

Research methods and statistics

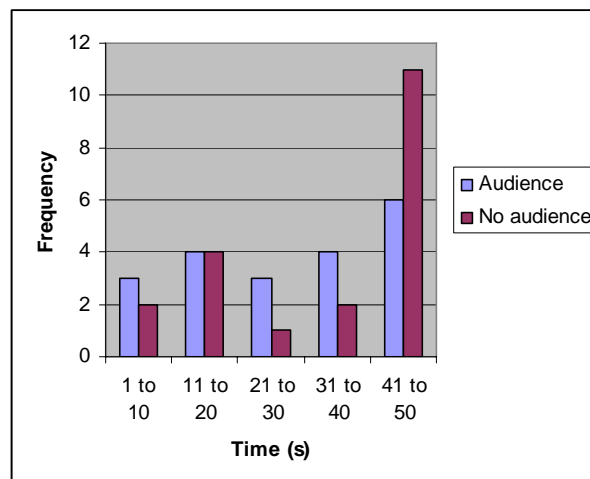
Fakedata and Fraud (2007) carried out some research into gender differences in response to an emergency situation. They had read some prior research that suggested men are more likely to help someone in distress if there is the chance of appearing heroic by doing so. Fakedata and Fraud designed a field experiment to test this idea.

The research took place in a subway in an urban area. Lookouts kept watch on the approaches to the subway and alerted a confederate by mobile phone if a lone male was coming. As he entered the subway a confederate would enter from the other end and, once visible to the participant, would clutch his chest and fall to the ground as if ill. At this point, a stopwatch was started. It was stopped once either (a) the man had stopped to help the confederate or (b) fifty seconds had elapsed, whereupon it was judged that help had not been given.

This procedure was conducted twenty times under each of two conditions. In the experimental condition a group of three attractive young women, also confederates, were positioned at the exit of the subway, also within sight of the participant. In the control condition there were no additional confederates.

1. What was the aim of Fakedata & Fraud's study?
2. State a suitable alternative hypothesis for this experiment.
3. Is the hypothesis you stated for question 2 directional or non-directional? Explain your answer.
4. How did the researchers operationalise 'the chance of appearing heroic'?
5. How might they have operationalised 'stopping to help'?
6. What was the dependent variable in this experiment?
7. What experimental design was used in this investigation?
8. Explain one ethical issue raised by Fakedata & Fraud's experiment and suggest what could have been done about it.
9. Identify one extraneous variable and explain the effect it could have had on the outcome of this investigation.
10. Identify the sampling technique used by Fakedata and Fraud and explain how it would affect their ability to generalize from the results of this investigation.

Audience	No audience
50	50
50	50
50	50
50	50
50	50
47	50
39	50
37	50
36	50
32	50
26	48
22	36
21	32
18	24
18	15
18	12
17	11
10	11
8	10
8	10



Summary table of results

	Audience	No audience
Mean	30.35s	35.45s
Standard deviation	15.54s	17.59s

Here are the researchers' raw data, a chart and their summary table of results.

11. What type of chart have the researchers used to present their data? Suggest a suitable title for their chart.
 12. What conclusions might be drawn from the summary table of results presented by Fakedata & Fraud?
 13. Mr Cline (2008) reanalyzed these data and came to the conclusion that Fakedata & Fraud had chosen a poor measure of central tendency. How might this criticism be justified?
- Fakedata & Fraud carried out an inferential statistical test on their data before deciding whether to accept their alternative hypothesis. They used a t-test for related data. Their analysis led them to conclude that the difference in times between their conditions was significant (1 tailed $p < 0.01$).
14. Why was it necessary for the researchers to use an inferential test to analyse their data?
 15. Under which conditions is it generally suitable to use the t-test for related data?
 16. Explain what it means to say that 'the difference in times...was significant (1 tailed $p < 0.01$)'?
 17. During his reanalysis, Mr Cline realised that Fakedata & Fraud had made a fundamental error when choosing their statistical test and that, as a result, their conclusion was not valid. What was the error that the researchers made, and what would have been a more appropriate test?
 18. Mr Cline also expressed his concern that the use of a parametric test was not justified. Identify a suitable non-parametric alternative test for this investigation and explain your choice.

Bonus question: why might these data be considered unsuitable for analysis using a parametric test?