Question 1: Helping kids too much?

While parental involvement has generally been found to have positive effects on the achievement levels of children, research in this field has also found some counterintuitive results. One intriguing finding has been related to the effect of helping kids with homework. A large scale study that surveyed parental involvement asked parents to indicate the number of hours per week that they helped their children with their homework. Another question asked about the performance of the children on standardized tests. More parental helping was associated with worse scores on the standardized tests. (30 points)

1. For this hypothesis, what are the independent and dependent variables? (5 pts)
2. What statistical test would be used to show a reliable finding? (5 pts)
3. Give two opposing hypotheses that account for this finding but suggest different interpretations about why it occurred. (8 pts)

1. Findings of this type have been used to suggest that parental over-involvement (“helicopter parenting”) may produce negative outcomes for children. Ignoring ethical concerns, outline an experimental approach to testing this hypothesis. Give details of the methods you would use for independent and dependent variables. (5 pts)

1. Explain the ethical issues that would make it difficult to run your proposed design above based on the key issues that are considered by the IRB before approving experimental research. (6 pts)

Question 2: How Meditation Might Boost Your Test Scores

Title from *NYTimes* based on a study from Mrazek et al. (2013)

“Mindfulness meditation, the ancient and [flourishing practice](http://www.nytimes.com/2013/03/23/your-money/mindfulness-requires-practice-and-purpose.html) that increases awareness of random thoughts and redirects attention to the present moment, has been used to manage stress, depression and even chronic pain. But can it improve test scores?” NYTimes

Researchers at the University of California, Santa Barbara, set out to test whether a two-week intensive mindfulness training program would produce improvements in general intelligence. Researchers enrolled 96 undergraduates and half completed a two-week mindfulness training where they focused on breathing exercises to “minimize distracting concerns of the past and future.” The other half of the participants did nothing different than usual over the same time frame. After the two weeks, half the participants took a modified verbal reasoning section of the GRE (mostly vocabulary) and the rest took a modified math GRE section. At the end, many of the people in the mindfulness training group told the experimenters how much they enjoyed being in the study and that they were convinced that mindfulness training improved their intellectual ability. (35 points)

1. What are the constructs being studied in this study? How are they being operationalized? (5 pts)
2. Diagram the experiment here with factors and levels. (5 pts)
3. Identify a weakness of the experimental design and recommend a solution. (5 pts)

Here are hypothetical results from the study:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Descriptive Statistics** | | | | |
| Dependent Variable: score | | | | |
| group | GRE | Mean | Std. Deviation | N |
| Mindfulness | Math | 462.5000 | 29.22923 | 24 |
| Verbal | 515.4167 | 43.61184 | 24 |
| Total | 488.9583 | 45.42891 | 48 |
| Control | Math | 460.0000 | 33.10064 | 24 |
| Verbal | 471.2500 | 35.45512 | 24 |
| Total | 465.6250 | 34.40412 | 48 |
| Total | Math | 461.2500 | 30.91684 | 48 |
| Verbal | 493.3333 | 45.21030 | 48 |
| Total | 477.2917 | 41.76322 | 96 |

1. Verbally describe the two main effects and use the Descriptive Statistics table above in support of your statements. (Note: the statistical analysis and reports will go on the next page, just explain what happened here). (5 pts)
2. Describe interaction between the factors. Be specific about what the interaction indicates about these data. (5 pts)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | |
| Dependent Variable: score | | | | | |
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
| Corrected Model | 48187.500a | 3 | 16062.500 | 12.576 | .000 |
| Intercept | 21869504.167 | 1 | 21869504.167 | 17122.142 | .000 |
| group | 13066.667 | 1 | 13066.667 | 10.230 | .002 |
| GRE type | 24704.167 | 1 | 24704.167 | 19.341 | .000 |
| group \* GRE type | 10416.667 | 1 | 10416.667 | 8.155 | .005 |
| Error | 117508.333 | 92 | 1277.264 |  |  |
| Total | 22035200.000 | 96 |  |  |  |
| Corrected Total | 165695.833 | 95 |  |  |  |

1. Write out the statistical reports of the three tests carried out in the 2x2 ANOVA reported above (just the statistics in the standard reporting format). (5 pts)
2. What do these results mean for original hypothesis of the researchers? (5 pts)

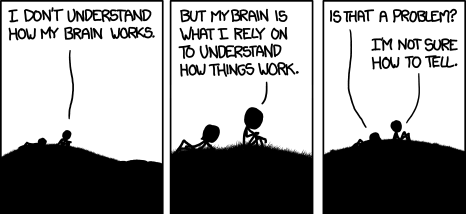
Question 3: Pets and heart attacks

A researcher studying heart disease collected data on a wide range of lifestyle variables. Examining the data, he observed that participants in his study who reported owning a dog were much less likely to have had a heart attack (i.e., dog owners had fewer heart attacks). Finding a statistically reliable result, he concluded that owning a dog was beneficial for health and hypothesized that this was due to the positive effects of canine companionship reducing stress. (25 points)

1. Is this an experimental design? Why or why not? (5 pts)
2. What type of statistical test would the experimenters use to test the hypothesis?  
   (5 pts)

In a follow-up analysis, participants who owned cats were identified and compared to the dog owners. Cat owners were not found to have a lower rate of heart attacks. It was observed that cats differ from dogs in that they do not need daily walks, although they do provide companionship.

1. Give an alternative explanation for the original findings that is consistent with the data but does not support the conclusion of the researcher. (5 pts)
2. How would we use an experimental design to assess the on short-term, immediate effects of pets on stress? Briefly outline a simple design with an appropriate dependent variable for this question. (5 pts)
3. If the proposed design above produced a reliable result, we would establish internal validity. Name an important issue that would need further consideration to establish external validity for broader question of ownership being good for health. (5 pts)



Question 4. Strength and political orientation.

Researchers studying individual differences from an evolutionary psychology perspective collected data on upper-body strength, socio-economic status (SES), and support for economic redistribution (taxing the rich to pay for social programs). Upper body strength was measured as the circumference of the flexed bicep of the dominant arm. SES and opinions on economic redistribution were measured with questionnaires. (20 points)

1. Consider the following three questions that might be used to assess attitudes about economic redistribution:   
     
   For each question, describe a reason why it would not be an ideal item for measuring attitudes. (4 pts each)
2. I believe people with higher incomes should pay higher taxes to support social service programs.

**Circle one: 1 2 3 4 5**

1. How do you feel about redistribution of wealth?

Please write response here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. If I found out that redistribution of wealth made poor people more likely to commit crimes, I would still support it.

**Circle one: True or False**



1. Discussing the theory with the researchers on this project, one scientist tells you the theory is that stronger low-SES men will prefer economic redistribution because they see it as favoring their strength and ability to acquire resources. However another researcher tells you that stronger low-SES men are hypothesized to oppose redistribution because they see it as being state-controlled (taxes and welfare) and not dependent on their personal ability. Using the idea of a “synthetic statement” what problem do these hypotheses pose for this research question? (4 pts)

1. Why is evolutionary psychology an area in which experimental work is impossible? What inferential challenges does this pose? (4 pts)

