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Vision & Intelligence

EVIDENCE BRIEF
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EVIDENCE BRIEF · INNOVATION AND NETWORKS

Weak Ties Spread Ideas, Strong Ties Disrupt

Do weak ties produce breakthroughs?

Conferences and trade fairs are built to create weak ties, brief contacts between people who do not work together. Studies of 56,847 genetic-editing papers, 80,129 semiconductor patents, 440 Nobel laureates and 410,501 management articles show what weak and strong ties do for innovation, and where breakthroughs come from.

By Eventamin · How we work 12 November 2026 Worldwide, U.S.

●●●●● 5 studies

weak ties | strong ties | breakthrough innovation | disruptive research | collaboration networks | scientific collaboration | knowledge recombination | patent networks | Nobel laureates | networking at conferences

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KEY FINDING

Weak ties dominate collaboration and raise citation impact up to an arm's-length strength, but disruptive breakthroughs come mainly from strong ties and conventional knowledge combinations. In firms, collaboration across ranks produces more breakthroughs, while scientists tend to work with others of similar innovativeness, which narrows what they are exposed to.

Four studies, 2024–2026

Key findings

- **Weak ties dominate.** More than 85 percent of collaborative papers in genetic editing between 1950 and 2014 came from weak collaboration ties [1].
- **Arm's-length ties earn the most citations.** Citation impact peaked at moderate tie strength, below the midpoint, for both collaboration and knowledge combinations [1].
- **Strong ties disrupt.** Disruptive papers came mainly from strong collaboration ties and conventional knowledge combinations, and weak collaboration did not bring unusual combinations of ideas [1].
- **Mixing ranks drives breakthroughs.** Among 124 U.S. semiconductor firms, collaboration networks in which inventors of different standing worked together produced more breakthrough patents [2].
- **Scientists stick with their kind.** In management science, co-authors showed a strong tendency to match in innovativeness, with an index of 0.62, but the most influential scientists did not [3].

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FOR THE MARKET

Market outcomes

What the studies mean for each part of the industry.

Organisers & associations	Conferences generate the weak ties that spread ideas and raise visibility; formats that let attendees build stronger working relationships, such as recurring working groups, add the strong ties that disruptive work depends on.
Exhibitors & sponsors	Firms benefit from contacts outside their usual circles, but breakthroughs inside the firm come from mixing senior and junior inventors on the same projects.
Academia	Weak ties help papers get cited, but disruptive work comes from close collaboration; collaborating across groups and with people of different innovativeness widens what researchers are exposed to.

Weak ties and events

Trade fairs and conferences are designed to multiply weak ties. They work as temporary clusters where firms pick up the global buzz of their industry and keep professional networks alive[4]. Network theory holds that such weak ties bring new information, while strong ties bring trust and depth.

Large-scale studies of science and patents test whether weak ties produce breakthroughs.

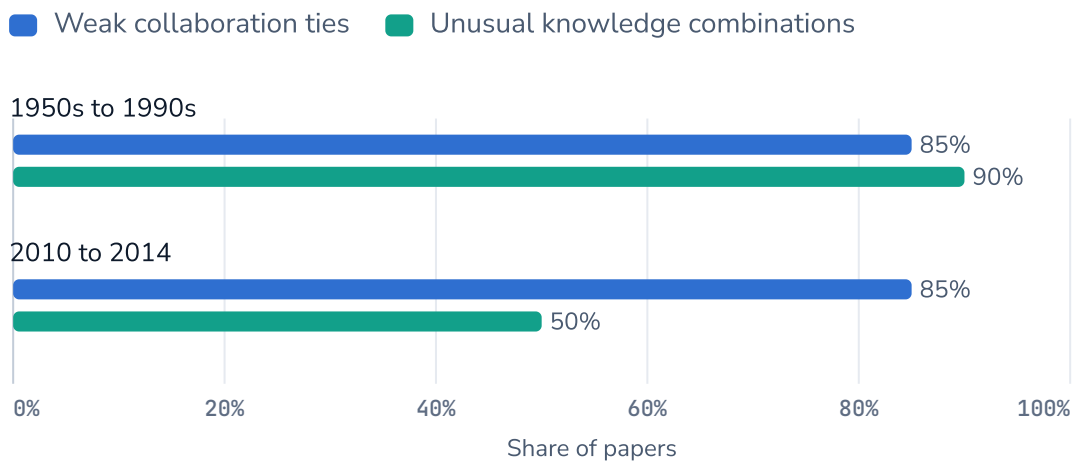
Weak ties dominate science

Most collaboration runs through weak ties. Among 56,847 papers in genetic editing between 1950 and 2014, more than 85 percent of collaborative papers came from weak collaboration ties[1]. Around 90 percent of papers also combined knowledge in unusual ways until the 1990s, but that share fell to around 50 percent by 2010 to 2014 as the field matured[1].

Weak collaboration and unusual ideas are not the same thing. Collaboration tie strength and knowledge tie strength were almost uncorrelated, so working with distant colleagues did not by itself lead to unusual combinations of ideas[1].

Share of genetic-editing papers based on weak ties, by type of tie and period

Approximate share of papers.



Source: Wu et al. · Release date: 2026 · Region: Worldwide · Papers analyzed: 56,847 · Period: 1950 to 2014

Citations versus disruption

Weak and strong ties pay off in different ways. Citation impact rose with tie strength up to a moderate, arm's-length level and fell beyond it, for both collaboration and knowledge combinations[1]. Unusual knowledge combinations had the greatest citation impact when collaboration ties were also weak[1].

Disruption followed the opposite pattern. Papers that disrupted their field came mainly from strong collaboration ties and conventional knowledge combinations[1]. In firms, the structure of collaboration matters: among 124 U.S. semiconductor firms with 80,129 patents, collaboration networks in which inventors of different standing worked together produced more breakthrough patents, especially when the firm's knowledge base was not redundant[2].

What weak and strong ties deliver in science and patents

Classification of the studies' findings.



Sources: Wu et al.; Lin et al. · Release dates: 2024 to 2026 · Region: Worldwide; United States · Classification: Eventamin

Collaboration and productivity: Nobel laureates

Breadth pays through collaboration. Among 440 Nobel laureates in physics, chemistry and medicine, those active in more research areas collaborated more and with more diverse partners, and collaboration in turn raised their output[5].

Laureates averaged around 93 collaborations and 92 articles in the 30 years before their prize[5].

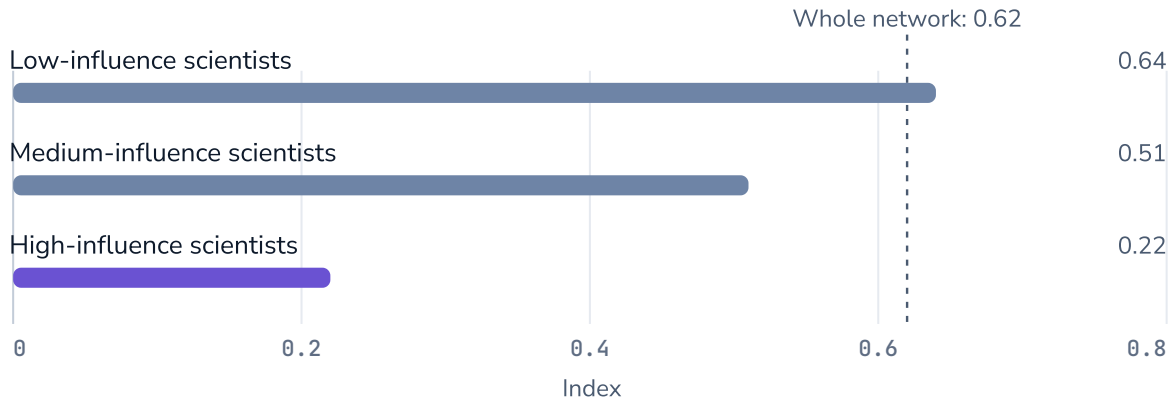
Heavy reliance on external knowledge weakened the link between breadth and collaboration[5].

Scientists collaborate with their kind

Co-authors tend to match in innovativeness. Across 410,501 management-science articles by 393,197 authors, the index of innovation similarity between collaborators was 0.62, a strong tendency, and stayed between 0.60 and 0.66 from 1985 to 2015[3]. The tendency was strong among scientists of low and medium influence but weak among the most influential, and low in collaborations across subgroups[3].

Innovation similarity between co-authors in management science, by influence of the scientist

Index from 0 to 1; higher = stronger tendency to collaborate with similar innovators.



Source: Li et al. · Release date: 2025 · Region: Worldwide · Articles analyzed: 410,501 · Period: 1985 to 2015

Notes on the data

The figures are based on four studies published between 2024 and 2026: an analysis of 56,847 genetic-editing papers and the collaboration networks of 161,870 authors, a panel of 80,129 patents of 124 U.S. semiconductor firms,

publication records of 440 Nobel laureates, and a network analysis of 410,501 management-science articles[1–3,5]. Tie strength, disruption and similarity are measured by the studies' own indices. Shares of weak ties are approximate readings of the study's figures. All results are correlational. The grid is Eventamin's classification of the findings.

Sources

● Study ○ Industry source

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The evidence

5 studies

SAMPLE

Four studies: 56,847 genetic-editing papers from 1950 to 2014, 80,129 patents of 124 U.S. semiconductor firms, publication records of 440 Nobel laureates and 410,501 management-science articles

YEARS

2024–2026

METHOD

Large-scale analyses of publication and patent networks

About Eventamin

Eventamin reads the peer-reviewed research on events, exhibitions and hospitality, sets it against industry data and states what it means for the market. Every brief is published by Eventamin as an organisation: its sources, method and corrections are open.

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