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## Languages Lose Vocab to Science and Spell-Check

Francie Diep, InnovationNewsDaily Staff Writer

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Shakespeare has been credited with [inventing thousands of words](#) that are still in use today —a claim [some dispute](#), but at the very least, he spelled his name a few different ways in his lifetime, including "Shakespere" and "Shakespear." The spelling of English words just wasn't as standardized during Elizabethan times. But would [Shakespeare's](#) famous wordplay hold up today? Probably not, according to a new study, which claims that the rate of the invention of new words is lower than it's ever been, because of the rise of science and spell-check. The [study was published March 15](#) in the journal Scientific Reports.

An international team of physicists mathematically analyzed 10 million English, Spanish and Hebrew words that appeared in [books that have been digitized](#) by Google and which were originally published between 1800 and 2008. "The data was so rich that it really allowed us to look at the growth trajectory of the words from the moment they were born," said one of the researchers, Alexander Petersen from the IMT Lucca Institute for [Advanced Studies](#) in Italy. The birth of a word, in this study, meant the first time it appeared in literature.

They weren't just tracking new words, however, but also the alternate spellings of which Shakespeare/Shakespear/Shakespere was so fond. Petersen and his colleagues counted alternate spellings of the same word, such as "color" and "colour," as two different words, so they could see how alternate spellings fare in a language over time. Then they used equations to analyze how often words showed up in literature.



Is this a radiogram, Roentgenogram or an X-ray?

The way modern science papers are published has pushed out synonyms for x-rays over the past 100 years.

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The members of the research team normally study how physics equations can apply to companies competing in markets, so they studied the rise and fall of words in the same way. "The evolution of language is governed simply by individual words competing for usage just as companies compete for market share," said Joel Tenenbaum, another one of the researchers and a doctoral student at Boston University.

The comparison is an apt one, said Anthony Aristar, a linguistics professor at Eastern Michigan University who was not involved in the study. "No one bothers to try to interfere with how language functions," Aristar told InnovationNewsDaily. Unperturbed, words in language fall under pressures that are similar to "pure market forces," he said.

The physicists found that after 1950, words started dying more frequently and fewer new words were born than earlier in their study period. Even though newly-invented [technology](#) creates new words – such as "antibiotic" – overall, the increasing strictness of editing at publishing houses and automatic spell-check have reduced new words over the past 60 years by reducing alternate spellings, they found. People can also talk to each other so much more easily now, Tenenbaum told InnovationNewsDaily. So they see how others spell and choose the same spellings.

Science can encourage the paring away of synonyms, too, the physicists discovered. As one example, they tracked words for X-rays. From 1900 to 1980, "Roentgenogram," which was named after [X-ray discoverer Wilhelm Conrad Röntgen](#), was the most common word for X-ray images. Now, of course, "Roentgenogram" is virtually extinct and most people can't even think of a synonym for "X-ray." Two trends probably contributed to the death of "Roentgenogram," the researchers wrote: People's bias for shorter words and the rise of English as the language scientists prefer to use to publish papers (Röntgen is a German name).

Linguistics research has also found that languages are more standardized now than they ever have been before, Aristar said.

Of course, English has changed since Shakespeare's time, but it's not just about the words. A certain flexibility and messiness that the bard worked with is vanishing. Science, spell-check and worldwide communication have made languages cleaner and more regular. But we're at the "endgame" of standardization, Tenenbaum thinks. "I don't know how much more you could really standardize language from here," he said.

From now on, the new words of the future will refer to new products or ideas, Tenenbaum and his colleagues think. We may have reached an end of variations and synonyms, but we're ready for a totally new vocabulary.

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