**QUESTION TWO**

The validity of eyewitness testimony remains a topic of debate in the behavioural sciences. It has been previously suggested that the wording used when asking an eyewitness to recall their recollection of an event may influence their responses. If subtle wording of questions can influence the answer an eyewitness gives, then such reports must be interpreted with considerable caution.

Forty individuals completed a study where they watched a film of a car accident. *Car A* fails to stop at stop sign and collides with *Car B*. The film depicts the entire incident, beginning 30 seconds before the collision, the collision, the arrival of the police officer and citation of the driver in *Car A*. After watching the film, the 40 participants are randomly split into four groups – each group is asked to estimate the speed of *Car A* in each of the following ways:

*Group 1:* “how fast was Car A going at the time of the **ACCIDENT** with Car B?”

*Group 2:* “how fast was Car A going when it **HIT** Car B?”

*Group 3:* “how fast was Car A going when it **CRASHED** into Car B?”

*Group 4:* “how fast was Car A going when it **SMASHED** into Car B?”

The relevant output to answer the below question is provided:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tests of Homogeneity of Variances** | | | | | |
|  | | Levene Statistic | df1 | df2 | Sig. |
| Speed Estimate (KMs per hour) | Based on Mean | .690 | 3 | 36 | .725 |
| Based on Median | .356 | 3 | 36 | .875 |
| Based on Median and with adjusted df | .356 | 3 | 36 | .875 |
| Based on trimmed mean | .519 | 3 | 268 | .759 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ANOVA** | | | | | |
| Speed Estimate (KMs per hour) | | | | | |
|  | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 1979.00 | 3 | 619.785 | 13.965 | .000 |
| Within Groups | 1851.400 | 36 | 56.432 |  |  |
| Total | 3830.400 | 39 |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Robust Tests of Equality of Means** | | | | |
| Speed Estimate (KMs per hour) | | | | |
|  | Statistica | df1 | df2 | Sig. |
| Welch | 7.757 | 3 | 19.405 | .001 |
| a. Asymptotically F distributed. | | | | |

1. Looking at the output above, which **one** of the ANOVA assumptions are you able to assess? Justify with statistical evidence whether this assumption is met or is violated. **(2 marks) (50 words)**
2. What does the *p* value in your answer to 2a represent? **(2 Marks) (40 words)**

Before the experiment, the researcher specified four comparisons of theoretical interest shown in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contrast Coefficients** | | | | |
| Contrast | Group | | | |
| Accident | Hit | Crashed | Smashed |
| 1 | 3 | -3 | 0 | 0 |
| 2 | 3 | 3 | -3 | -3 |
| 3 | 0 | 3 | -3 | 0 |
| 4 | 6 | -2 | -2 | -2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Contrast Tests** | | | | | | | |
|  |  | Contrast | Value of Contrast | Std. Error | t | df | Sig. (2-tailed) |
| Speed Estimate (KMs per hour) | Assume equal variances | 1 | -5.10 | 9.621 | -.530 | 36 | .599 |
| 2 | -53.40 | 13.607 | -3.925 | 36 | .000 |
| 3 | -2.70 | 9.621 | -.281 | 36 | .781 |
| 4 | -42.40 | 15.712 | -2.699 | 36 | .011 |
| Does not assume equal variances | 1 | -5.10 | 7.072 | -.721 | 17.034 | .481 |
| 2 | -53.40 | 13.607 | -3.925 | 27.743 | .001 |
| 3 | -2.70 | 8.958 | -.301 | 17.107 | .767 |
| 4 | -42.40 | 12.248 | -3.462 | 25.538 | .002 |

1. Report a statistical sentence and interpret the results for the planned comparison between the combination of the accident and hit groups (*accident + hit groups*) to the combination of the crashed and smashed groups (*crashed + smashed groups*). **(2 Marks) (30 words)**
2. What alpha level should be used to assess the statistical significance of this comparison? Why? **(2 Marks) (50 words)**
3. For the above study, the researchers were concerned about the influence of the individual differences factor ‘driving experience’. Outline one adjustment to either the design or analysis that could help account for the influence of driving experience on the dependent variable. Why is the adjustment you chose better than other alternatives? **(4 Marks) (100 words)**