

Online food reviews reveal inner self, Stanford linguist finds

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(Phys.org) —Word choice in online restaurant reviews reveals much about people's inner worlds, according to Stanford research. The study, appearing in the April 7 issue of the journal *First Monday*, uses software to investigate almost 900,000 reviews of 6,548 restaurants – from fast food to luxury restaurants – on Yelp.com.

Dan Jurafsky, a Stanford professor of linguistics and one of the co-authors, said, "Our goal was to examine online reviews not for what they tell us about [restaurants](#), but rather for what they tell us about people, about the psychology of the person who wrote the review. We studied the meanings that are hidden in the way people use words and connotations."

The reviews covered restaurants in Boston, Chicago, Los Angeles, New York, Philadelphia, San Francisco and Washington, D.C. The researchers used techniques from computational linguistics and "sentiment analysis" to measure characteristics of review language – the number of words, the use of specific pronouns or the number of times words appear from specialized lexicons.

For example, to measure negative emotions in reviews, the researchers used a linguistic list of 500 words and word stems that included "fail," "disappoint," "bad," "antagonize" and "heartbreakingly."

The researchers made several discoveries:

- Positive reviews of expensive restaurants tended to use metaphors of sex and sensual pleasure, such as "orgasmic pastry" or "seductively seared foie gras." And the words used in those reviews were longer and fancier.
- Positive reviews of cheap restaurants and foods often employed metaphors of drugs or addiction – "these cupcakes are like crack."
- Negative reviews were frequently associated with the language of personal trauma and poor [customer service](#): "We waited 10 min. before we even got her attention to order."
- Women were more likely than men to use drug metaphors to describe their attitudes toward food.
- The foods most likely to be described using drug metaphors were pizza, burgers, sweets and sushi.

'Sense of self'

For Jurafsky, the most surprising finding was how strongly the language of negative Yelp reviews resembled the language of people who have been traumatized by tragedies or the deaths of loved ones.

"Bad reviews," he said, "seem to be caused by bad customer service rather than just bad food or atmosphere. The bottom line is that it's all about the personal interactions. When people are rude or mean to you, it goes straight to your sense of self."

The negative reviews function as a means of coping with service-related trauma, according to the study.

Sensuality counts

Overall, the positive reviews reflect a more buoyant or fun-loving self in search of pleasure. But reviews of expensive restaurants differed sharply from reviews of cheaper restaurants. Reviews of costly restaurants used metaphors of sexuality and sensuality, talking about "jaw-droppingly good sexy food" and "orgasmic" pastry, according to the study.

Jurafsky said that reviews of expensive restaurants also relied on "complex words and wordy reviews" to craft the image of the reviewer as well educated or sophisticated, using words like "sumptuous," "commensurate," "unobtrusively" and "vestibule."

In contrast, the positive reviews for cheaper restaurants radiated the drug and addiction metaphors, the study found. Examples include "be warned the wings are addicting" and "the garlic noodles should be outlawed! They are now my drug of choice."

"Positive reviews appeal, presumably light-heartedly, to the author as an addict suffering from cravings for junk foods, non-normative meals and other guilty pleasures," the researchers wrote.

Why the difference between addiction metaphors and sensual imagery? Foods that are "craved" like a drug are typically meaty, sugary, starchy, snacks or fast foods. "Craved foods aren't vegetables," wrote the researchers.

"We talk about food as an addiction when we're feeling guilty about what we're eating," said Jurafsky.

As for meals at fancier establishments, the reviewers adopted the language of higher socioeconomic classes.

By using [metaphors](#) of sexuality and sensuality in these long reviews, the reviewers further portray themselves as food lovers attuned to the sensual and hedonic element of cuisine, the report found.

Whether the restaurant was expensive or not, reviewers were sensitive about how they portrayed themselves.

"Across multiple variables, online review narratives reveal the reviewers' concern with face and the presentation of self," the researchers wrote.

As for gender differences, Jurafsky noted that prior research shows women are more likely to express cravings for foods like chocolate than men, and that they might be more comfortable expressing these feelings. However, he stresses that more research is necessary to understand what may be underlying the differences they found.

Mining for 'mindsets'

Jurafsky said the findings pose implications for the restaurant industry. The fact that many [negative reviews](#) highlight "service-related traumas" may encourage restaurant managers to prioritize customer satisfaction if they are not doing so already.

The research, Jurafsky said, offers an important new direction in the behavioral sciences; online [reviews](#) are a valuable source of insight into humanity in the Internet age.

"When you write a review on the web you're providing a window into your own psyche – and the vast amount of text on the web means that researchers have millions of pieces of data about people's mindsets," said Jurafsky, whose co-authors include Victor Chahuneau, Bryan Routledge and Noah Smith, all from Carnegie Mellon University.

More information: JURAFSKY, Dan et al.

"Narrative framing of consumer sentiment in online restaurant reviews." *First Monday*, [S.I.], Mar. 2014. ISSN 13960466. 2014. [DOI: 10.5210/fm.v19i4.4944](https://doi.org/10.5210/fm.v19i4.4944)

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