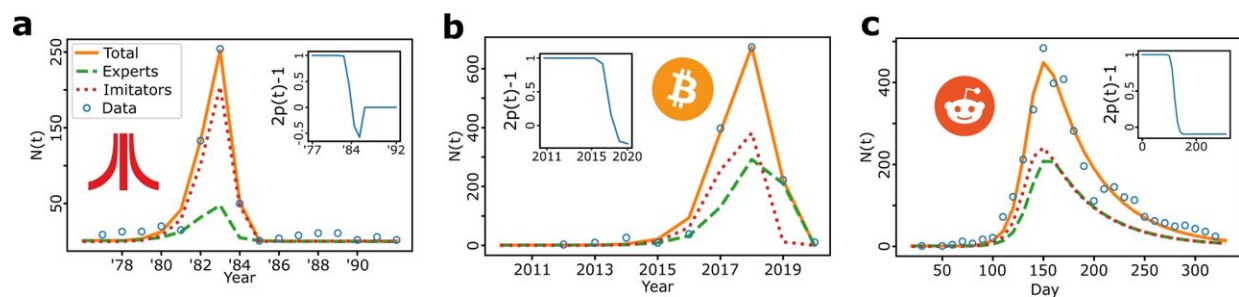# New study shows trendy technologies eventually outgrow the supply of experts and crash in popularity

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Modeling the boom-and-bust pattern of cultural productivity. For a) Atari 2600 video games, b) cryptocurrencies, and c) Reddit posts, we show the temporal dynamics predicted by the population-based model. We show the real cultural productivity, $N(t) = x(t) + y(t)$, during that period (open blue circles), the predicted cultural productivity (orange solid line) and the population of experts $x(t)$ and imitators $y(t)$ at any given time t (green and red dashed lines, respectively). As an inset for each case, we report the expected population growth $(2p(t) - 1)$ due to product novelty $p(t)$ in that period. Credit: *Humanities and Social Sciences Communications* (2022). DOI: 10.1057/s41599-022-01380-5

When office-job workers at home during the pandemic turned to day trading with cryptocurrencies and word spread of easy money, the market exploded. In May 2022, however, it collapsed—spectacularly.

What causes new trends to come crashing down is the subject of a new

research study published in *Humanities and Social Sciences Communications*. Using examples from Atari games of the '80s to cryptocurrencies of today, researchers show trendy technologies often take off and spread widely. At a certain point, however, they outgrow the supply of experts instrumental to the innovation. Quality of the product drops off and they crash in popularity.

"We believe this is due to 'dilution of expertise,' as copycats abound," said Alex Bentley, professor of anthropology at the University of Tennessee, Knoxville, and co-author of the study. "As Yogi Berra said, 'No one goes there anymore; it's too crowded.'"

In the study, researchers focused on data from explosive trends from different decades—early personal computers and home consoles, Reddit posts, and cryptocurrencies. They applied computational techniques to the data to measure how much new information was being added through time into each growing trend and the complexity of the information.

The study showed that as each trend accelerated, the products became more and more redundant or over-copied, which decreased their levels of new information and complexity.

"A good example is the way a story on social media, like Reddit, gets more and more stale as it is endlessly copied with little freshness added," said Bentley.

The team speculates that the "dilution of expertise" is a widespread pattern, even in historical and ancient times.

"We think the model is widely applicable," said Salva Duran-Nebreda, researcher with the Institute of Evolutionary Biology in Barcelona lead author. "Expert communities are, by definition, small compared to the

mainstream."

At first, there is a small number of inventors who share expert knowledge in their specialization as well as keen interest and creativity. If their invention takes off as a trend, however, the balance of creative expertise that the experts can provide becomes overwhelmed by the rising numbers of imitators, who spread the innovation but rarely contribute to it knowledgeably or creatively. A crash is inevitable when the popular trend has outgrown its population of subject experts.

"In each case, the imitation of new ideas comes to outpace the capacity of the expert community to keep it fresh and moving forward," said Sergi Valverde, researcher with the Institute of Evolutionary Biology in Barcelona and co-author.

The researchers intend to build on their findings, hoping that their model can be extended to develop an automatic monitoring system for detecting excess imitation, and hopefully, avoiding the negative consequences of expertise dilution.

Provided by University of Tennessee at Knoxville

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