News, Comment and Reviews

Review of *Statistics: A Very Short Introduction* by David J. Hand. Oxford: Oxford University Press, 2008. 124pp. £7.99. ISBN: 9780199233564 paperback.

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I must confess that I was not as open to Oxford University Press' Very Short Introductions series as I should have been. This explains my tardiness in finally engaging with and growing to admire this introductory text. For too long I assumed it was a dumbing-down of statistics, rather than the gentle and rather absorbing 'taster' it is.

Chapter one begins with a disarming quotation which neatly serves to engage the reader through responding to a routine anti-statistical phrase:

To those who say 'there are lies, damned lies, and statistics', I often quote Frederick Mosteller, who said that 'it is easy to lie with statistics, but easier to lie without them'.

The text proceeds to introduce readers to a brief background to statistics before briefly discussing seven examples of statistics in action in the public realm (Spam filtering; the Sally Clark case; Star clusters; Manufacturing chemicals; Customer satisfaction; Detecting credit card fraud; Inflation). The following chapters introduce topics such as descriptive statistics (chapter 2), data quality (chapter 3), and probability (chapter 4). Later chapters focus on issues such as estimation & inference (chapter 5), statistical models and methods (chapter 6), before concluding with a very brief chapter on statistical computing.

To give more detail, Chapter three for example which examines '*Collecting good data',* starts with a quote from R.A. Thisted *'Raw data, like raw potatoes, usually require cleaning before use'*. Outlining the issue of incomplete data and sample bias Hand outlines the *'classic case'* of the 1936 US presidential election in which the Literary Digest incorrectly predicted a Landon victory over Roosevelt. This was the result of a mail survey posted only to a skewed (more affluent) sample of people who owned both telephones and cars. Hand also engages the reader through his description of what he terms the '*minor statistical classic*' case of the *Challenger* space shuttle explosion in 1986, which killed all seven astronauts. Hand outlines how examination of an incomplete dataset led to the erroneous assumption that there was no relationship between air temperature and damage to booster rocket seals.[1] Through this

[1] Editor's note: A public inquiry tried to ascertain what went wrong with Challenger. Richard Feynman was a panel member but, unlike most of the panel members, Feynman went to talk to the engineers, mangers, and others associated with the flight and the engineering of the shuttle. After one meeting, an Air Force captain whispered that he ought to have a look at the seals, the 'o-rings'. In his position, the captain was unable to say anything, but Feynman could discuss what he discovered.

chapter Hand continues to outline, with examples, issues of error propagation, pre-processing data and experimental design.

Hand boldly states that '*statistics is the most exciting of disciplines'*. Although he may not succeed in converting the majority of readers to that point of view, he will I believe succeed in making many pause to appreciate the potential of the discipline. The text is throughout a fine example of clarity in writing, which it must be acknowledged is no small achievement in the field of statistics. The examples and discussion throughout are clear, logical and perhaps most important of all for some students, non-threatening. The book provides only a basic introduction to the field. However, if students such as mine (in the field of social care and humanities) could grasp these concepts clearly, through the use of such a text, they would emerge more competent and confident than is usually the case.

Of course finding this text both useful and likeable constitutes a sort of invitation to explore the rest of the VSI (Very Short Introductions) series, all 370 or so of them…

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Feynman discovered that engineers had told management that there might be a problem with the o-rings and that the flight should be delayed. Management disagreed and the flight went ahead.

The suspected problem was that the o-rings might become too rigid when cold and thereby fail to return to their original shape when later warmed. Feynman decided to test this hypothesis publicly, after testing it privately. When the panel met in public, Feynman brought a glass of ice water to the table in which sat an o-ring clamped with a clothes pin. He placed the glass of water in front of him on the long table and left it there while the panel began discussions.

After half hour, Feynman began to talk about his experiment with the glass of ice water and the crimped o-ring. The question was what shape the o-ring would assume when it was removed from the ice water and the clothes peg removed. To the astonishment of members of the panel and the audience, when removed, the o-ring did not return to its original shape. Feynman concluded that since the conditions in the glass were less extreme than those the o-ring might meet attached to the shuttle, it was quite likely that, under such extreme conditions, the o-ring would remain in a deformed state, fail to seal properly and therefore leak, with potentially disastrous consequences.

This simple experiment conducted publicly was critical to the entire inquiry. Further investigation showed that the o-rings, when deformed, did not always return to their original shape and therefore could fail to perform the function for which they were designed, just as Feynman had shown with his simple experiment. Further investigation also revealed that people knew why the shuttle caught fire, but were prevented from speaking out due to NASA's culture of secrecy. Managerialism rather than scientific inquiry had prevailed with disastrous consequences, not only for the astronauts but also for NASA's space program, which would take a long time to recover from this preventable 'accident'.