Question 1. Laptops in the classroom have an increasingly poor reputation. In addition to the possibility of distraction due to multi-tasking, it was hypothesized that just the act of note-taking via a keyboard might be less effective for learning than writing notes on lecture material longhand (e.g., with pen and paper). A researcher interested in this hypothesis decided to explore this possibility via survey. She identified a group of students in Introduction to Psychology who reported using laptops occasionally to take notes in class. She surveyed the students once a week throughout a quarter, asking them to report how often they had used their laptop to take notes in class that week. At the end of the semester, she totaled up the number of times each student reported using their laptops and obtained the final grade of each student from the professor. She found that greater laptop use was associated with poorer grades in the class. (32 points total)

1. In this study, what are the independent and dependent variables? (4 pts)
2. What statistical test would be used to assess the reliability of the possible effect of the IV on the DV? (4 pts)
3. Is this an experimental design? Why or why not? What are the consequences for internal and external validity of the study? (6 pts)
4. Can the researcher safely conclude that using a laptop for notes leads to less learning? Give two alternate hypotheses that account for the data without supporting that conclusion. (4 pts)
5. Give an ethical issue specific to the design of this study that would need to be considered. What would you advise the researcher about experimental procedures to ensure this was handled properly. (6 pts)
6. We can get more directly at the question of whether handwritten notes lead to better memory for studied material with a new, different experiment. Describe a two group study that would test the researcher’s hypothesis. Explain the independent and dependent variables you would use. (8 pts)

Question 2: Frenda et al. (2014) examined the effect of sleep deprivation on susceptibility to false memory formation. To investigate this, the researchers randomly assigned participants to be either sleep-deprived (stayed awake overnight) or not sleep-deprived (slept for 8 hours overnight). To measure susceptibility to false memories, all participants first observed a series of photographs. After viewing the pictures, a narrative story was provided that described actions behind the pictures but contained a number of deliberately misleading statements, that is, things that were incorrect about the actual pictures seen. Half of the participants completed the pictures and misleading story part of the experiment the night before the sleep/no-sleep manipulation. The other half watch the pictures and then heard the story in the morning. All participants completed a test phase in the morning that included multiple choice questions about the photographs. The measure of false memory was the number of questions on this test for which the participants selected answers that were based on the inaccurate story information. (36 points total)

1. What are the 3 constructs being studied in this experiment? How are they being operationalized? (9 pts)
2. Diagram the independent/dependent variables and their level(s) (6 pts)

The following SPSS output for a hypothetical version of the above experiment are to be used to answer questions (c) to (e) on the following page.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Descriptive Statistics** | | | | |
| Dependent Variable: # false memories | | | | |
| Study  Time | Sleep  Condition | Mean | Std. Deviation | N |
| AM | Sleep | 10.13 | 3.137 | 15 |
| Deprivation | 15.93 | 3.515 | 15 |
| Total | 13.03 | 4.406 | 30 |
| PM | Sleep | 11.33 | 4.220 | 15 |
| Deprivation | 13.47 | 2.295 | 15 |
| Total | 12.40 | 3.510 | 30 |
| Total | Sleep | 10.73 | 3.704 | 30 |
| Deprivation | 14.70 | 3.175 | 30 |
| Total | 12.72 | 3.962 | 60 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | |
| Dependent Variable: # false memories | | | | | |
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
| Corrected Model | 292.450a | 3 | 97.483 | 8.614 | .000 |
| Intercept | 9702.817 | 1 | 9702.817 | 857.392 | .000 |
| Study Time | 6.017 | 1 | 6.017 | .532 | .469 |
| Sleep Cond | 236.017 | 1 | 236.017 | 20.856 | .000 |
| Study Time \* Sleep Cond | 50.417 | 1 | 50.417 | 4.455 | .039 |
| Error | 633.733 | 56 | 11.317 |  |  |
| Total | 10629.000 | 60 |  |  |  |
| Corrected Total | 926.183 | 59 |  |  |  |

1. Describe the reliable main effect and use the hypothetical Descriptive Statistics table above in support of your statement. (6 pts)
2. Describe the interaction between the IVs. (6 pts)
3. Write out the statistical reports of the three tests in the standard APA format including all the standard reporting information. Include the inferential statistics and a statement about the direction of the effect (9 pts)

Question 3. Does shared pain bring people together? Jetten & Ferris (2014) reported several studies suggesting that it can. Consider a student-run class project aiming to further test this idea. In this project, participants were asked to endure a “cold pressor” stimulus in which they kept one arm submerged in ice water for as long as possible. Participants worked in pairs and were randomly assigned to complete this task either individually (separate rooms) or together in the same room. After experiencing this pain, participants then together completed a task to assess cooperation that is known as the “Prisoner’s Dilemma” game. In this game, 2 participants are given a hypothetical scenario where they are guilty of a crime (e.g., illegally downloading and watching a movie that is still in theaters) and are being questioned because the authorities cannot tell which person is the real culprit. Each person has to decide whether to (a) stay quiet and refuse to say anything negative about the other; or (b) turn in the other player as the main culprit. The first option is considered to be “cooperating” with the other player and the second option is considered “defecting” against them. After reading the scenario, each player indicated which of the two actions they would take. The researchers found that after a shared pain experience, participants selected the “cooperation” option at higher rates than after individual pain experiences. They concluded that a shared painful experience led to more cohesion among people who shared that experience. (32 pts)

1. What are the IV and DV for this study? What statistical test would be used to assess the reliability of the effect of the IV on the DV? (8 pts)
2. Suppose in reviewing the data from the study, you observed that the participants in the shared pain condition also were able to withstand the painful stimulus for longer periods of time than those who did it individually. Explain the validity threat this poses and explain the alternate hypothesis. (8 pts)
3. Suppose you also found out that participants in the study signed up on a list, usually in groups of friends. Participants in the study were run in order on the list, so that the pairs of participants tended to know each other. What limitation on the study’s conclusions would this have? (8 pts)
4. Modify and improve the design of the study with 3 changes. Describe a (minor) change the IV to correct the problem in (b), a procedure for assignment to conditions that corrects the problem in (c) and provide an alternate DV that measures bonding (cohesion) between the pairs of participants. (8 pts)