Simonton, D. K. (2004). *Creativity in Science: Chance, Logic, Genius, and Zeitgeist*. Cambridge, UK; New York, NY: Cambridge University Press.

Uzzi, B., Mukherjee, S., Stringer, M., & Jones, B. (2013). Atypical combinations and scientific impact. *Science, 342*(6157), 468-472. doi: 10.1126/science.1240474

Verhoeven, D., Bakker, J., & Veugelers, R. (in press). Measuring Technological Novelty with patent based indicators. *Research Policy*.

Walsh, D. (2013). Not Safe for Funding: The N.S.F. and the Economics of Science. *The New Yorker*. Retrieved April 29, 2015, from http://www.newyorker.com/tech/elements/not-safe-for-funding-the-n-s-f-and-the-economics-of-science

Wang, J. (2013). Citation time window choice for research impact evaluation. *Scientometrics, 94*(3), 851-872. doi: 10.1007/s11192-012-0775-9

- Correspondingly, the difficulty of combining J_1 and J_2 is: $1 - \mathrm{COS}_{1,2}$.

- For each paper, we construct a continuous indicator of combinatorial novelty as the sum of all new combinations weighted by the cosine-based ease of making the new combination. Papers without new combinations get 0 by definition.

$$Novelty = \sum_{J_i - J_j \; pair \; is \; new} \left(1 - COS_{i,j}\right)$$

- To avoid trivial combinations, we focus only on the most important journal combinations, i.e., we exclude 50 percent of the least cited journals (as measured in the preceding three years). To further reduce the likelihood of picking up trivial combinations, we impose as a condition that the new combination has to be reused at least once in the next three years. We check the robustness of the main results to these choices in *Appendix II & III*.

Appendix II. Robustness: Scientific fields

The inclusion of scientific field dummies in the econometric analysis corrects for field specific effects influencing impact but does not allow for any field specificity in the relationship between novelty and impact. For example, are novel papers more likely to lead to big gains in some fields, while other fields are more averse to novel papers, hampering their impact?

To examine this in more detail we perform an analysis of the main effects of novelty by scientific discipline. We use 3 groups: LS (Life Sciences), PSE (Physical Sciences and Engineering), and SS (Social Sciences). In LS, we distinguish LS2 (Medicine) from the rest (LS1). In PSE we distinguish PSE2 (Computer Sciences; Engineering) from the rest. Both LS2 and PSE2 are the more applied counterparts of LS1 and PSE1. PSE2 and especially SS are relatively small fields compared with LS1, LS2 and PSE1, which may hamper significant effects for these fields.

The results, available on request from the authors, show that the finding that novel papers are less likely to be published in high impact journals holds especially in LS1, LS2, and PSE1. But in PSE2 and SS, the negative association between novel paper and the Journal Impact Factor is insignificant. The result on the higher dispersion of citations for novel papers holds for all subfields, with the exception of the SS, where there is no significant difference in the dispersion of impact for novel and non-novel papers. In all subfields, highly novel papers are more likely to be top 1% cited papers when using the long citation time window. When using a shorter (3-year) citation time window, and not controlling for the Journal Impact Factor, in none of the scientific fields are novel papers significantly more likely to be top 1% highly cited. Only when controlling for the Journal Impact Factor is there a significant positive effect for highly novel papers, but only in LS1 and PSE1.

We conclude that the main results are more or less robust by field, especially for the larger fields LS and PSE. The result on the higher variance in impact for novel papers and the higher likelihood to be top 1% cited with a longer time window are robust across all fields. The effect of the lower Journal Impact Factor is less robust in the smaller fields.