



Unreliable inferences

Exercises

1. Factors affecting student achievement

In this exercise read the following report and then decide which of the inferences below might be drawn from this evidence. How many are relevant and reliable?

A study of first year undergraduates at the University of Newington revealed that 'there was an inverse relationship between grade averages and smoking. Of students with an 'A' average, only 16.7 per cent smoked, while 59.1 per cent of the 'E' average students smoked.' The same investigation showed that 'the greater a student's involvement in extracurricular activities, the less likely he or she is to smoke' and that 'the incidence of smoking increased with the amount of money they had to spend.'¹

1.1 Students smoke more when they are anxious as a result of doing poorly in their assignments.

1.2 Students do poorer work because they are heavy smokers.

1.3 Students with low averages and few extracurricular activities are idle. They spend their abundant free time at parties and in bars, where smoking is common. That is why they smoke more than other students.

1.4 Heavy smoking is a sign of students who have difficulty in their assignments and in adjusting to university life.

1.5 Students who smoke are intellectually inferior to those who don't, because a) they disregard the warning that 'smoking will harm your health' and b) they get low grades.

1.6 If students have more to spend than they should, a) they are more likely to smoke, and b) they are more likely not to care about getting good grades.

1.7 Students who budget their money are likely to be better students than those who have enough money to buy cigarettes, since the former are more likely to realise the value of a good education.

What other inferences may be drawn from the evidence? On the basis of this evidence, is it possible to establish any causal connection between smoking, academic performance, extracurricular activities and the possession or lack of money to spend?

2. Safest drivers – women or men?

Citing official data from different parts of the country showing that men are responsible for twice as many fatal car accidents as women, a reporter concluded that women drivers are twice as safe as men. What factors has this reporter failed to take into consideration?



3. Literacy rate in the nineteenth century

In the nineteenth century statistics on the literacy rate in England were based on the number of men and women who were able to write their names at the time they were married. In 1861 the percentage of bridegrooms who could do so was 69.3; of brides, 54.8. In 1900 the percentages were 97.2 and 96.8 respectively. Can we conclude from this that by 1900 practically everybody in England could read and write?²

4. The reliability of statements

Assess the reliability of each of the following statements, paying particular attention to these questions:

- 1 Do they take account of the implications of the terms used – are these terms clearly defined?
- 2 If the statement is based on an accumulation of evidence, how much evidence and what kind would justify the generalisation?
- 3 If it is a causal statement, does it take into account that there could be more than one cause?

4.1 If you prohibit the taking of pictures of people and events that are in the public interest, you are interfering with the freedom of the press.

4.2 All of those at the party who were sick had eaten the roast chicken, but some who had eaten it were not sick. So, the chicken cannot be the cause of the outbreak of food poisoning.

4.3 There is obviously some connection between a bird's sense of direction and radio waves. The homing instinct of pigeons is weakened or destroyed when they are in the vicinity of radar installations.

4.4 If it were just a few crackpots reporting sighting UFOs, you would be confident in saying that there weren't such things. But when there are thousands of reports, there is strong probability that they exist.

4.5 This airport is obviously unsafe; there have been three crashes here in as many years.

¹ Adapted from an example in Richard D. Altick, *Preface to Critical Reading* (New York: Holt, Rinehart and Winston, 1969), pp. 323-4.

² Adapted from an example in Altick, *Preface*, p. 321.