



Lecture 1.x

Review

Do gaming preferences change with age?

To understand how gaming preferences might change over a lifespan, a survey was conducted of 426 adults aged over 19 years.

The age of participants was recorded in the ranges 19 - 39 years, 39 - 59 years, and 60+ years.

Participants were asked “If you were asked to play a video game, how important is it that the game has a good storyline?” and they responded on a 1 - 5 scale (1 not important - 5 very important).

It was found that younger adults considered a good storyline more important than older adults ($p < 0.001$).

Questions

What type of variable is recorded age? **Categorical - ordinal**

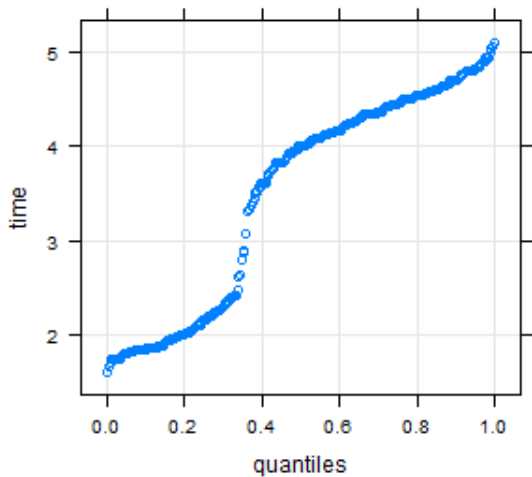
What type of variable is the response? **Quantitative - discrete or Categorical - ordinal**

What type of study is this? **Observational study**

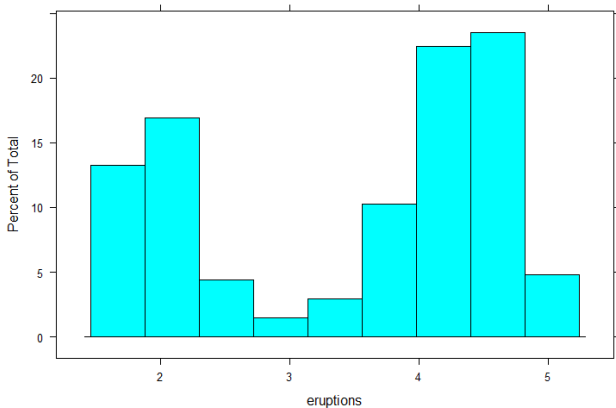
What would be a suitable null hypothesis? **All age groups rate the importance of a good storyline at the same level on average.**

What are we able to conclude? **There is strong evidence against the null hypothesis, suggesting the age groups rate the importance of a good storyline differently.**

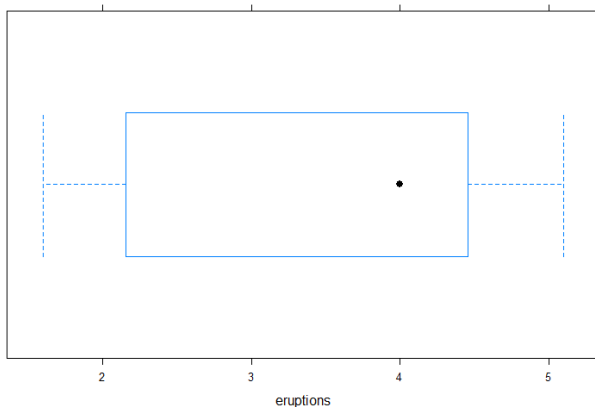
Eruption times from a geyser in Yellowstone National Park



Eruption times from a geyser in Yellowstone National Park



Eruption times from a geyser in Yellowstone National Park



Questions

The five-number summary (min, Q1, median, Q3, max) for this data is

- (a) 1.60, 2.16, 4.00, 4.46, 5.10
- (b) 1.50, 2.00, 3.24, 4.12, 5.21
- (c) 1.40, 3.11, 4.09, 4.52, 5.05
- (d) 2.02, 3.11, 4.00, 4.46, 5.05
- (e) 1.60, 2.10, 4.00, 4.24, 4.57

Questions

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Questions

Would any observations from the eruption time data be flagged as unusual using the $1.5 \times IQR$ rule?

- (a) No
- (b) Yes, on the left
- (c) Yes, on the right
- (d) Yes, on both sides

Questions

Would any observations from the eruption time data be flagged as unusual using the $1.5 \times IQR$ rule?

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Survey data

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addmargins(table(survey$Handed,survey$Eyes))
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| | Black | Blue | Brown | Green | Hazel | Sum |
|-------|-------|------|-------|-------|-------|-----|
| Left | 3 | 20 | 22 | 4 | 5 | 54 |
| Right | 82 | 119 | 200 | 45 | 38 | 484 |
| Sum | 85 | 139 | 222 | 49 | 43 | 538 |

What proportion of students are Blue eyed and left-handed?

$$20/538 \approx 0.037$$

What proportion of students with Brown eyes are right-handed?

$$200/222 \approx 0.901$$

Middle-of-the-night Insomnia

Middle-of-the-night (MOTN) insomnia is a common form of insomnia whose prevalence increases with age. A study was conducted to determine the efficacy of different dosages of triazolam when taken after a MOTN awakening with difficulty returning to sleep.

In the study 24 patients (mean age 41.00 ± 10.40 , 10 female and 14 male) affected by MOTN insomnia were recruited and randomly allocated to one of three dosage groups: A (placebo - no triazolam), B (low dose triazolam), C (high dose triazolam).

After 2 weeks of treatment, both low dose and high dose triazolam groups showed increased total time of sleep (in mins) relative to the placebo group (low dose: $p = 0.029$, high dose: $p = 0.004$).

Questions

What type of variable is total time of sleep? Quantitative - continuous

What type of variable is the dosage? Ordinal

What type of study is this? Designed experiment

What would be a suitable null hypothesis? Triazolam (low dose/high dose) has no effect on the patient's average total time of sleep.

What are we able to conclude about the effect of low dose triazolam? There is moderate evidence against the null hypothesis, suggesting that low dose triazolam increases total time of sleep.