The serious fallout from information compression

It’s tempting to think that consumer ratings of the next item you buy online are a healthy guide to finding the best product, but the reality is different. The clustering of items rated 4.5 stars out of five may suggest a constellation of safer choices, but it is a false beacon, and has ramifications in an era when people increasingly make decisions from online information. A team of leading researchers in information systems and marketing has produced a theory about this phenomenon and discovered that, while the fallout of this for shoppers may just be a purchase that doesn’t work, the costs can be much more severe when ratings are applied elsewhere. What they’re proposing challenges some of the fundamental thinking among their peers.

For an organisation to operate properly it requires effective individual and group decision-making based on accurate information. The social and technical networks that collect, store, distribute, and analyse data for providing such information and knowledge are called information systems.

Professor Richard T Watson of the Terry College of Business at the University of Georgia, USA, is one of a number of researchers examining information systems who have noticed an intriguing anomaly – an increase in data, such as a stream of ratings, can actually reduce the quality of information. Working with colleague Professor Amrit Tiwana, and collaborator Professor Kirk Plangger of King’s Business School in London, and Professor Leyland Pitt of the Simon Fraser University in Vancouver, Watson has focused on how online publicly available ratings can group around a high mean, reducing differentiation.

Professor Richard T Watson of the University of Georgia, USA, and fellow researchers have identified and studied this phenomenon.

They have developed a theory of information compression, which challenges conventional thinking that more data means better information.

Information compression can have serious, organisational, and societal consequences.

Concern for the backlash of negative reviews encourages physicians to prescribe interventions their patients believed they need.

This phenomenon a name – information compression – and they provide some highly relevant examples of its negative social consequences. They theorise on its causes and effects.

Online reviews help consumers make purchasing decisions.

However, because some judgments can be costly, online ratings can group around a high mean, reducing differentiation.

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broader societal impact, such as the introduction of online review of physicians, influences the expected judgement costs of an agent (physician) concerned with preserving their reputation or income, which changes that agent’s behaviour (over prescription), ultimately resulting in a convergence of ratings, information compression, and a negative societal outcome (Figure 3).

The nature of online rating systems exacerbates this. They often lack context – evidenced in the typical star-rating system – and are subject to multiple biases, measurement errors, and the restrictions of summarisation, such as reporting only the mean of many ratings. The outcome is known as a ‘positivity preference’, and amplifies this ‘compression’ around high scores. According to the researchers, this effect can be measured as a compression index (CI) between 0 and 1 – the higher the value, the greater the compression – which they developed.

Another example of information compression for Watson and his team lies in the fallout from auditing firms also offering consulting services. Instead of information emerging, encouraged some financial services firms to pay less attention to lies in the fallout from auditing firms also offering consulting services. Another example of information compression for Watson and his team have shown that more isn’t necessarily better. A substantial £10 million fine imposed by the UK’s financial watchdog, the Financial Reporting Council, on PwC (an audit and professional services firm) in 2018 exposed this practice when it highlighted that a recent audit failed to detect a major firm’s subsequent failure.

The other costs of information compression
Watson and his team’s theory of information compression should encourage urgent and serious consideration by other researchers in information systems. The field has implicitly assumed that the proliferation of data from online ratings provides valuable research information and guides better consumer decision-making. Watson and his team have shown that the opposite could be true: more is not necessarily better. Key professions concerned with reputational preservation are increasingly at the mercy of anonymous online ratings. Furthermore, social media can amplify judgement costs; these costs can be more than reputational – they can also be financial, psychological, opportunity, and privacy costs.

The theory of information compression implies that justificatory reasoning – exemplified by the scientific method, where facts and data support decision-making – may no longer have a place within information systems that pander to anonymous popular sentiment, and that when such sentiment determines the cost of judgements, moral codes can be compromised.

Watson and colleagues have developed a theory of information compression, which challenges conventional thinking that more data is better information.