

# Poor maths means shoppers pay more, study finds

Shoppers are making basic maths errors that are costing them money, researchers have found. Successful retailers are experts at exploiting our natural inability to think properly about price.



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Imagine two boxes of detergent. Both are the same size. Both are on special offer. In one case, shoppers are getting 20% off. In the other, they are getting 25% extra, free. Which box would you buy?

According to a newly published study in the *Journal of Marketing*, customers show a significant preference for the box with 25% extra free. But, as mathematicians will already have worked out, a 20% discount and a 25% bonus are in fact exactly the same.

Say detergent costs a pound for each 100 grams. Take a 500g box selling at five pounds. Cut 20% off the price. You end up with a 500g box for four pounds.

Then take a 400g box selling for four pounds and add 25% – a quarter – to the contents. A quarter of 400g is 100g. Add them together and you end up, once again, with a 500g box for four pounds.

This sort of maths may look boring, but it is important. Small differences add up,

and manufacturers have made millions from people who thought that 25% extra free was the same as 25% off the price.

And that is hardly the only trick sellers use to squeeze more money out of unwary shoppers. It is well known, for example, that customers who avoid something at £4 may buy it for £3.99. Less obvious, but just as effective, is to offer one expensive product to make all the others look cheap. A shop selling food processors at £50 might add a premium model for £200. No one will buy the premium, but the newly cheap-looking one will fly off the shelves.

Then there are the shops that offer big products like TVs at very good prices but then offer a lot of small but overpriced extras after the customer has closed the deal. Some electronics chains make all their profit not from the goods themselves but by selling worthless product insurance at the till.

This is the sort of thing that gives old-fashioned economists nightmares. In the perfect world of economic theory, customers are rational buyers with a good idea of how much things are worth. That means companies have to sell products at a fair price.

But a growing body of academic evidence shows that the reality is rather different. In fact, facing the cunning tactics of the retail giants, shoppers are surprisingly easy to fool.

#### TRICKS OF THE TRADE

Some commentators find all this psychological manipulation and mathematical trickery rather shocking. Shoppers need protection, they say, from the shady behaviour of unscrupulous stores.

No one is forcing anyone to buy anything, others point out. Shopping is a contest, in which buyers and sellers compete to get the best deals out of each other. If buyers are fooled – too bad for them. It's all in the game.

#### Q & A

**Q** So the moral of the story is... don't go shopping?

**A** The real moral is: don't underestimate the power of maths. Something simple like understanding percentages can make a big

difference in everyday life.

**Q** Well, now I'm wise to the 'extra free' trick, what else is there?

**A** One thing customers are notoriously bad at is calculating the effect of small percentage increases that repeat over time. For example, an 18% annual interest rate on a loan might not sound too bad, but ten years later your debt will have grown not by

180% but by 523% – a potentially disastrous difference.

#### SOME PEOPLE SAY...

'Misleading sales tactics are theft, pure and simple.'

WHAT DO YOU THINK?

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### WORD WATCH

**£3.99** – This trick works because people take psychological shortcuts when comparing prices, focusing on the number of pounds rather than the number of

pennies. Even though we know we shouldn't, we often do.

**Make all the others look cheap** – Some restaurants use a reversed version of this trick: they make their most profitable wine the second cheapest on the wine list. No one orders the wine that really is cheapest, because they don't want to look stingy.

### **Old-fashioned economists**

– Humans, in old-fashioned economic theories, are sometimes treated as perfectly rational, self-interested actors. In fact, humans act irrationally and against their own interests all the time. The increasingly popular field of 'behavioural economics' emerged in order to address this problem.

### YOU DECIDE

**1.** You buy something for a price you can afford and are happy with. Then you discover the same item for sale much cheaper on the other side of town. Does it make sense to be annoyed?

**2.** The great Oscar Wilde once wrote: 'Nowadays people know the price of everything and the value of nothing.' Do you agree?

### ACTIVITIES

**1.** Two farmers are both selling apples at £10 for a sack of 60. One offers to knock 40% off the price. The other offers to give you 40% more apples for no extra charge. Whose apples are

cheaper, and by how much? You may need a calculator for this one.

**2.** In 100 words or less, write a philosophical definition of the term: 'a fair price.'

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 **NOTES**

