

FMS1203S: Randomness in scientific thinking

Week 5

Misleading with or without data

Information: good or bad?

- ▶ In the era of information, we are bombarded with data from a variety of sources: TVs, radios, newspapers, social media, mobile phones, etc. We receive information proactively or passively.
- ▶ We make decisions about our life based the information we have.
- ▶ Many sources of information have an attempt to influence our choices. Is information good or bad? ,
- ▶ We can be mislead either by irrelevant data or by partial data purposely selected in advertising.

Misleading by withholding crucial data

- ▶ As an example of withholding data relevant to consumers, consider the tobacco industry.
- ▶ Scientists working for tobacco companies have clearly known for a long time about the carcinogenic effect of tobacco smoke. This is well documented, and one of the readings for next week discusses some of the evidence.
- ▶ However, there was a refusal to publicly concede the link between smoking and cancer long after relevant information was known to tobacco company executives.

Misleading with irrelevant data

- ▶ One industry well known for making misleading claims is the cosmetics industry. Although advertising is usually tightly regulated it is possible to mislead without telling a straight out lie.
- ▶ The Guardian columnist Ben Goldacre (*Bad Science*, p. 25) put it this way: "The link between the magic ingredient and efficacy is made only in the customer's mind, and reading through the manufacturer's claims you can see that they have been carefully reviewed by a small army of consultants to ensure that the label is highly suggestive, but also - to the eye of an informed pedant - semantically and legally watertight".

Misleading with irrelevant data (cont.)

- ▶ When data are used to support misleading claims in advertising it appears to give the authority of science to claims.
- ▶ To quote Goldacre again on the cosmetics industry, "Classically, cosmetics companies will take highly theoretical, textbookish information about the way that cells work - the components at a molecular level, or the behaviour of cells in a glass dish - and then pretend it's the same as the ultimate issue of whether something makes you look nice. 'This molecular component,' they say, with a flourish, 'is crucial for collagen formation.' And that will be perfectly true ... but there is no reason to believe that anyone is deficient in it, or that smearing it on your face will make any difference to your appearance. In general, you don't absorb things very well through your skin, because its purpose is to be relatively impermeable."
- ▶ So one way to mislead with data in advertising is to provide data of an irrelevant but suggestive kind.

Readings for next week

Group one: Perlman, Patrik (2013). When will we see people of negative height? *Significance*, 10 (1), pp. 46–48.

Group two: Rosenthal, Jeffrey S. (2005). *Struck by Lightning: The Curious World of Probabilities*, Granta Publications (Chapter 6, Utility Functions: How to Make Decisions).

Group three: Cummings, K.M., Morley, C.P. and Hyland, A. (2002). Failed promises of the cigarette industry and its effect on consumer misperceptions about the health risks of smoking. *Tobacco Control*, 11 (Suppl 1):i110–i117.

Group four: Goldacre, Ben (2008). *Bad Science*, , (Chap6, The Nonsense du Jour, 86-111).

Group five: Goldacre, Ben (2008). *Bad Science*, , (Chapter 8, Pill solves complex social problem, 136-160).