

Novelty & Reporting Bias in Economics

Valon Kadriu

University of Kassel & INCHER

Department of Economics

kadriu@uni-kassel.de



U N I K A S S E L
V E R S I T Ä T

Motivation

Patterns of dissertation dissemination: publication-based outcomes of doctoral theses in the social sciences

Anastasiya-Mariya Asanov¹  · Igor Asanov¹  · Guido Buenstorf¹  · Valon Kadriu¹  · Pia Schoch¹ 

Received: 28 August 2023 / Accepted: 18 January 2024 / Published online: 29 February 2024
© The Author(s) 2024

Asanov, Anastasiya-Mariya; Asanov, Igor; Buenstorf, Guido; Kadriu, Valon; Schoch, Pia

Working Paper

The Origins of Reporting Bias: Selective but Unbiased Reporting by Early-Career Researchers?

I4R Discussion Paper Series, No. 225

Provided in Cooperation with:
The Institute for Replication (I4R)

Motivation

 OPEN ACCESS

ESSAY

Why Most Published Research Findings Are False

John P. A. Ioannidis

Published: August 30, 2005 • <https://doi.org/10.1371/journal.pmed.0020124>

Motivation

OPEN ACCESS

ESSAY

Why Most Published Research Findings Are False

John P. A. Ioannidis

Published: August 30, 2005 • <https://doi.org/10.1371/journal.pmed.0020124>

OPEN ACCESS

Scooped! Estimating Rewards for Priority in Science

Ryan Hill and Carolyn Stein

PDF PDF PLUS Abstract Full Text Supplemental Material

Abstract

The scientific community assigns credit or "priority" to individuals who publish an important discovery first. We examine the impact of losing a priority race (colloquially known as getting "scooped") on publication and career outcomes. To do so, we analyze data from structural biology where the nature of the scientific process together with the Protein Data Bank enables us to identify priority races and their outcomes. We find that scooped teams are less likely to publish in top journals and receive 21 percent fewer citations. We further study the implications of priority racing on research strategy, academic inequality, and scientist beliefs.



Journal of Political Economy
Volume 133, Number 3
March 2025

Hypotheses

H1: The extent of Novelty changed over time.

H2: The extent of Reporting Bias changed over time.

H3: Novelty is positively associated with Reporting Bias

Outcomes:

- ① Novelty
- ② Statistical Significance

Reporting Bias in Social Sciences

Journal-side:

- Favoring manuscripts with statistically significant results (**publication bias**)

Author-side:

- Specification searching (***p*-hacking**)

- This leads to an inflation of statistically significant results in the literature (Gerber and Malhotra, 2008b,a; Bruns et al., 2019; Franco et al., 2014; Brodeur et al., 2020)

👉 Not ideal, if we assume that this is the basis of policy makers' decisions

Novelty in General



Novelty in Economics

- Behavioral Economics
- Experimental Economics
- Big Data Analyses
- and more...

How Novelty is Measured

- ① Bibliographic-based Novelty (Uzzi et al., 2013; Wang et al., 2017)
 - Recombination of existing knowledge
 - Consider journal-pairs in Reference List of papers
- ② Text-based Novelty (Arts et al., 2025)
 - Measure novelty by comparing Title + Abstract of focal paper to previously published papers

Recombination of Existing Knowledge (Uzzi et al., 2013)

Journal Pairs	Observed	Expected	Z-score
Tetrahedron - Tetrahedron	5071	151.89	637.77
Experientia - Experientia	1159	109.59	95.07
Tetrahedron - Experientia	454	256.06	21.55
Experientia - Tetrahedron	661	481.07	6.88
Z-score of Zero means obs is as likely as chance			0.0
Chem Phar Bull - Life Sci	114	151.19	-2.4
Life Sci - R J Royal Neth C	16	45.45	-4.82
Life Sci - Tetrahedron	36	315.78	-17.67
Life Sci - J Organic Chemistry	166	813.72	-24.21
J Am Chem Soc - Life Sci	469	3147.65	-45.07

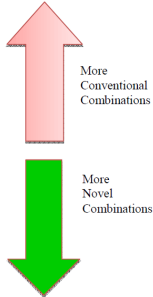


Figure: Examples of Journal Pair Frequencies for Illustrative Paper - Uzzi et al. (2013)

Natural Language Processing (Arts et al., 2025)

Text-based Novelty

- OpenAlex database
- Make use of Titles and Abstracts to identify novel ideas (focal paper is compared to all prior papers)
- Novelty measured based on 1) new words, 2) new phrases, 3) new word combinations, 4) new phrase combinations, and 5) semantic distance
- Validation of this method through Nobel Prize papers and Literature Reviews

Explicit Novelty Example - New Phrases

Paper Citation	Paper Title	Phrase
Levy-Yeyati & Sturzenegger (2003)	To float or to fix: Evidence on the impact of exchange rate regimes on growth	endogeneity_correction
Edlund & Kopczuk (2009)	Women, wealth, and mobility	dynastic_wealth
Gomes et al. (2009)	Durability of output and expected stock returns	countercyclical_risk_premium
Svensson (2003)	Who must pay bribes and how much? Evidence from a cross section of firms	bribe-payee_firm

Data Collection

- Article-data from the *American Economic Review*, *Journal of Political Economy*, and *Quarterly Journal of Economics*
 - AER: 2001 - 2009
 - JPE: 2002 - 2010
 - QJE: 2002 - 2009
- Starting point was data from Brodeur et al. (2016)
 - Extension of the data provided by Katarina Zigova and Thomas Hinz, following the same steps as Brodeur et al. (2016)
 - Data includes:
 - Test Statistics, Field, Author Count, Type of Analysis, etc.



Link novelty and test statistics datasets

Data Summary - Summary Table by Journal

Journal:	# Articles	% of all Articles	# Tests	% of all Tests
All	728	100%	41,727	100%
AER	369	50.69%	19,312	46.28%
JPE	150	20.60%	9,595	22.99%
QJE	209	28.71%	12,820	30.72%

Data Summary - Summary Table by Variable

Controls Summary

Variables	Mean	Std. Dev.	Min	Max
Novelty				
New Word	0.06	0.29	0	5
New Word Combinations	14.29	68.58	0	857
New Phrase	0.43	0.93	0	10
New Phrase Combinations	6.21	14.99	0	194
Semantic Distance	0.17	0.04	0.03	0.36
Atypicality	105.78	139.94	-10.75	3826.88
Significance				
Significant at 10%	0.56	0.50	0	1
Significant at 5%	0.49	0.50	0	1
Significant at 1%	0.36	0.48	0	1

Hypothesis 1

H1: The extent of Novelty changed over time.

Regression 1 - Novelty throughout Time

$$\text{Novelty}_{jkt} = f(\beta_0 + \beta_{\text{Year}} \cdot \text{Year}_{jkt} + X_{jkt} + \varepsilon_{jkt}) \quad (1)$$

- j = article; k = journal; t = year
- **Outcome Variables**
 - Novelty Measures
- **Explanatory Variable of Interest**
 - Publication Year
- **Control Variables**

Novelty throughout Time

	Outcome Variable					
	New Word (1)	New Word Combinations (2)	New Phrase (3)	New Phrase Combinations (4)	Semantic Distance (5)	Atypicality (6)
Year	0.046 (0.143)	0.012 (0.068)	−0.058 (0.045)	0.010 (0.042)	0.000 (0.001)	8.734 (5.852)
Intercept	−112.252 (285.806)	−20.996 (135.942)	100.127 (89.354)	−17.973 (85.244)	−0.464 (1.717)	−17296.468 (11558.499)
Controls	✓	✓	✓	✓	✓	✓
Journal FE	✓	✓	✓	✓	✓	✓
Field FE	✓	✓	✓	✓	✓	✓
Pseudo R ²	0.723	0.996	0.930	0.994	—	—
R ²	—	—	—	—	0.230	0.159
Observations	41, 727	41, 727	41, 727	41, 727	41, 727	35, 304

Notes: Regressions results with the outcome variable being the corresponding novelty indicator and the main explanatory variable of interest being the publication year of the paper. Models 1-4 are Poisson regressions, while 5-6 are OLS regressions. Control variables were selected using post-double lasso Belloni et al. (2014). Variables with at least 20 percent missing values were not considered. Journal and Field FE were kept fixed throughout. Imprecisely reported test statistics were removed following Kranz and Pütz (2022). The inverse of the number of test statistics per article was considered for weighting. Standard errors are clustered at the article level. * indicates significance at 10 percent, ** indicates significance at 5 percent, and *** indicates significance at 1 percent.

Hypothesis 2

H2: The extent of Reporting Bias changed over time.

Reporting Bias throughout Time

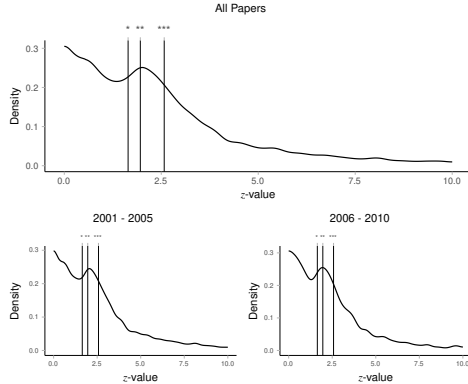


Figure: Reporting bias over time.

Regression 2 - Reporting Bias throughout Time

$$\text{Significant}_{ijkt} = f(\beta_0 + \beta_{\text{Year}} \cdot \text{Year}_{ijkt} + X_{ijkt} + \varepsilon_{ijkt}) \quad (2)$$

- i = test statistic; j = article; k = journal; t = year
- **Outcome Variables**
 - Statistical Significance
- **Explanatory Variable of Interest**
 - Publication Year
- **Control Variables**

Reporting Bias throughout Time

	Outcome Variable					
	Significant at 10%		Significant at 5%		Significant at 1%	
Year	−0.005 (0.004)	0.003 (0.007)	−0.006 (0.005)	−0.003 (0.006)	−0.006 (0.005)	−0.001 (0.008)
Intercept	10.729 (8.819)	−6.208 (13.053)	12.960 (9.334)	5.914 (12.335)	13.569 (10.056)	1.786 (15.263)
Caliper	—	±0.300	—	±0.300	—	±0.300
Interval	—	$z \in [1.345, 1.945]$	—	$z \in [1.659, 2.260]$	—	$z \in [2.276, 2.876]$
Controls	✓	✓	✓	✓	✓	✓
Journal FE	✓	✓	✓	✓	✓	✓
Field FE	✓	✓	✓	✓	✓	✓
R ²	0.049	0.014	0.058	0.011	0.071	0.024
Observations	41, 727	5, 513	41, 727	5, 676	41, 727	4, 588

Notes: OLS regressions results with the outcome variable being an indicator variable for statistical significance at 10 percent (Models 1 and 2), 5 percent (Models 3 and 4), and 1 percent (Models 5 and 6). The main explanatory variable of interest is the publication year of the paper. Control variables were selected using post-double lasso Belloni et al. (2014). Variables with at least 20 percent missing values were not considered. Journal and Field FE were kept fixed throughout. Imprecisely reported test statistics were removed following Kranz and Pütz (2022). The inverse of the number of test statistics per article was considered for weighting. Standard errors are clustered at the article level. * indicates significance at 10 percent, ** indicates significance at 5 percent, and *** indicates significance at 1 percent.

Hypothesis 3

H3: Novelty is positively associated with Reporting Bias

Regression 3 - Reporting Bias & Novelty

$$\text{Significant}_{ijkt} = f(\beta_0 + \beta_{\text{Novelty}} \cdot \text{Novelty}_{ijkt} + X_{ijkt} + \varepsilon_{ijkt}) \quad (3)$$

- i = test statistic; j = article; k = journal; t = year
- **Outcome Variable**
 - Statistical Significance
- **Explanatory Variable of Interest**
 - Novelty Measures
- **Control Variables**

Reporting Bias & Novelty

Outcome Variable						
Significant at 5 percent						
New Word	−0.0299 (0.0474)					
New Word Comb		−0.0000 (0.0002)				
New Phrase			0.0030 (0.0165)			
New Phrase Comb				0.0007 (0.0010)		
Semantic Distance					0.1465 (0.2987)	
Atypicality						0.0001 (0.0001)
Caliper	±0.300	±0.300	±0.300	±0.300	±0.300	±0.300
Interval	$z \in [1.659, 2.260]$	$z \in [1.659, 2.260]$	$z \in [1.659, 2.260]$	$z \in [1.659, 2.260]$	$z \in [1.659, 2.260]$	$z \in [1.659, 2.260]$
Controls	✓	✓	✓	✓	✓	✓
Journal FE	✓	✓	✓	✓	✓	✓
Field FE	✓	✓	✓	✓	✓	✓
R ²	0.0060	0.0050	0.0078	0.0050	0.0054	0.0081
Observations	5, 676	5, 676	5, 676	5, 676	5, 676	4, 772

Notes: OLS regression results with the outcome variable being an indicator variable for statistical significance at 5 percent. The main explanatory variables of interest are the five different novelty measures created by Arts et al. (2025) and the atypicality measure created by Uzzi et al. (2013). Control variables were selected using post-double lasso Belloni et al. (2014). Variables with at least 20 percent missing values were not considered.

Robustness Checks

- Top 3 Econ Journals might not be representative enough
 - Remedy: Use more representative data
 - Solution: Use data from Asanov et al. (2025)
 - Random Sample of German dissertations
 - Follow-Up Articles of these dissertations
 - 👉 Null results stay robust
- Null results also stay robust for 1%, 10% and different calipers

Conclusion

Key Findings

- No systematic change over time in either the level of novelty or reporting bias.
- No association between novelty and reporting bias.

Implications

- The pressure to publish novel findings may not systematically distort empirical reporting.
- Being novel might already be enough (Teplitskiy et al., 2022).

Outlook

Future Agenda

- (Heterogeneity)
- Type of Novelty (Methodological vs. Topical)
- Levels of Novelty?

Limitations

- Data time frame might be too short (2001-2010)
- No causal claims

Thank You!

- Arts, S., Melluso, N., and Veugelers, R. (2025). Beyond citations: Measuring novel scientific ideas and their impact in publication text. *Review of Economics and Statistics*, pages 1–33.
- Asanov, A.-M., Asanov, I., Buenstorf, G., Kadriu, V., and Schoch, P. (2025). The origins of reporting bias: Selective but unbiased reporting by early-career researchers? Technical report, I4R Discussion Paper Series.
- Belloni, A., Chernozhukov, V., and Hansen, C. (2014). Inference on treatment effects after selection among high-dimensional controls. *Review of Economic Studies*, 81(2):608–650.
- Brodeur, A., Cook, N., and Heyes, A. (2020). Methods matter: P-hacking and publication bias in causal analysis in economics. *American Economic Review*, 110(11):3634–3660.
- Brodeur, A., Lé, M., Sangnier, M., and Zylberberg, Y. (2016). Star wars: The empirics strike back. *American Economic Journal: Applied Economics*, 8(1):1–32.
- Bruns, S. B., Asanov, I., Bode, R., Dunger, M., Funk, C., Hassan, S. M., Hauschildt, J., Heinisch, D., Kempa, K., König, J., et al. (2019). Reporting errors and biases in published empirical findings: Evidence from innovation research. *Research Policy*, 48(9):103796.
- Franco, A., Malhotra, N., and Simonovits, G. (2014). Publication bias in the social sciences: Unlocking the file drawer. *Science*, 345(6203):1502–1505.

- ① Consider all pairwise combinations of a paper's reference list (focus on journals)
- ② Count the aggregate frequency of each journal pairing for all referenced pairs from a given publication year
- ③ Compare to a frequency distribution that would have occurred by chance
- ④ Calculate z-score for each journal-pair relative to what was expected by chance
 - Based on this, calculate:
 - Median z-score for each paper
 - 10th percentile z-score

Recombination of Existing Knowledge (Uzzi et al., 2013) - Stylized Example

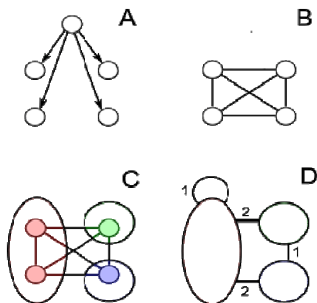


Figure: Uzzi et al. (2013)

- A Focal paper cites four papers.
- B Undirected co-citation links between four articles. Four papers, so six co-citation links.
- C Papers grouped by journal. Each color/oval shape represents one journal.
- D Co-citations linked to journal-level. Total number of paper-to-paper co-citation links (six) is preserved at the journal-level.

Bibliographic-based Novelty

- Count occurrence of each journal-pair in any article in a specific year
- E.g. journal-pair "Tetrahedron-Experientia"
 - If journal-pair appears in 500 articles published in 1980 → Value for "Tetrahedron-Experientia" = 500 for 1980

Natural Language Processing (Arts et al., 2025) - Illustrative Example

Prize	Short Prize Motivation	Paper	New word (phrase) or new combination of words (phrases)
Chemistry 1934	Discovery of heavy hydrogen	Urey, Harold C., Ferdinand G. Brickwedde, and George M. Murphy, "A Hydrogen Isotope of Mass 2," <i>Physical Review</i> 39:1 (1932), 164.	hydrogen_isotope (4,074)
Physics 1936	Discovery of the positron	Anderson, Carl D., "The Positive Electron," <i>Physical Review</i> 43:6 (1933), 491.	positron (94,146)
Medicine 1952	Discovery of streptomycin, the first antibiotic effective against tuberculosis	Schatz, Albert, Elizabeth Bugle, and Selman A. Waksman, "Streptomycin, a Substance Exhibiting Antibiotic Activity Against Gram-Positive and Gram-Negative Bacteria," <i>Proceedings of the Society for Experimental Biology and Medicine</i> 55:1 (1944), 66–69.	streptomycin (23,334)
Physics 1956	Researches on semiconductors and discovery of the transistor effect	Bardeen, John, and Walter H. Brattain, "The Transistor, a Semi-Conductor Triode," <i>Physical Review</i> 74:2 (1948), 230.	transistor (152,047)
Physics 1959	Discovery of the antiproton	Chamberlain, Owen, Emilio Segrè, Clyde Wiegand, and Thomas Ypsilantis, "Observation of Antiprotons," <i>Physical Review</i> 100:3 (1955), 947.	antiproton (5,023)

Figure: Examples of new words/phrases - Arts et al. (2025)

Table: Summary Table by Variables (Controls)

Variables	Mean	Std. Dev.	Min	Max
Controls				
Number of Authors	2.18	0.89	1	5
Citations	574	730.08	1	6210
Model	0.25	0.43	0	1
Data Available	0.26	0.44	0	1
Code Available	0.23	0.42	0	1
Research Assistants	1.60	2.61	0	21
Eye Catchers	0.49	0.5	0	1
Main Result	0.78	0.41	0	1
Observations by Article	162.99	133.78	1	789
Observations by Table	34.75	28.8	1	199
Tables by Article	6.62	4.37	0	23
Number of Decimals	2.55	1.83	0	16
Number of Significant Digits	2.61	1.84	0	16