Long-distance collaboration makes scientific breakthroughs more likely

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In an analysis of data for more than ten million research teams, across eleven academic fields from 1961 to 2020, a new working paper from the Oxford Martin Program on the Future of Work has determined that over the past decade remote collaboration between academic teams has led to more scientific breakthroughs. This is a reversal of what was

observed from the 1960s to the 2000s, when remote collaboration led to fewer scientific breakthroughs and more incremental innovation.

At first this might seem to contradict the established understanding that face-to-face and serendipitous interactions spark creativity and new discoveries. However, researchers think that remote collaborations are complementary and additive to working in-person.

Dr. Carl Benedikt Frey, Director of the Oxford Martin Program on the Future of Work said, "What we think we are seeing here is the impact of cross-pollinating ideas across different institutions and cities. When remote collaborations happen, individual academics still discuss their ideas within their knowledge networks at their institution. That means we might be seeing a multiplying effect of serendipitous encounters and complementary skills of multiple individuals from different institutions sparking breakthroughs across remote teams."

This research comes against the background of disruptive ideas and scientific breakthroughs becoming increasingly rare and harder to find, with incremental discovery now more common than groundbreaking new findings.

Yet the research could indicate change in the near future. New teams tend to create more disruptive science than existing teams, and academics with access to better digital infrastructure see better results from remote collaborations. As broadband internet access continues to expand, and more researchers and institutions can harness the new benefits of remote collaboration in the digital age, we may see this change.

"We could be at the start of a new J-curve of research productivity," continues Frey. "Looking at the historical record we see that steam and electricity led to delayed productivity gains between their introduction

and the time it took to improve and learn how to use them efficiently. It is possible we will see science and innovation at the start of the 21st century mirroring the start of the 20th as the benefits of digital collaboration tools enable researchers to think and work differently."

"As we are learning to succeed with remote work—minimizing its drawbacks while maximizing its benefits—not just in day-to-day operations, but also in science and innovation, productivity seems set to surge."

More information: Disrupting Science: www.oxfordmartin.ox.ac.uk/publ … /disrupting-science/

Provided by University of Oxford

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