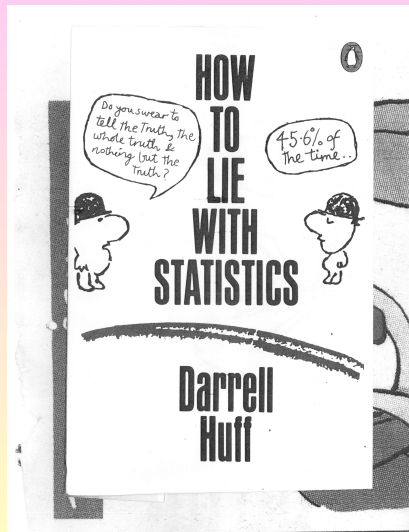


# How to Lie with Statistics

Malcolm Farrow  
(based partly on the book by Darrell Huff)

September 2010

Huff, D., 1954. *How to Lie with Statistics*, Penguin.



“Lies, damned lies and statistics”

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- In 1897 [Leonard Courtney](#) became President of the Royal Statistical Society.

THOMPSON

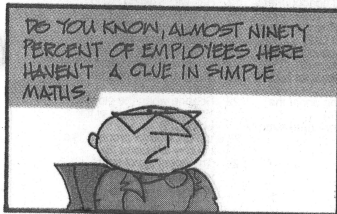
AND THIS ONE'S FOR  
MANIPULATING STATISTICS



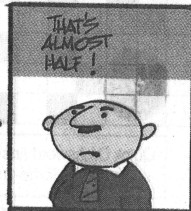


# Percentages

## THREADNEEDLE



NINETY PER CENT. EH?



# Percentages

... of what?

# Percentages

... of what?

- Pay: £1000 per month.

# Percentages

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- “Sorry guys. You have to have a 10% pay cut.”

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# Percentages

“A separate opinion poll yesterday suggested that 50% of obese people earn less than the national average income.”

*The Guardian* 3 November 2009



## Percentages

“40% rise in swine flu deaths in 48 hours as two more die.”

“The number of swine flu deaths in Scotland has soared by 40% in just 48 hours, after the Scottish Government confirmed that a further two people died after contracting the virus.

Their deaths take the total swine flu fatalities to 14, . . .”

*Glasgow Herald*, 13 October 2009

# Percentages

“I must write again about the misleading adverts by GMPTE in the papers re the Congestion Charge. In their latest round of propaganda they state there will be a 10 per cent increase in bus services. With 10 councils in Greater Manchester this works out at a one per cent increase per council. If Stockport’s bus companies run 200 buses in the morning peak, a one per cent increase will give two extra buses; is that what you want?”

*Letter to Stockport Express, 26 November 2008*

## Percentages

- “85% fat free!”

## Percentages

- “85% fat free!”
- “15% fat!”

## Percentages

“Guaranteed minimum return of up to 6%”

Advert for Stanley Gibbons (Guernsey) Ltd. in *The Spectator* 15  
November 2008

## The wrong proportions

“People who have personalised number plates on their cars are most likely to live in Scotland, a survey has found.”

*BBC News Scotland 11 January 2009*

# The wrong proportions

## The wrong proportions

- “More than 90% of cold-sufferers treated with Farrow’s Cold Cure had relief from symptoms within seven days.”



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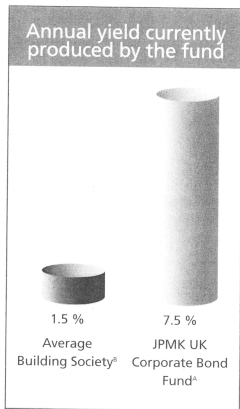
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- The “Prosecutor’s Fallacy.”

# Misleading Relationships

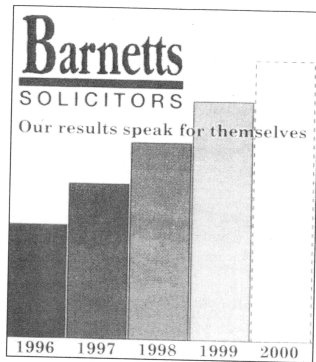
- “Lurking variables” .
- Storks and babies.
- Simpson’s Paradox.

## Graphs



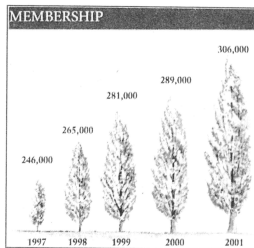
Promotional publication, 2002  
JP Morgan Fleming Asset Management

# Graphs



*Southport Midweek Visitor*  
21 January 2000

# Graphs



2001 Review  
Royal Horticultural Society

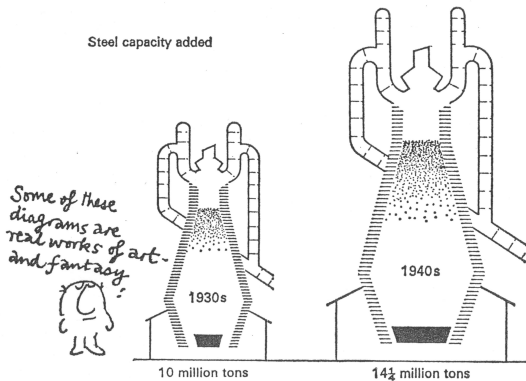
# Graphs



*The Times*  
1 February 2003



# Graphs



Adapted by courtesy of Steelways.

# Graphs

The darkening shadow (Western style)

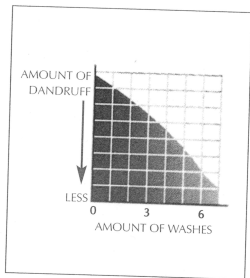


(Eastern style)



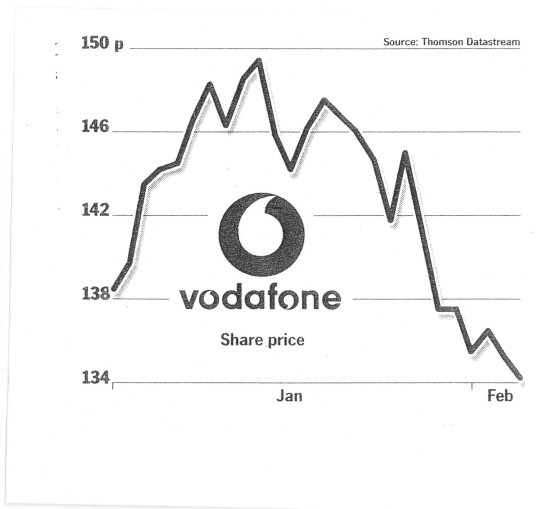
To show we aren't cheating, we added MD, DEL., and R.I. for good measure

# Graphs

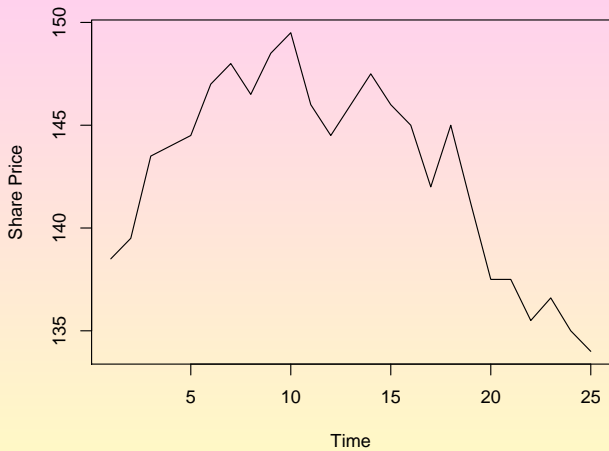


bottle label  
'Head & Shoulders' shampoo

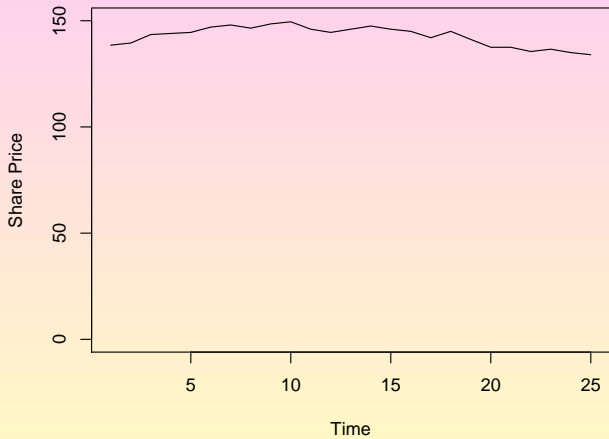
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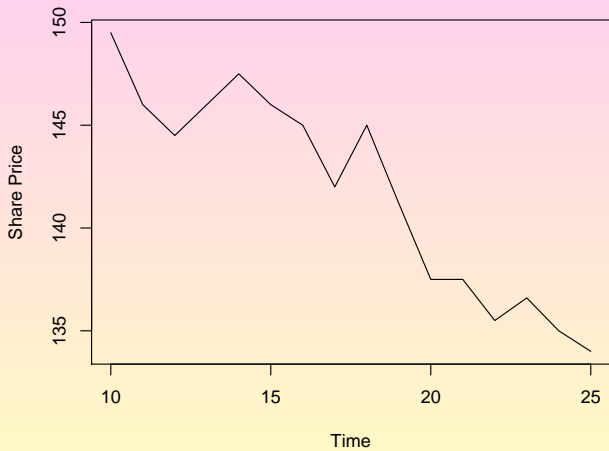
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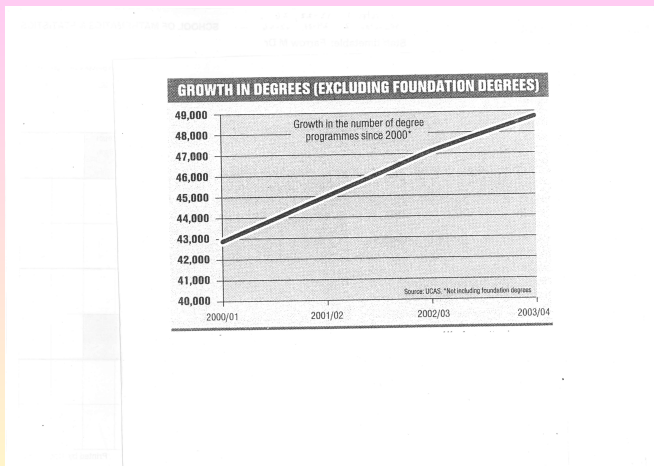
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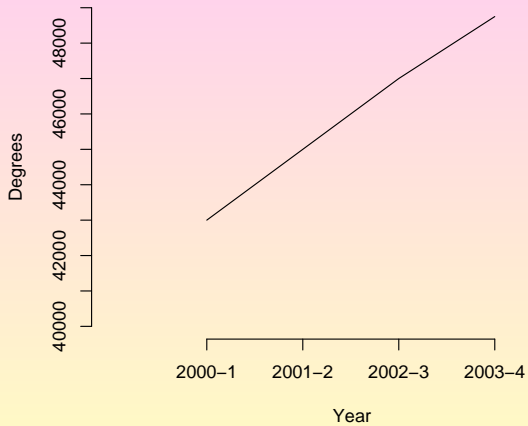
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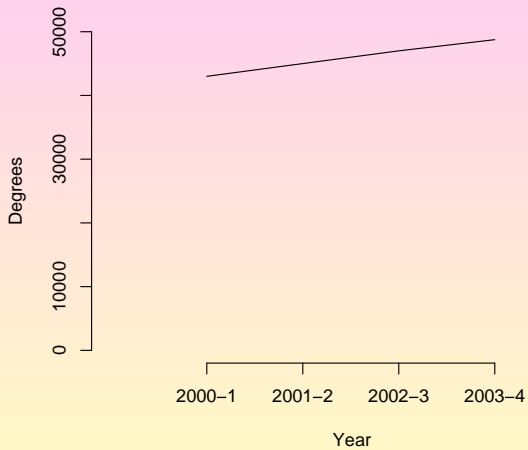
*The Times Higher* 23 January 2004



# Graphs



# Graphs



# Surveys

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- Whom did they ask?

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# Surveys: The 1936 US Presidential Election

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- Will you understand the subject's response?

## Survey Questions: Examples

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## Survey Questions: Examples

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- “Joining the European Monetary Union would have many benefits for Britain in terms of jobs and prosperity. Do you believe that Britain should join?”
- “Do you believe that Britain should scrap the pound and hand over control of our economy to bureaucrats in Brussels and German bankers?”

## Survey Questions: Examples

- “When driving a car, how often do you break the speed limit?”
  - All the time
  - Very often
  - Fairly often
  - Only sometimes
  - Never”
- “Which of these magazines do you usually read? ...”
- “Which of these magazines have you read in the last month?  
...”
- “How many times a day do you clean your teeth?”

# Averages

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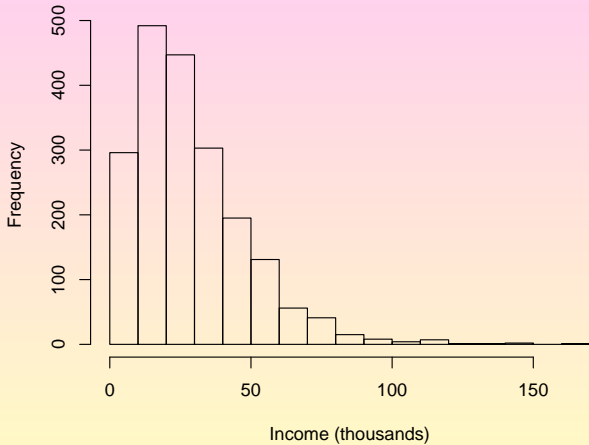
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- Who was counted?
- E.g. “average family”: what counts as a “family”?
- Has the population changed?
- Hardly anyone is average!

# Averages

**Histogram of Income**



## Averages

Mean income: £28720.  
Median income: £24042.  
Modal income: around £14300.

How to talk back to a statistic.

## How to talk back to a statistic.

- Who says so?



## How to talk back to a statistic.

- Who says so?
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## How to talk back to a statistic.

- Who says so?
- How do they know?
- What's missing?
- Did somebody change the subject?
- Does it make sense?

## Hope for the future?

- Office for National Statistics (ONS)
- ONS made independent of Government by the **Statistics and Registration Service Act, 2007**.
- **National Statistician (Head of ONS)**