



A Causal Test of the Strength of Weak Ties

Karthik Rajkumar
LinkedIn Applied Research

November 2022

What kinds of social networks matter for job mobility?

Rajkumar et al. (2022), published in *Science Magazine*

Co-authors: Guillaume Saint-Jacques (ex-LinkedIn),
Iavor Bojinov (HBS), Erik Brynjolfsson (Stanford), Sinan Aral (MIT)



Agenda

- 1** Why study this question?
- 2** Methodology
- 3** What networks matter for job mobility?
- 4** Implications for the labor market



1. Why study this question?

LinkedIn's vision

To create economic opportunity for every member of the global workforce.

Closing the Network Gap

- We believe that two people with equal talent should have equal access to opportunity.
- *Regardless* of your background, industry, or role.
- Programs like Reach, to train and hire talent from non-traditional backgrounds for careers in engineering, recruiting, and sales.

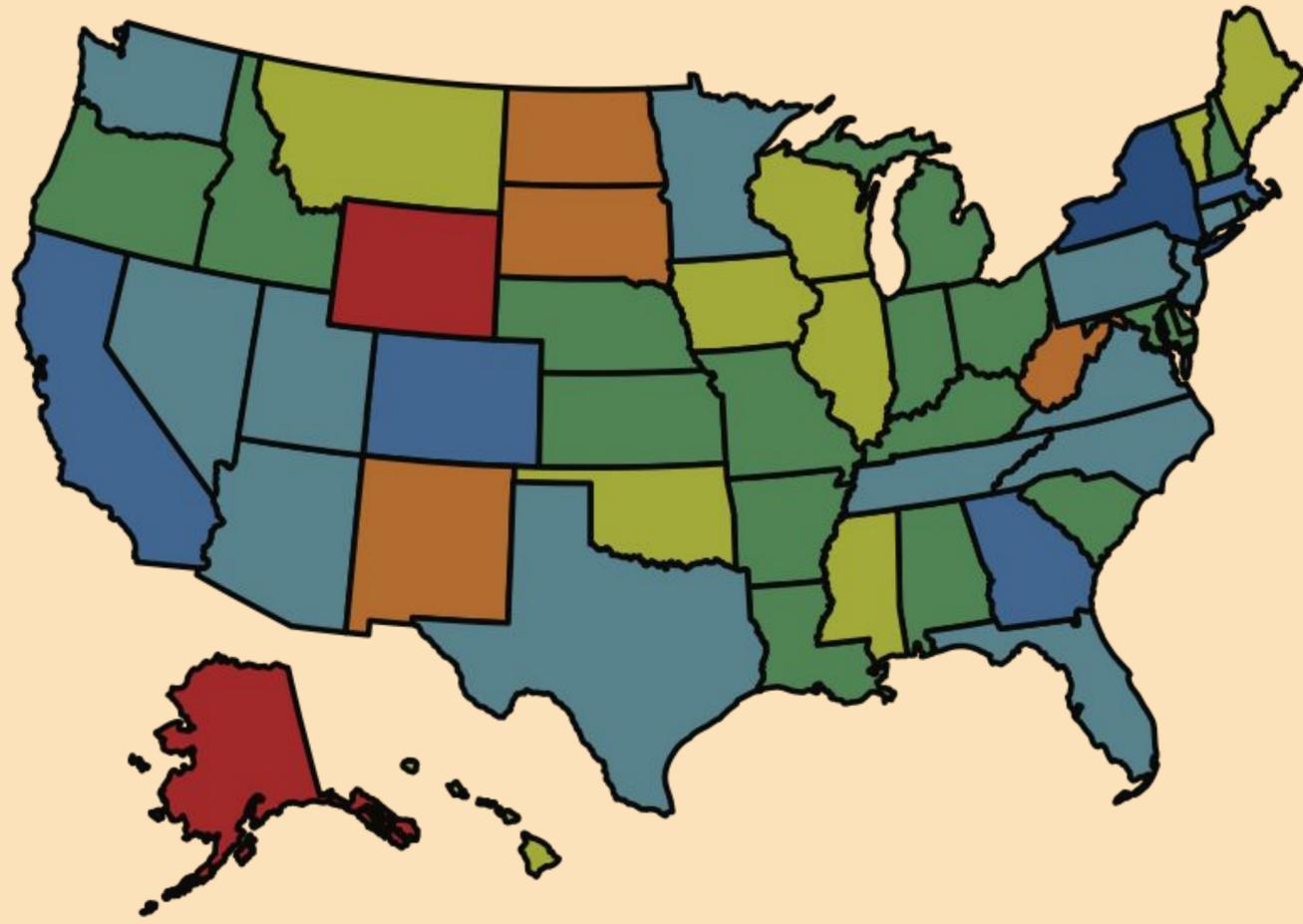
Project Every Member

- Analyses every new feature to determine if it is increasing or decreasing inequality between our members.
- Produces several inequality or equality statistics for every A/B test.
- Discusses results with product owners to shine light on the mechanism and tracks final product decisions.

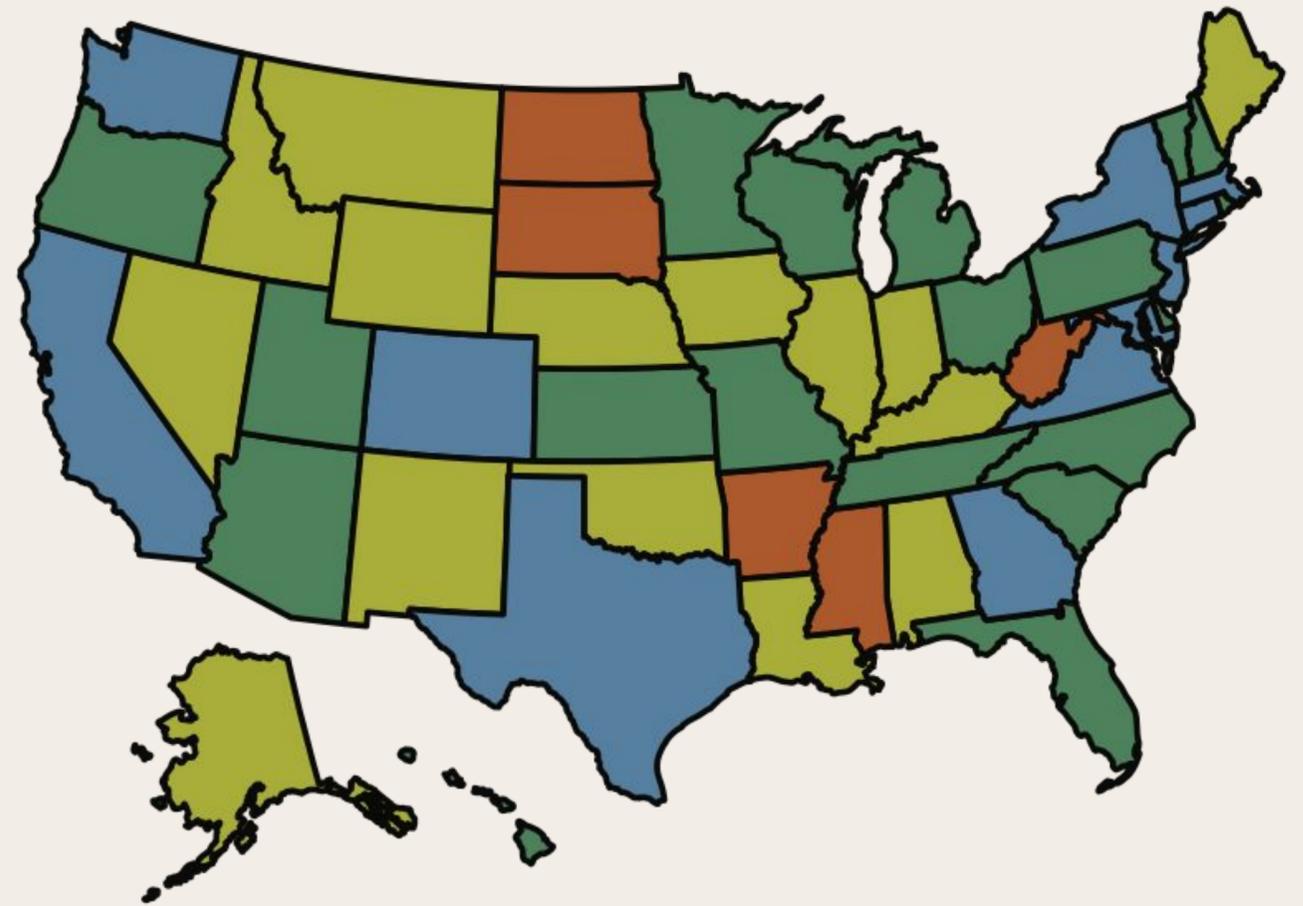


2. Methodology

There are many confounders for networks



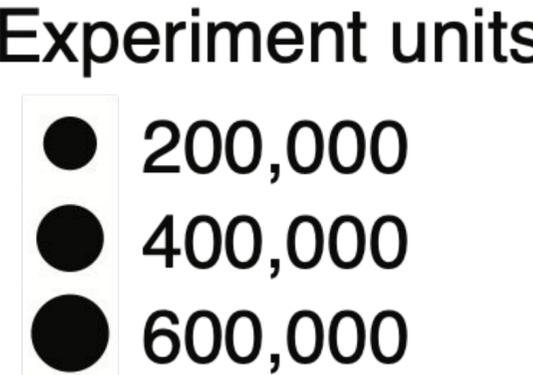
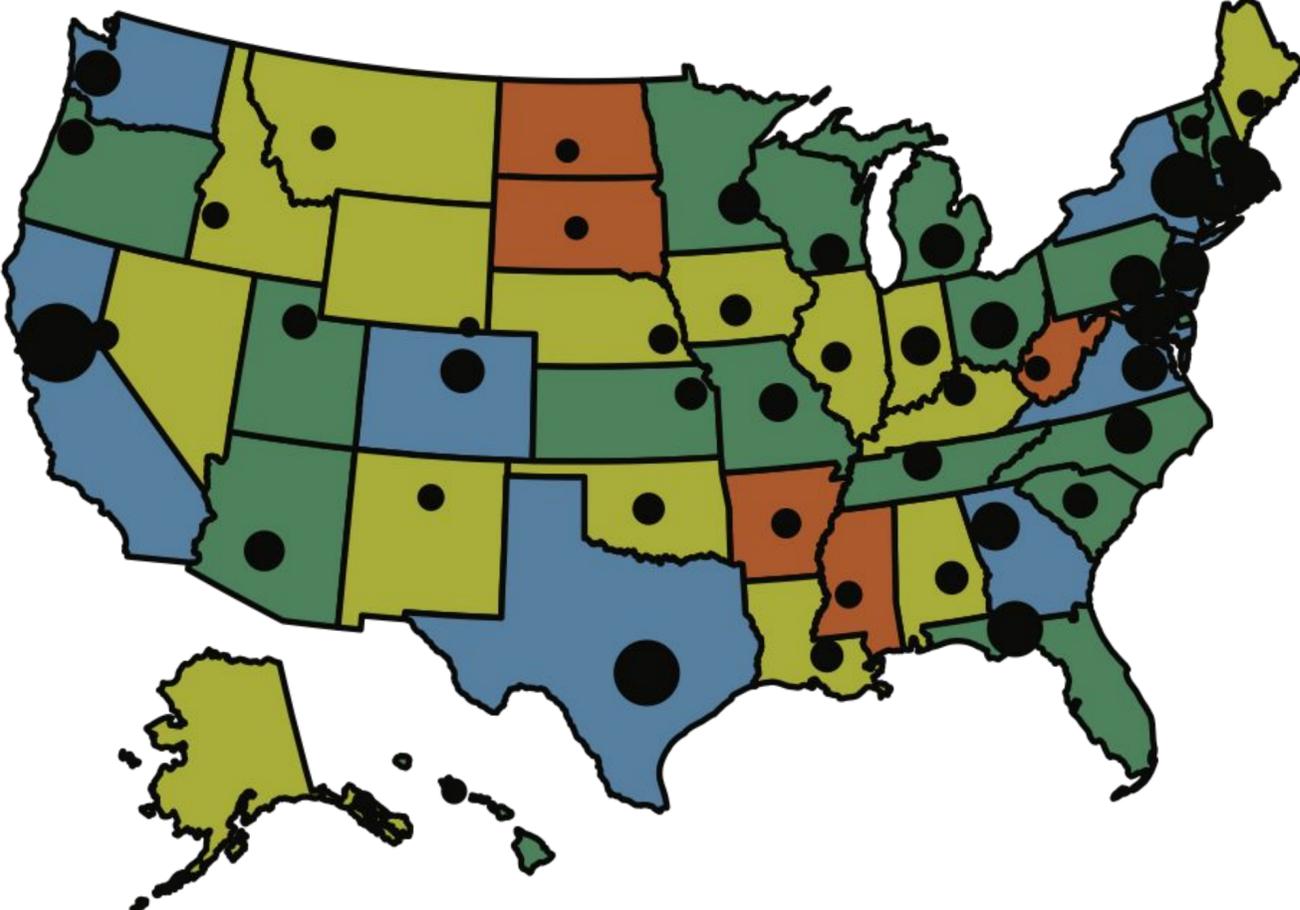
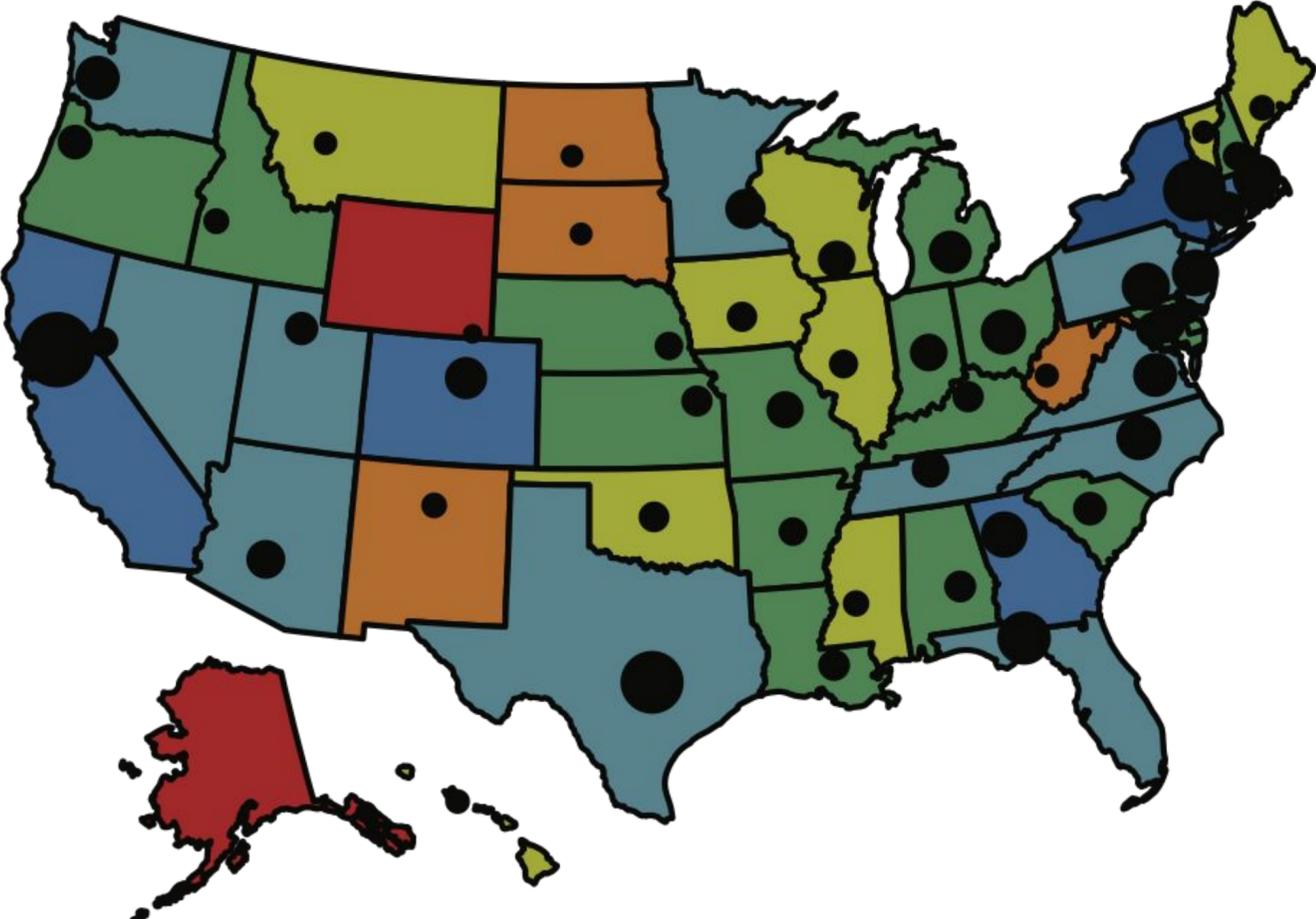
Average degree



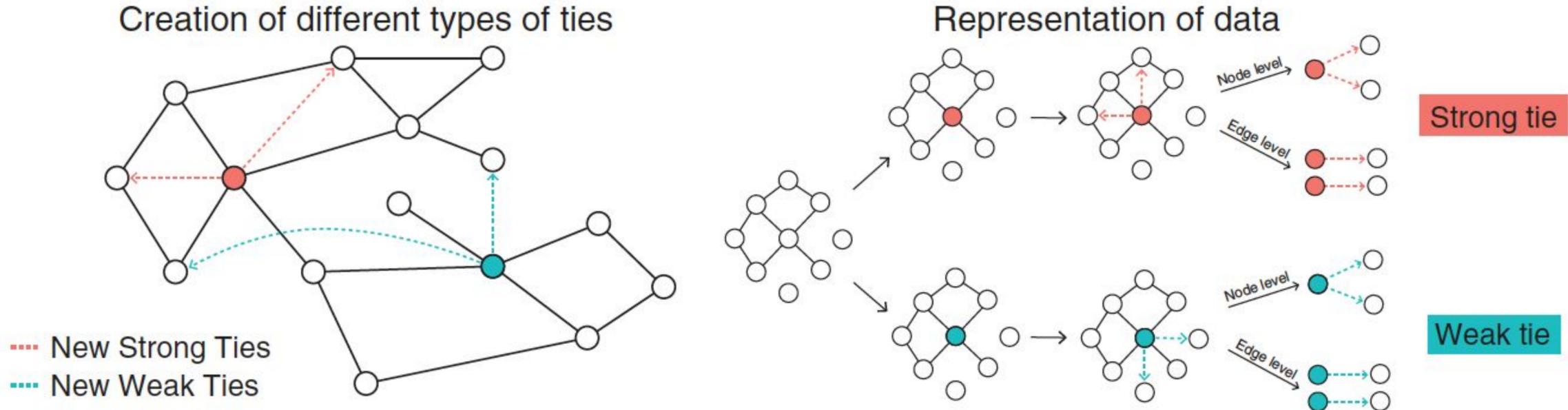
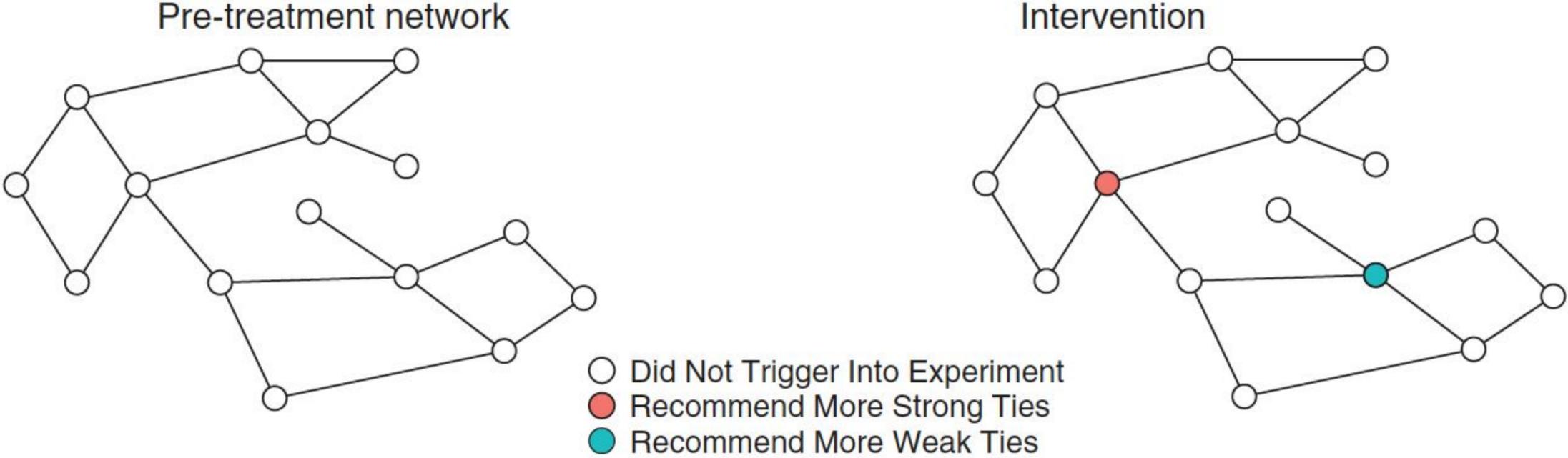
Average diversity



That is why we need causality!



Tests on the People-You-May-Know product



PYMK data stats

The first large-scale causal study of its kind



2015
through
2019

A/B tests that vary
connection recs



2 billion
new ties

Changes in the
composition of
member networks



600,000
new jobs

Which in turn
affect job applies
and mobility

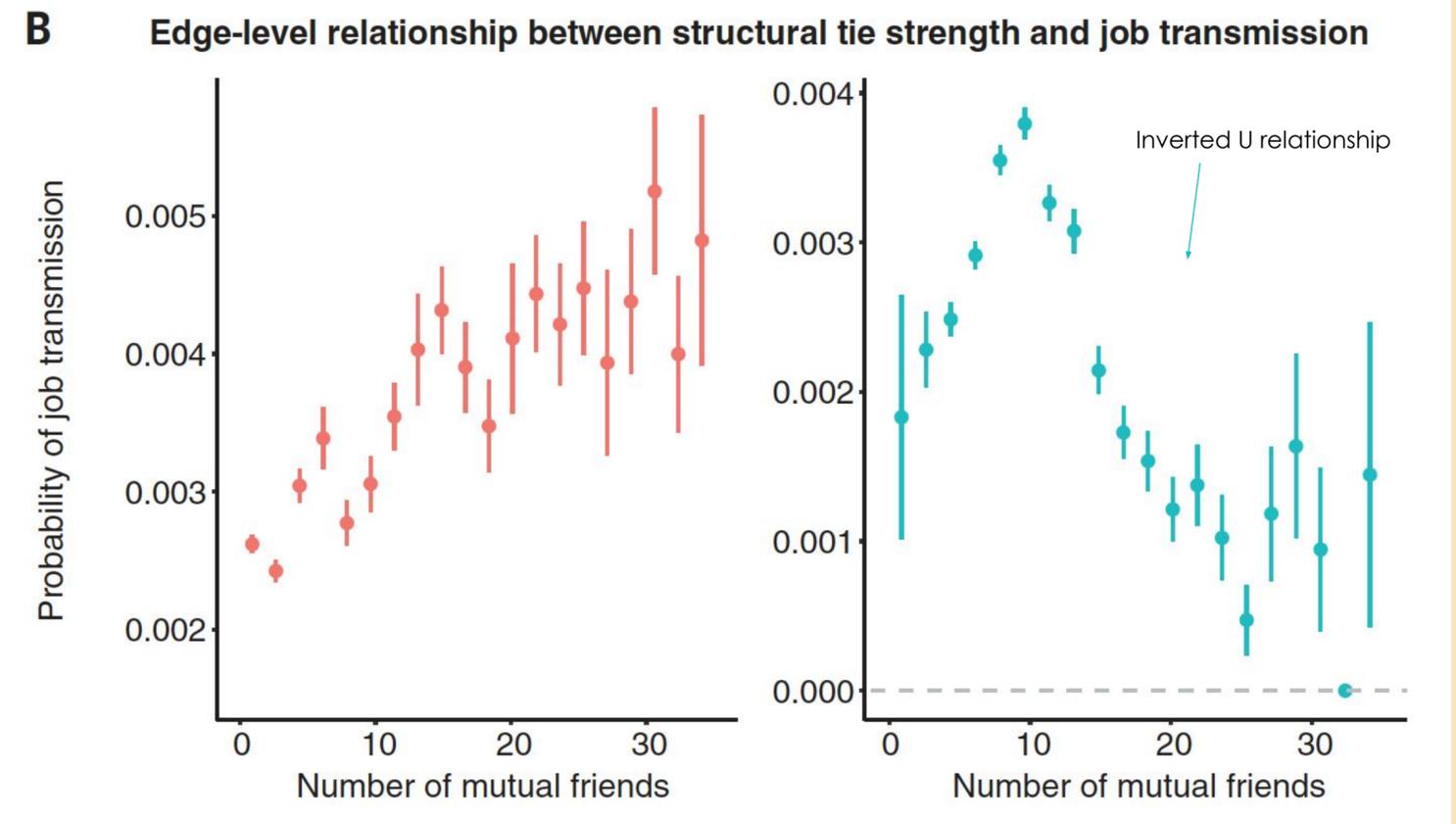


3. What networks matter for job mobility?

What kinds of networks matter?

With an observational study design, find that weak ties are better for job mobility

- Our PYMK results show that weak ties are causally better for job mobility.
- Tradeoff between someone being a source of novel information and being close enough to help a job seeker out.

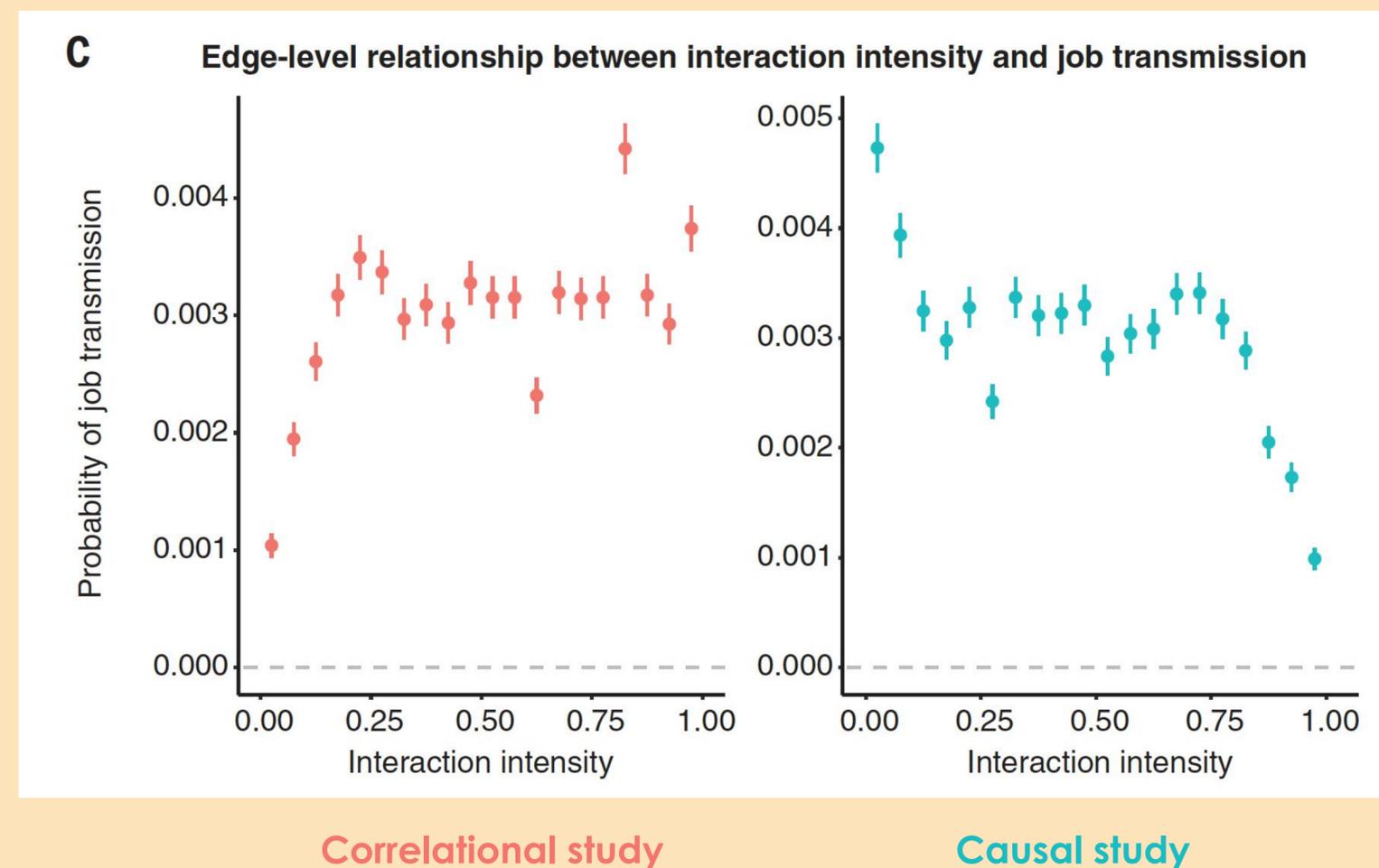


Correlational study

Causal study

Weak tie advantage generalizes across different measures

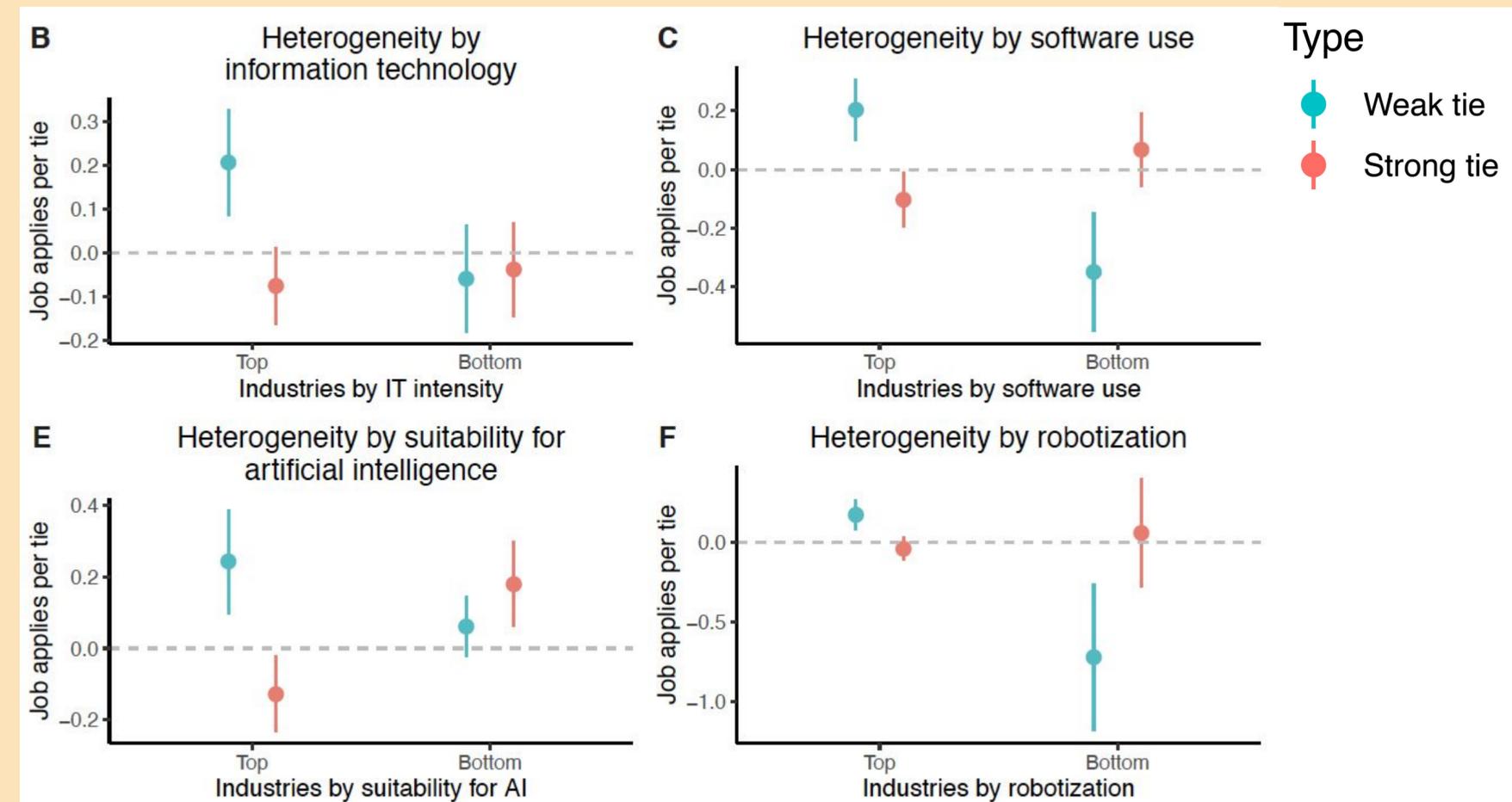
- We also used interaction intensity (a normalized measure of the number of messages two members exchanged) as a measure of tie strength.
- Here too we find that a causal study reveals the importance of weak ties, reversing what might be inferred from a purely correlational analysis.
- A third tie strength measure was the relative number of mutual connections, which again showed the weak tie premium.



Weak ties and innovation

Weak tie advantage best for workers in IT-heavy industries

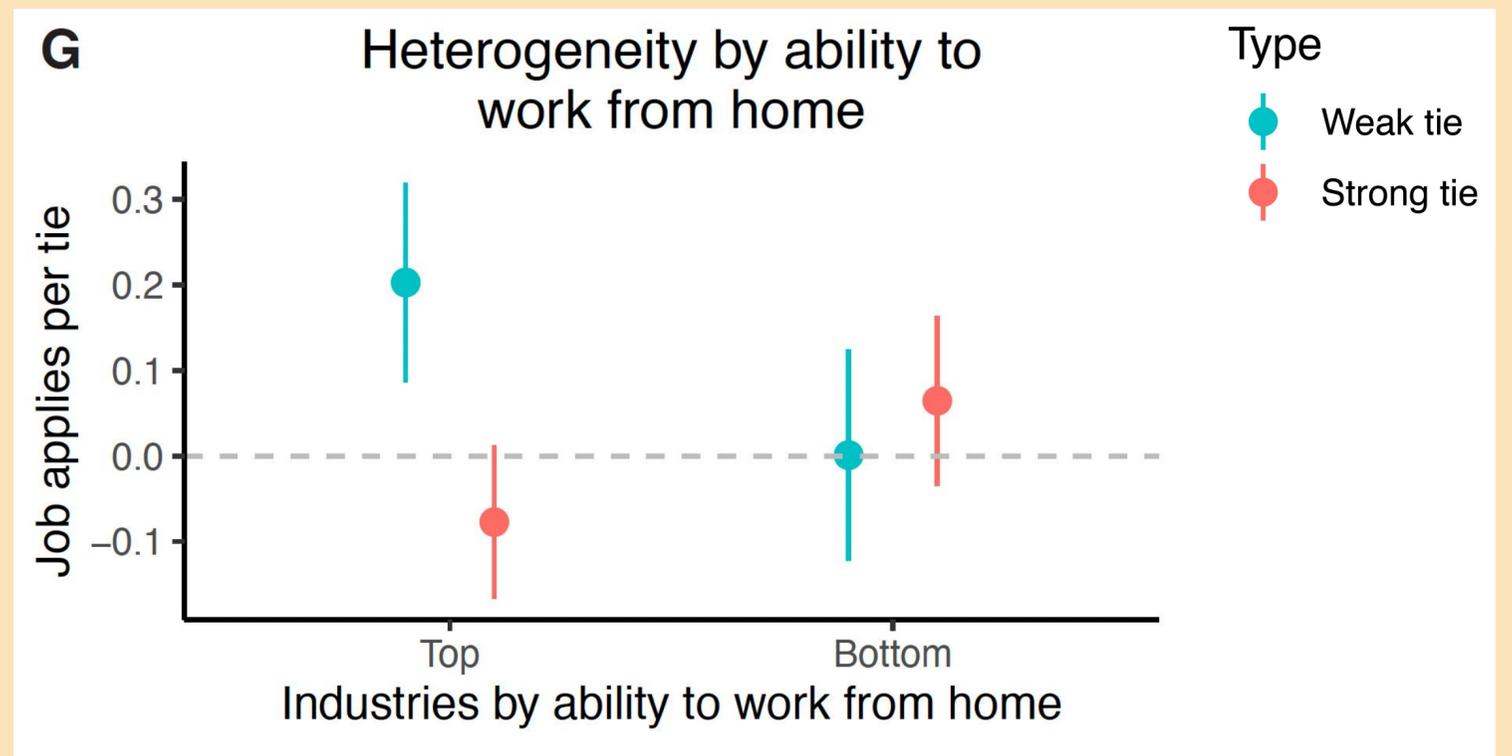
- Looking at job apply rates by member network compositions across industries.
- Those with more weak ties discover and apply to more jobs in industries that have more digitization, across a range of measures.
- Industries with the fastest pace of innovation and are typically invested heavily in digitization.



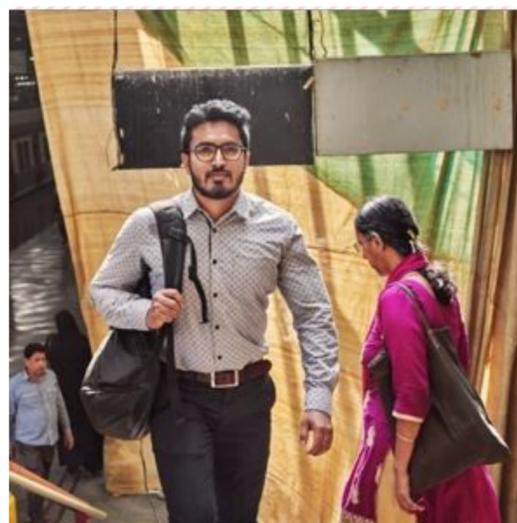
Weak ties and remote work

Weak tie advantage in remote work friendly industries

- Workers in industries that are remote work friendly discover and apply to more jobs.
- IT-heavy industries, including tech, are generally also remote work-friendly.
- Innovation requires weak ties, but remote work can make it hard to form them!



4. Implications for the labor market



Weak ties are important.

Our work at LinkedIn shows they play an important role in job mobility.

- Weak ties enable job seekers to discover more jobs.
- They likely serve as a conduit for information in fast-moving fields.
- Job seekers should lean into their weak ties and second-degree connections.

Remote work negatively affects weak ties

Workers make and maintain fewer weak ties during remote work.

- Work conducted by Microsoft demonstrates this on employee data from the early months of the pandemic.
- Our work shows the weak tie premium (for job mobility) is particularly high for these remote workable jobs.
- There is a sense that strong ties are great for “execution” work and weak ties for “ideation” work.

Put together, we have reason to expect lower innovation, productivity and mobility on average from the remote work revolution.

While hybrid work may lessen some of the negative effects of fully remote work, it is imperative that employers have a strategy to enable serendipity in today's workplace.

What does serendipity look like
at yours?

Read the paper:



Thank you