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Cracking the semantic code

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We make choices about pretty much everything, all the time – "Should I go for a walk or grab a coffee?"; "Shall I look at who just came in or continue to watch TV?" – and to do so we need something common as a basis to make the choice.

Dr John Fennell and Dr Roland Baddeley of Bristol's School of Experimental Psychology followed a hunch that the common quantity, often referred to simply as reward, was a representation of what could be gained, together with how risky and uncertain it is. They proposed that these dimensions would be a unique feature of all objects and be part of what those things mean to us.

Over 50 years ago, psychologist Charles Osgood developed an influential method, known as the 'semantic differential', that attempts to measure the connotative, emotional meaning of a word or concept. Osgood found that about 50 per cent of the variation in a large number of ratings that people made about words and concepts could be captured using just three summary dimensions: 'evaluation' (how nice or good the object is), 'potency' (how strong or powerful an object is) and 'activity' (whether the object is active, unpredictable or chaotic). So, half of a concept's meaning is simply a measure of how nice, strong, and active it is. The main problem is that, until now, no one knew why.

Dr Baddeley explained: "Over time, we keep a running tally of all the good and bad things associated with a particular object. Later, when faced with a decision, we can simply choose the option that in the past has been associated with more good things than bad. This dimension of

choice sounds very much like the 'evaluation' dimension of the semantic differential."

To test this, the researchers needed to estimate the number of good or bad things happening. At first sight, estimating this across a wide range of contexts and concepts seems impossible; someone would need to be observed throughout his or her lifetime and, for each of a large range of contexts and concepts, the number of times good and bad things happened recorded. Fortunately, a more practical solution is provided by the recent phenomenon of internet blogs, which describe aspects of people's lives and are also searchable. Sure enough, after analysing millions of blog entries, the researchers found that the evaluation dimension was a very good predictor of whether a particular word was found in blogs describing good situations or bad.

Interestingly, they also found that how frequently a word was used was also a good predictor of how much we like it. This is a well-known effect – the 'mere exposure effect' – and a mainstay of the multi-billion dollar advertising industry. When comparing two options we just choose the option we like the most – and we like it because in the past it has been associated with more good things.

Analysing the data showed that 'potency' was a very good predictor of the probability of bad situations being associated with a given object: it measured one kind of risk.

Dr Fennell said: "This kind of way of quantifying risk is called 'value at risk' in financial circles, and the perils of ignoring it have been plain to see. Russian Roulette may be, on average, associated with positive rewards, but the risks associated with it are not for everyone!"

It is not the only kind of risk, though. In many situations, 'activity' – that is, unpredictability, or more importantly uncontrollability – is a highly

relevant measure of risk: a knife in the hands of a highly trained sushi chef is probably safe, a knife in the hands of a drunk, erratic stranger is definitely not.

Dr Fennell continued: "Again, this different kind of risk is relevant in financial dealings and is often called volatility. It seems that the mistake that was made in the credit crunch was not ignoring this kind of risk, but to assume that you could perfectly guess it based on how unpredictable it had been in the past."

Thus, the researchers propose that half of meaning is simply a summary of how rewarding, and importantly, how much of two kinds of risk is associated with an object. Being sensitive not only to rewards, but also to risks, is so important to our survival, that it appears that its representation has become wrapped up in the very nature of the language we use to represent the world.

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