. An investigation of the career salience of professionals in the fields of medicine, engineering, business, and law.

This would be a stratified random sampling where the stratification would be by the four fields.

d. The generalizability of the attitudes of blue-collar workers from a sample of 184, to the total population of 350 blue collar workers in the entire factory of a particular company.

This should be systematic sampling because the data can be sampled from over a relatively even distribution of samples. Preventing more prominent peaks and valleys in the graphing.

e. Ms. Smith, a school superintendent, wants to survey the reading achievement of first graders in her large urban school district so that she can decide which sorts of remedial programs her district should support. Her district contains 40 elementary schools with 100 first grade classrooms and it is too expensive to administer a standardized reading achievement test to all first graders. Therefore, 20 first grade classrooms are randomly selected for testing. What kind of sampling has been used here?

This is a cluster random sampling where students will be clustered into 20 individual classrooms randomly.

1. (5 points) Examine the following results reported in a quantitative study:

“The scores varied for band members (M=3.5), choir members (M=3.9), and for student athletes (M=5.4) for attitudes toward engaging in school activities during the 3-5 p.m. period of time. A comparison of the groups, at an alpha of .05, showed a statistically significant difference among the three groups, F (3, 8) = 9.87, *p* = .031, effect size = .91 SD.”

As you examine this statement, you conclude: (place an X in the appropriate column)

|  |  |  |
| --- | --- | --- |
|  | NO | YES |
| The null hypothesis was rejected. |  | X |
| The level of significance showed a probability of rejecting set at 5 out of 100 times. |  | X |
| The statistical test used was a t-test. | X |  |
| The magnitude of differences among the groups was over one standard deviation. | X |  |
| Band members differed significantly from student athletes in their attitudes. |  | X |

1. (12 points) Below is a tabulation of the demographic data from the Frequency distribution of a survey done by Ms. Sandra Jones. Her sample consisted of 148 of a total of 3,700 clerical employees in three service organizations.

Based on the tabulation provided below, describe the sample characteristics.

Table 1: Frequency Distributions of Sample (n = 148)

|  |  |  |
| --- | --- | --- |
| Race | Education | Gender |
| Non-whites = 48 (32%) | High School = 38 (26%) | Males = 111(75%) |
| Whites = 100 (68%) | College Degree = 74 (50%) | Females = 37 (25%) |
|  | Masters Degree = 36 (24%) |  |

From this sampling we can see that Whites are the majority race and that about half the employees have a college degree. Males outnumber females 4:1 in this scenario.

|  |  |  |
| --- | --- | --- |
| Age | # of Years in Org. | Marital Status |
| < 20 = 10(7%) | < 1 year = 5 (3%) | Single 20 (14%) |
| 20-30 = 20(14%) | 1-3 = 25(17%) | Married 108 (73%) |
| 31-40 = 30(20%) | 4-10 = 98(66%) | Divorced 13 (9%) |
| >40 = 88(59%) | >10 = 20(14%) | Alternative Lifestyle 7 (4%) |
|  |  |  |

From this table we can see the majority of employees are about 40 years old, have been with the company 4-10 years, and are married.

Here is another tabulation of the Means, Standard Deviations, etc., for Ms. Jones’ data. How would you interpret these data?

Table 2: Means, Standard Deviations and Other Statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| VARIABLE | MEAN | STD. DEV | MODE | MIN | MAX |
| Age | 37.5 | 18 | 38 | 20 | 64 |
| # of Years Married | 12.1 | 24 | 15 | 0 | 32 |
| Stress | 3.7 | 1.79 | 3 | 1 | 5 |
| Job Involvement | 3.9 | 1.63 | 4 | 2 | 5 |
| Performance | 3.6 | 0.86 | 3 | 3 | 5 |

From the table above we can see that the Age, Married, and Performance are right skewed because their mean values are closer to their Min values than they are to the Max values. The rest are opposite in that their means are closer to the Max values than the Min values, so they are left skewed.

From the same research done by Ms. Jones, the following inter-correlation matrix is shown. Interpret these results.

Table 3: Pearson Correlations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Age | # of yrs. Married | Stress | Job Involvement | Performance |
| Age | 1.0 |  |  |  |  |
| # of yrs. married | .86 | 1.0 |  |  |  |
| Stress | .43 | .61 | 1.0 |  |  |
| Job Involvement | .53 | .32 | .58 | 1.0 |  |
| Performance | .09 | .06 | .49 | .36 | 1.0 |

a. All correlations above .30 are significant, at least at the .05 level.

b. All correlations above .50 are significant, at least at the .01 level.

From this we can see that the greatest relationship to age in the company is years married and slightly less is job involvement. The biggest relationship supporting a long marriage is stress. To prevent stress job involvement is slightly more significant than performance. So, from this table we can see that someone's age in the company is mostly based off years married but can also be related to job involvement and stress to lesser extents.

1. (8 points) Indicate what type of data collection/measurement would be most appropriate for each research question. Use the following KEY. Explain the reasons for each choice in a few sentences.

**KEY:**

1. Interview
2. Quantitative and / or qualitative observation
3. Standardized paper and pencil objective test
4. Survey questionnaire containing items in Likert scale format
5. Performance assessment
   1. To determine the degree of satisfaction that parents of American high school students have with public school education.

For this instance, a survey questionnaire containing items in Likert scale format would be best because it would give a strong indication of the parent's satisfaction from strong to weak feelings about the subject matter.

* 1. To study how the introduction of a computer work station for students into two 3rd grade classrooms at Murdoch elementary school, affects the classroom management styles of the teacher.

For this instance, a qualitative observation would be best because it observes the experiment in place, and shows how the dependent variable reacts. In this case it would be how the teacher is able to manage their classroom.

* 1. To determine the reading and math competence of all fifth graders in the USA for use in a comparative study of educational achievement across industrialized countries.

For this instance, a standardized paper and pencil objective test should be used to create a correlation for the competency of the students in different countries.

* 1. To determine 5th grade students’ misconceptions and prior beliefs about the solar system.

For this instance, an interview collection is best suited because it will get data about the student's solar system beliefs and misconceptions without any outside influence.

1. (5 points) Below is an excerpt from the research of P. Robinson titled “Within the Matrix.”

In my case, I find myself using computers more and feeling a battle between being terrorized as well as enchanted by them. …My research is rooted in a life-long journey that has sought to find meaning in the use of technology.  As I untangle myself from my own technological matrix, I have begun to discover meaning in the connections I thought were only a matter of circumstance. This deeply held search for meaning within a technological matrix has taken form in my research question.  I want to know what it is like for students using computer conferencing for all or part of their course instruction.   Without some sense of how I experience this phenomenon, I enter the research ungrounded.  The influences, the ebbs and tides of my own experience, lay hidden.  It is from my own experience of computers and WCC that I not only begin to explore my own sense of meaning from the experience, but I begin to wonder what it is like for others.

What key feature of qualitative research does the researcher exemplify in the excerpt above?  Explain your answer.

A key feature of this excerpt is the natural environment, this being the students using computer conferencing for part or all of their course instruction is a natural setting. They are using multiple sources of data as input from different students and the researcher is being their key instrument for research by gathering the data.

1. Read the excerpt and answer the questions:

This paper examines parental values among Midwestern middle class families and the role of after- school activities in transmitting these values to the younger generation as parents themselves balance work and family life. … recognizing that among preadolescent children participation in extra-curricular activities generally requires parental involvement – either financial investments or personal involvement through the scheduling of, driving to, attending of, or volunteering at their children’s activities – we examine the choices that middle class families make about how children and families spend time in the light of the broad goals and expectations that parents have for their children. How children’s involvement in after school activities gets played out in the context of other family, work, and community obligations, and how participation in these activities both reflects and reinforces parental ideologies is the focus of this paper.

From “Parental ideologies and children’s after-school activities,” by Dunn, Kinney, & Hofferth.

* 1. (2 points) What additional information should the researchers provide about the setting and key informants for the research above?

More demographic information such as Race, Religion, Household Income, Age of Parents, etc.

* 1. (4 points) Describe 4 qualitatively different types of data that researchers could collect about the participants in the excerpt above.

Kids Questionnaire – Get data about how it all affects children from their perspective.

Parental Questionnaire - Get data about how it all affects parents from their perspective.

Household Demographics. - Get data about parents from an outside perspective.

Report Card - Get data about children from an outside perspective.

* 1. (4 points) Describe each of the following procedures and explain how it would contribute to the validity of the research described above:
* **Triangulation** – This would contribute to validity because the methods performed would triangulate and support a quantitative metric, a qualitative comment, and perform and expert analysis. This helps triangulate data in a way that is hard to argue.
* **Member checking** – This would contribute to validity because the participants could provide feedback if the research methods were believed to be accurate or not. This gives an inside perspective on the research at hands validity.