

'Big data' from online interactions offer a rich object of study for academics and policy-makers interested in human nature and economic behaviour

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*Data on the interactions between individuals on the Internet are often viewed as a potential threat to privacy or freedom of expression, particularly in the aftermath of Edward Snowden's disclosures on the surveillance activities conducted by the United States' National Security Agency (NSA). As **Wojtek Przepiorka** writes, however, the 'big data' produced by online transactions on websites such as eBay can also be an invaluable resource for academics and policy-makers. He argues that subjecting this data to formal study has the potential to uncover key insights on human nature and economic behaviour.*



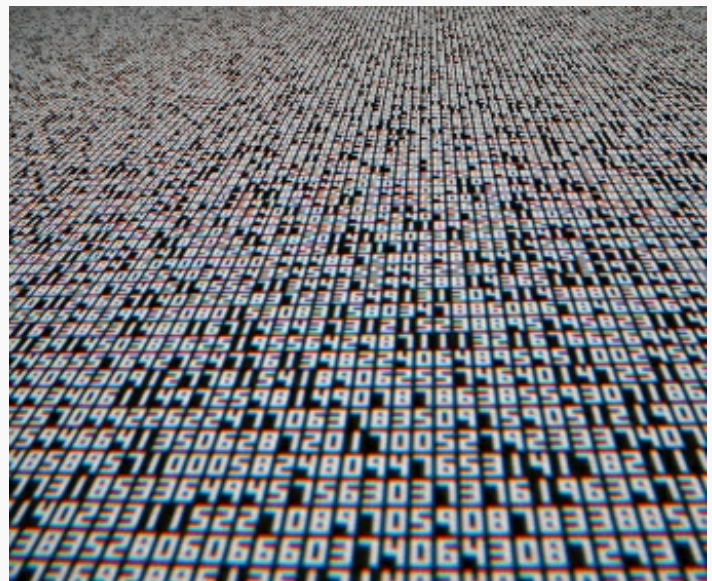
More and more social interactions are taking place online. The Internet opens up virtually endless opportunities to communicate with people all over the world, to buy and sell goods, or to find partners for business, leisure and life. All these actions and interactions produce data, 'big data': for some an invaluable asset, for others big brother's fuel.

Social and behavioural scientists too have become enthused by big data, but it seems that the mere size of it has been driving the hype while big questions are largely – but not entirely – lacking. **One of the largest attempts** to tap big data for social science research, for instance, was led by the following question: In as much as we are a cooperative species, how can we use information and communication technology to foster our cooperative traits to the benefit of all?

Interestingly, online peer-to-peer (P2P) markets such as eBay, have been convincingly answering this question for almost two decades. In online markets, tens of thousands of anonymous buyers and sellers trade with each other every day, often across large geographic distances transcending national borders. P2P trading occasionally requires buyers to send hundreds of euros to a complete stranger at the other end of the world. But these buyers do not have to be gullible to expect the merchandise in return for their payment. The rating system implemented in online markets gives sellers a strong incentive to reciprocate buyers' payments, while a negative rating by an unsatisfied buyer may seriously hamper their future business.

It has been shown repeatedly in numerous studies that positive ratings increase sales and prices, while negative ratings have a negative effect on sellers' online business. Of course, we already knew that reputation matters before the advent of the Internet. What is new, however, is the scale at which information about individuals' deeds and misdeeds is made publically available.

Obviously, this requires a mechanism through which such information can be collected and disseminated and in the



Big data, Credit: Jean-Pierre Dalbéra (CC-BY-SA-3.0)

case of online trade this is exactly what online market platforms provide. What they do not do, however, is feed information into the feedback system. The decision to leave feedback after completing a transaction is left to the discretion of each trader, and herein lies the problem, or rather, the puzzle.

The mystery of P2P feedback

In most studies on online P2P trading, feedback rates are reported to be above 50 per cent with some even reaching 80 per cent and more. That is, a majority of finished transactions is rated by at least one of the traders and very often by both. At the same time, it is estimated that the same buyer and seller are unlikely to meet each other again; [one study](#) shows that more than 95 per cent of interactions between two online traders are one-off encounters.

Thus, the question arises why so many traders bother to comment on each other's conduct if giving this information has no direct benefit for them. The fact that they do is crucial for the functioning of online markets as it is mainly by traders' feedback that potentially fraudulent traders are detected or deterred from entering the market in the first place.

The question why traders voluntarily contribute to the public health of an online reputation system is difficult to answer with data gathered from the Internet. Usually, process data mirrors traders' actions only, and actions leading to similar patterns in the data could result from these traders' different motives. Therefore, it is important to have a theory or two to be able to make conjectures about what one can expect to find in a statistical analysis. Based on such a theory driven analysis of hundreds of thousands of rating events, it has [been shown](#) that reciprocity and altruism, but also strategic motives, are important drivers of online P2P traders leaving feedback after completed transactions.

First, many online traders are willing to incur a cost to respond to good behaviour with a reward and to bad behaviour with punishment. Such reciprocal motives are consistent with the finding that a trader's willingness to give feedback increases markedly if their trading partner leaves feedback first.

Second, many traders seem to care about the impact of their ratings on the reputation of their trading partner. For instance, traders are more likely to give a positive rating and they are more reluctant to give a negative rating to a trading partner with fewer ratings, who is still in the process of building a reputation. Finally, there is evidence for strategic motives. Some traders postpone giving negative ratings because they fear to be rated negatively in return. However, strategic motives for giving feedback have proved difficult to identify in the data.

Big data experiments

Although some open questions remain, these findings show how the institutional set-up of an online market can engage traders' moral sentiments and material interests to create favourable conditions for mutually beneficial trade. On the one hand, traders are aware of and care about the monetary value a good online reputation has. On the other hand, most traders do not spare the costs of leaving feedback after completed transactions, and many do so out of altruistic motives. However, because process data as such is silent about the motives underlying the behaviour that produces it, these findings need to be complemented with other research approaches such as laboratory and field experiments.

Computerised laboratory experiments are very well suited to disentangling different motives behind the actions of individuals. In laboratory experiments, researchers can approximate the conditions that, for instance, traders face in an online market and record the behavioural changes that result from a systematic variation of these conditions. In fact, the adjustment in eBay's reputation system in spring 2008 was guided by a [thorough theory driven analysis](#) of process data from online markets and data from laboratory experiments.

Moreover, given that more and more social interactions and everyday decision making are taking place online, the opportunity to conduct online field experiments has never been greater. In field experiments, researchers deliberately change properties of the online environment to study the effects these changes have on people's

behaviour. Insights from field experiments too can be used to recommend adjustments in the functioning of an online platform, preferably to the benefit of the users.

In any case, there is a lot more to learn from the piles of data that are generated every day than how to make more money. Commercial online platform providers and administrations should be open to the creativity of social and behavioural scientists and their ambition to learn more about human nature and sociality without losing their integrity as independent researchers.

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