

## Invention Processes and Knowledge Recombination across Technological Boundaries

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### Abstract:

Research on learning and innovation suggests that the ability to engage in distant technological search is of particular importance for sustaining the firm's competitiveness. While extant research primarily focuses on organizational-level mechanisms as a means to facilitate distant searches, the present study contributes to the literature investigating individual-level factors in knowledge recombination. Analyzing a unique data set that combines information from 35,764 European patents with matched survey data obtained from 2,216 inventors, we investigate how the inventor's education and work experience, knowledge sourcing practices and collaborators affect the breadth of technological recombination. Most importantly, our findings indicate that the breadth of technological recombination significantly depends on the particular types of knowledge sources accessed by inventors - whereas some facilitate distant searches and knowledge recombination across boundaries (such as accessing university research and the scientific literature), others tend to constrain inventive behavior and can lead to narrow innovations (such as knowledge sourced from competing firms). Furthermore, our results complement research on star scientists. The 'recombination stars' identified in this paper have a superior track record in knowledge recombination across technological domains, yet they would go unnoticed when applying established output-based approaches for identifying star scientists.

Keywords: inventors, exploration, recombinant search, distant search, patents, patent classes, innovation